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Corporate Climate Responsibility Monitor 2024

ASSESSING THE TRANSPARENCY AND INTEGRITY OF COMPANIES' EMISSION REDUCTION AND NET-ZERO TARGETS

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Summary

About the Corporate Climate Responsibility Monitor

The *2024 Corporate Climate Responsibility Monitor* (CCRM) analyses the climate strategies of 51 major global companies, critically assessing the extent to which they demonstrate corporate climate leadership. We evaluate the integrity of climate pledges against good practice criteria to identify examples for replication and highlight areas where improvement is needed.

Section A of this report includes references to different company sample sizes:

- **20 companies:** The 2024 CCRM includes in-depth analyses of 20 companies across four focus sectors: automotive manufacturers, electric utilities, fashion, and food and agriculture (Section B).
- **51 companies:** For our aggregated analysis in Section A, we have also updated our assessments of the 2030 and net-zero targets for all other 31 companies covered in the 2022 and 2023 iterations of the CCRM. The 51 companies reported combined revenues of USD 6.1 trillion in 2022. Their total self-reported GHG emission footprint in 2022, including upstream and downstream emissions (scope 3) that may include a marginal degree of overlap, amounts to approximately 8.8 $GtCO_2e$. This is equivalent to roughly 16% of global GHG emissions in 2022.
- **28 companies:** 28 of the 51 companies analysed in detail by the 2022, 2023 and 2024 iterations of the CCRM are covered by the four focus sectors of this report: automotive manufacturers, electric utilities, fashion, and food and agriculture. The 28 companies from these four sectors are sometimes considered in more detail in Section A of this report.

The first iteration of the CCRM, published in February 2022, exposed the ambiguity and insufficiency of corporate climate strategies. The report found that major companies' net-zero targets were mostly ambiguous and lacked commitments to reducing emissions. The collective ambition of companies to reduce emissions by 2030 fell far short of the requirements to be aligned with 1.5°C compatible pathways.

Since 2022, we have seen several significant developments aimed at improving the system, including the published recommendations of the UN High-Level Expert Group (HLEG), updates to International Organization for Standardization's (ISO) standards, introduction of new Science Based Targets initiative's (SBTi) standards, implementation of new regulations in some jurisdictions, and the emergence of innovative good practices for certain areas. Amid these developments, the 2024 CCRM examines what has changed in the quality of companies' climate strategies, what examples of leadership are emerging and which sticking points persist.

Companies' climate targets are gradually improving yet still mostly insufficient and unsubstantiated, amid a looming threat of backsliding.

Key insights

The collective ambition of companies' 2030 and net-zero climate targets has gradually improved over the last two years. However, most companies continue to fall short of the economy-wide emission reductions required to limit global warming to below 1.5°C. (Section 1.1)

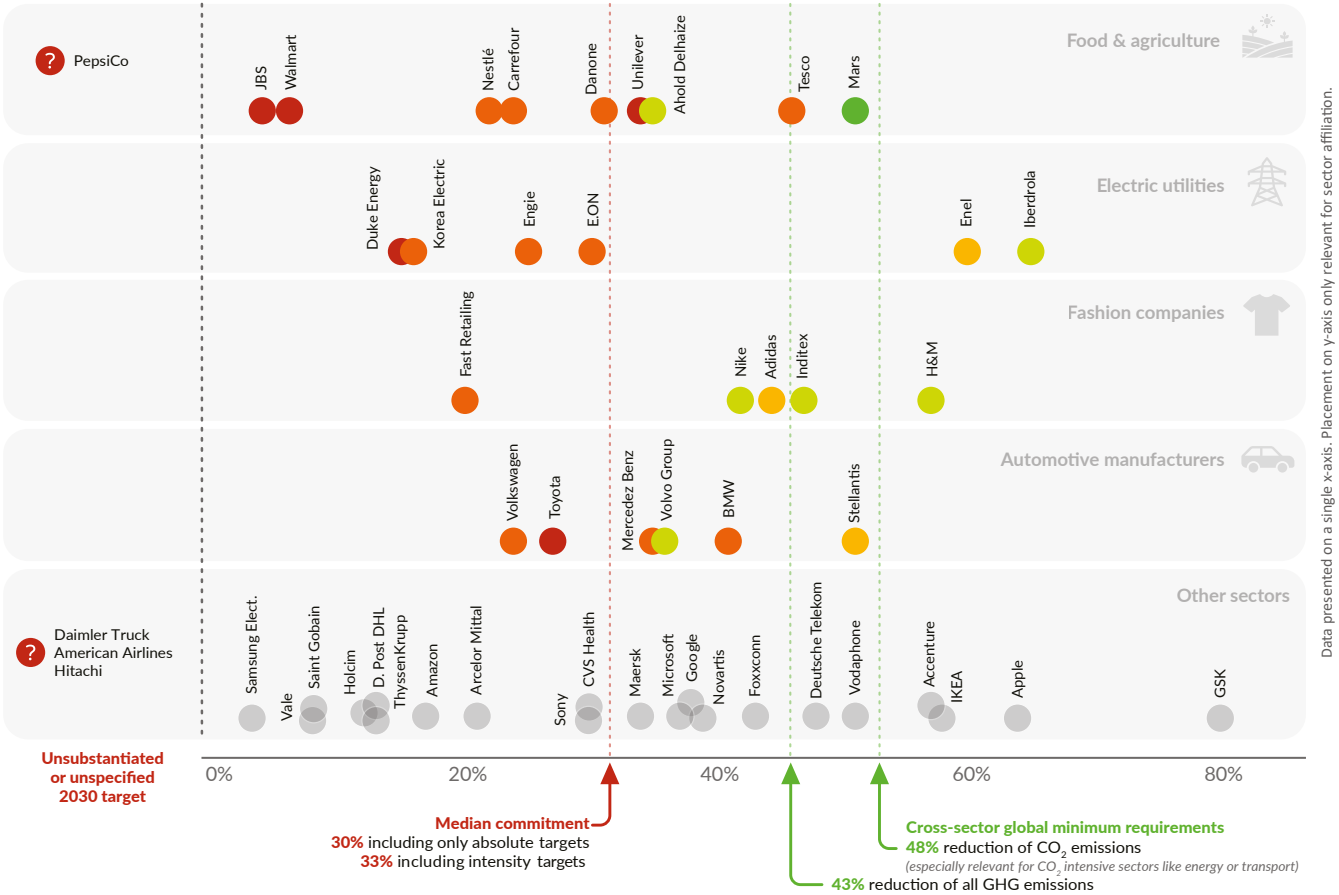
The 2030 climate targets of 51 major companies translate to a median absolute emission reduction commitment of just 30% of the full value chain emissions between 2019 and 2030. This may increase to 33% under the most optimistic scenario that emission intensity targets translate to equivalent absolute emission reductions *(see Figure S1)*. This represents modest progress in companies' mitigation ambition towards 2030, with 19 out of 51 companies having made updates of varying significance to their 2030 climate pledges over the last two years.

An increasing number of companies also substantiate their long-term net-zero targets in line with guidance from HLEG, ISO and SBTi. More than half of the major companies we have assessed (29 out of 51) explicitly commit to emission reduction targets alongside their net-zero pledges. Of these 29 companies, 18 commit to deep decarbonisation along their value chain by aiming for close to a 90% reduction, partially aligning with 1.5°C-compatible decarbonisation milestones.

While this represents tangible progress compared to the widespread ambiguity of corporate net-zero targets that we identified in the 2022 CCRM, companies' targets are collectively still critically insufficient to be aligned with a 1.5°C pathway. The average commitment to 30% emission reductions by 2030 falls short of the need to decrease global GHG and CO_2 emissions by around 43% and 48% respectively between 2019 and 2030 (IPCC, 2022). Most companies continue to present 2030 and net-zero targets that are either ambiguous or only commit to limited emission reductions. Often, targets cannot be taken at face value as companies leave out certain emission sources, use non-harmonised base years, do not report updated base year emissions, or do not provide contextualising information to understand what the targets mean in absolute terms, among other issues.

Fig S1: The median commitment to emission reductions between 2019 and 2030 is 30-33%

This chart shows the proportion of full value chain GHG emissions that companies commit to reduce between 2019 and 2030. Data includes 51 companies. 4 companies without clear commitments for 2030 are not included.



Integrity rating: High | Reasonable | Moderate | Poor | Very poor

The colour of the data points represents our assessment of the integrity of company's 2030 targets, based on their sufficiency compared to sector-specific 1.5 °C aligned benchmarks, and the appropriateness of the terminology used in the pledge communication.

Note: The data in this chart represents the authors' interpretation of companies' emission reduction commitments, based on publicly available information. Targets that are reliant on offsets to an undefined extent are marked as ambiguous. See Section B and Annex III for further details and explanations on individual company cases. The median calculation that includes emission intensity targets represents the most optimistic scenario that emission intensity targets result in equaivalent absolute emission reductions.

Proposals for introducing flexibility mechanisms for scope 3 emission reduction targets are gaining momentum, although this would entail backsliding on already insufficient commitments, in many cases nullifying companies' current targets. (Section 1.2)

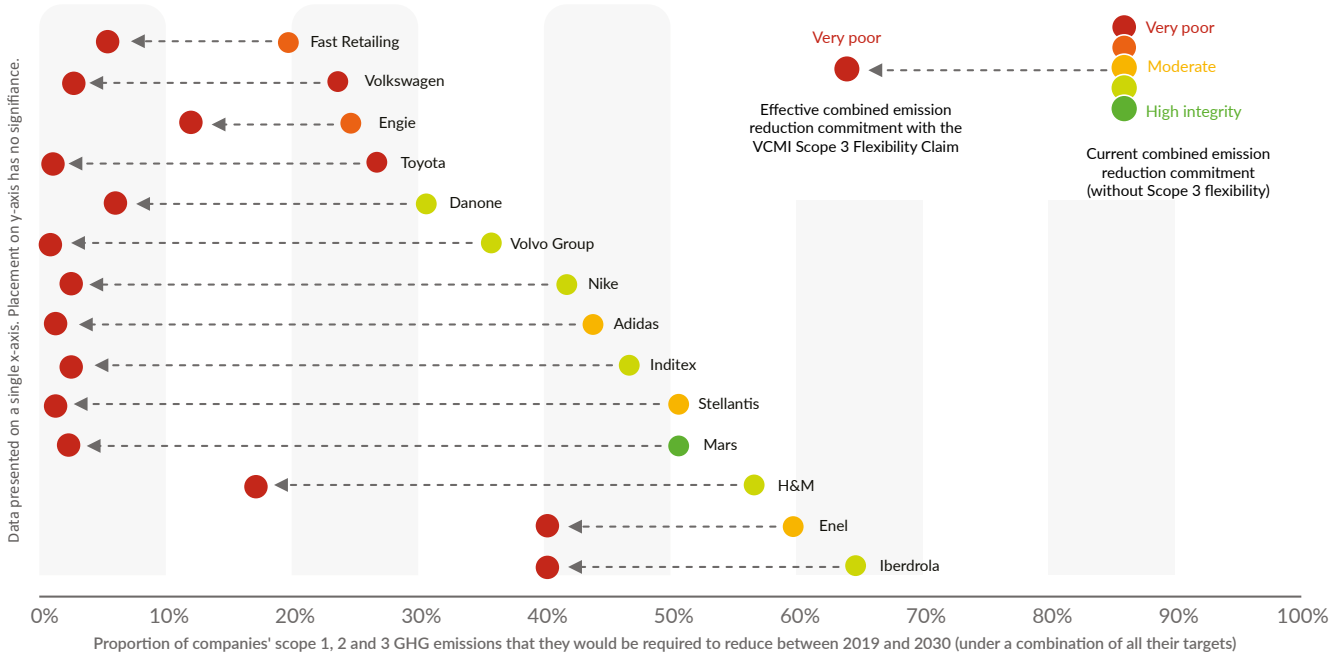
In contradiction to the key recommendations of the *Integrity Matters* report by HLEG, which calls for no offsetting towards the achievement of interim targets (UN HLEG, 2022), the Voluntary Carbon Markets Integrity Initiative's (VCMI) beta Scope 3 Flexibility Claim would allow companies to purchase carbon credits for up to 50% of their annual scope 3 emissions to "bridge the gap" to the scope 3 target trajectory that they are not on track to meet up to 2030 (VCMI, 2023b). The VCMI's beta claim offers a 50% flexibility threshold compared to a company's actual emissions in any given year. In other words, companies can still be eligible if their emissions are *double* the levels that would be implied by the target trajectory in any given year. Of the 14 companies for which we could test the implications of such a flexibility mechanism, 11 would be entitled to the flexibility to even *increase* (8) or plateau (3) their scope 3 emissions between 2019 and 2030, rendering these targets as effectively meaningless. Figure S2 shows that this proposed flexibility mechanism would nullify the scope 3 commitments of most companies and leave them accountable only to their scope 1 and 2 targets.

Any potential link between the VCMI Scope 3 Flexibility Claim and the SBTi target setting guidance remains unclear. At COP28 in December 2023, SBTi joined with VCMI and other initiatives to announce a "framework for end-to-end integrity" aimed at aligning and complementing their guidance, and SBTi is currently in the process of evaluating evidence on the effectiveness of environmental attribute certificates (Manuell, 2023). It remains unclear whether SBTi's position on the use of offsetting towards scope 3 targets could change, and whether the VCMI Scope 3 Flexibility Claim could serve as a basis for any such changes. This would further weaken companies' SBTi scope 3 targets, which in many cases are already insufficient to align with 1.5°C pathways.

Flexibility to offset scope 3 emissions is not the right solution to address the challenges that companies understandably face in implementing targets for emissions that are partly beyond their direct control. Instead, the GHG Protocol and SBTi Net Zero Standard revision processes throughout 2024 are an opportunity to reconsider the categorisation of value chain emissions to focus on the most critical decarbonisation indicators for each sector which are well within companies' direct control.

Part of the rationale for scope 3 flexibility proposals is to increase the flow of voluntary climate finance to climate change mitigation projects worldwide through carbon crediting, but climate contributions (also referred to as Beyond Value Chain Mitigation) can also increase the flow of voluntary climate finance *without* compromising transparency and the requirement to decarbonise a company's own emissions.

Fig S2: The proposed scope 3 flexibility claim would effectively nullify the scope 3 targets of most companies, reducing their 2030 commitments to cover only scope 1 and 2 emissions



Integrity rating: High | Reasonable | Moderate | Poor | Very poor

The colour of the data points represents our assessment of the integrity of company's 2030 targets, based on their sufficiency compared to sector-specific 1.5 °C aligned benchmarks, and the appropriateness of the terminology used in the pledge communication.

Note: Data includes 14 companies, including all companies from the CCRM 2024 sample with SBTi validations and targets that can be broken down to specific scopes. The 14 companies in this figure are only used as examples; we are not aware and do not intend to imply that these companies have indicated an intention to make use of the Scope 3 Flexibility Claim. The data points in this chart represents the authors' interpretation of companies' emission reduction commitments, based on publicly available information. The data points include the following optimistic assumptions: (1) Emission intensity targets are assumed to result in equivalent absolute emission reductions (2) Although most of the companies would be entitled under the VCMI proposal to increase their emissions, the data points show the scenario under which scope 3 emissions remain constant, rather than assuming that they will indeed increase.

The Science Based Targets initiative (SBTi), as the largest and most influential validator of corporate targets and independent assessments, plays a critical role in validating corporate climate pledges. A comparison between the ratings of SBTi and other assessors indicates a significant degree of leniency in the current validation practices and points to multiple areas for improvements. (Section 1.3)

Founded in 2015, the SBTi has developed into the largest and most influential validator of corporate climate targets for 2030 and beyond. Of the 28 companies covered in the four key focus sectors of this analysis, SBTi has validated the 2030 targets of 22 of these companies to be aligned with a pathway to limit global temperature increase to 1.5°C, 'well-below 2°C', or 2°C. Most of these companies prominently highlight their SBTi validations in their climate-related communications to promote targets that are in many cases insufficient in the context of the latest available science.

The comparison between SBTi's validations of 2030 targets and assessments by the CCRM, the Transition Pathways Initiative (TPI), the MSCI Net-Zero Tracker, and the Planet Tracker, indicates that SBTi could implement the following improvements to substantiate and uphold the integrity of their validations:

- ✔ Increase the frequency of the validation cycle for 2030 corporate climate targets to align validations with the latest developments in validation methods and the latest scientific findings.
- ✔ Revise approach and develop methodologies to cover scope 3 emissions related to key relevant emission sources along the value chain in SBTi's target classifications.
- ✔ Remove outdated validations that date back multiple years since their issuance or are based on indefinitely paused methodologies such as for intensity targets for light-duty vehicles in the automotive sector.
- ✔ Refine the SBTi's Forest, Land and Agriculture (FLAG) guidance to specify minimum requirements for the reduction of agricultural emissions, or additional targets for specific agricultural emission sources, alongside carbon dioxide removals.
- ✔ Transparently disclose underlying data and methods for each validation and communicate existing limitations affecting current validations.

The SBTi might face multiple challenges to implement such timely improvements. As a voluntary initiative mostly funded by third parties, the SBTi depends on the voluntary participation of companies and needs to accommodate the perspectives of different stakeholders when developing its validation methodologies. These contextual conditions may explain some of the existing flexibility in the system and might present a bottleneck for SBTi to further develop towards fully science-aligned validations that provide the necessary insights for investors, regulators, courts, and other stakeholders on 1.5°C-aligned climate action.

Mixed progress towards critical sector transitions calls into question the credibility of companies' apparent ambition. (Section 2.1)

Only four companies' emission reduction plans embody the necessary shift from pledges to actual implementation. For instance, **Danone** commits to significantly reduce methane emissions from fresh milk until 2030 and to increase the share of plant-based products. **Enel** and **Iberdrola** have increased the installed capacity of renewables, especially solar and wind, and plan to further ramp this up in the near future. **Volvo Group** invests in zero-emission vehicles, charging infrastructure and low-carbon steel and aluminium.

Whereas we see some promising examples among the automotive manufacturers, electric utilities and food and agriculture companies, none of the five fashion companies present convincing emission reduction plans, raising concerns about the feasibility of the companies' ambitious 2030 targets. The fashion companies implement measures to increase renewable electricity use in the supply chain, but also encourage suppliers to switch to biomass or natural gas, which are not credible decarbonisation options. None of the five companies commit to reducing overproduction or moving away from the fast fashion business model.

Many companies continue to rely on false solutions such as Carbon Capture, Utilisation and Storage (CCUS) standalone Renewable Energy Certificates (RECs), bioenergy and carbon dioxide removals as an alternative to emission reductions. (Sections 2 and 3)

We identify over-reliance on the following contentious solutions and recommendations to mitigate them:

⚠ CCUS and 'transitional fuels' as an alternative to fossil fuel phase-out (Section 3.1)

Despite being one of the main levers to reduce emissions in the power, automotive, and fashion sectors, only a minority of the companies assessed in our analysis commit to a fossil fuel phase-out. A phase-out of coal and fossil gas is particularly crucial in the energy sector, as this is a prerequisite for the decarbonisation of other high-emitting sectors through electrification. Most electric utilities assessed in our analysis address the need to exit coal, but fossil gas is still seen as a 'transitional fuel', especially outside Europe. The automotive sector is lagging in phasing out internal combustion engines. The fashion sector has started to reduce coal from its production processes, but a full commitment is yet to be made. Overall, we find that companies' commitments to phase out fossil fuels depend largely on the regulatory environment at the national and regional level, as the phase-in of alternatives must take place in parallel and requires dedicated incentive schemes.

We recommend that regulators, standard setters, and voluntary initiatives formulate more prescriptive guidelines on the necessity for companies to include fossil fuel phase-out requirements in their transition plans.

⚠ Standalone Renewable Energy Certificates (Section 3.2)

Companies are increasingly reporting renewable electricity targets and higher shares of renewable electricity consumption, but these targets and claims all mean different things and their real impact is often far less than implied. Standalone RECs still play a large role in companies' renewable electricity procurement strategies, but companies demonstrate increasing awareness on the limitations of this approach and many plan to shift towards higher-quality procurement instruments including Power Purchase Agreements. Momentum is also building for hourly matching of renewable electricity, but support and incentives are needed for more companies to adopt this approach. We find that voluntary initiatives and standards currently provide limited incentives for companies to strive for higher-quality renewable electricity strategies. The update process for the GHG Protocol's guidance on Scope 2 emissions accounting is a promising opportunity to realign the standard with transparent and ambitious practices.

We recommend revising the market-based emission accounting method to better differentiate between the highly significant nuances in renewable electricity strategies.

⚠ Bioenergy (Section 3.3)

While over half of the companies assessed consider bioenergy in their decarbonisation plans, bioenergy is not a credible solution for any of them. Particularly in the fashion sector, plans for switching coal to biomass in the supply chain may significantly undermine seemingly ambitious emission reduction targets – and in some cases render them meaningless. Contrary to popular belief, bioenergy is not an emissions-free energy source, and sourcing biomass is likely to have negative impacts on ecosystems and local communities. Companies that consider themselves climate leaders should refrain from using bioenergy and advocate for policy changes in regions where sourcing bioenergy is easier and cheaper than sourcing non-combustible sources of renewable energy.

We recommend that accounting guidance is revised to recognise that bioenergy is not an equal alternative to non-combustible renewables.

Carbon dioxide removals and 'insetting' (Section 3.4)

Carbon dioxide removals are crucial to reach net-zero emissions globally by mid-century. However, companies in the food and agriculture sector are currently counting on land sequestration carbon dioxide removals within their value chain to meet significant portions of their emission reduction targets, sometimes referred to as 'insetting'. Besides major uncertainties around the permanence and potential of land sequestration CDR, the aggregation of removals and emission reductions is hiding a lack of commitment and progress towards the necessary agricultural transitions for reducing emissions from highly challenging sources, such as methane emissions from livestock and nitrous oxide emissions from fertiliser application.

We recommend refining the SBTi's FLAG guidance to specify minimum requirements for the reduction of agricultural emissions or additional targets for specific agricultural emission sources, alongside carbon dioxide removals.

Neutralising residual emissions (Section 3.5)

Companies' reliance on carbon dioxide removals to fulfil their net-zero targets is high, at times reaching up to 50% of their 2019 emissions. Their plans appear to be unrealistic because they rely on excessive volumes of CDR compared to the definition of residual emissions implied by 1.5°C-aligned sector-specific pathways. Furthermore, they mostly rely on land sequestration CDR with a high probability of non-permanence. It is also highly unlikely that the scarce supply of high-quality CDR can match the high demand for CDR. This over-reliance has the potential to jeopardise global net zero, if companies use removals to delay emissions reductions.

We recommend that regulators and corporate guidelines require companies to set three separate targets for emission reductions, land sequestration removals, and technical removals without neutralisation claims.

Companies appear to be moving away from misleading carbon neutrality claims.

Several companies, including Nestlé, Danone, Nike, Stellantis and Volvo Group, appear to have moved away from some of the unsubstantiated carbon neutrality claims that they used to make in the past, thereby improving the transparency of their climate communications. Danone continues to make modest contributions to climate change mitigation beyond its value chain despite moving away from making carbon neutrality claims for its brands (although the company continue to make carbon neutrality claims for its production sites; see below). Google and Microsoft – both of which received a *poor* rating for the integrity of their carbon neutrality claims in the *2023 Corporate Climate Responsibility Monitor* – also appear to be quietly moving away from these claims, even though both companies still appear to procure carbon credits equivalent to their scope 1 and 2 emissions.

Among the 20 companies assessed, only four — Daimler Truck, Danone, Mars, and Volkswagen Group — reported in 2022 or 2023 that certain products or aspects of their businesses were carbon neutral, using carbon credits. We have rated all these claims to be of *very poor* or *unclear* integrity: each claim applies to only a fraction of the respective company's emissions, and none of the companies provide evidence that the carbon credits they procure are of sufficiently high quality to be considered equivalent to reducing the company's own emissions.

In 2024, the EU adopted a ban on climate-neutral advertising on products and services (European Parliament, 2024). This breakthrough legislation marks the first time in the world where policymakers have banned carbon neutrality claims, potentially setting a precedent for similar developments in other countries. During 2023, a wave of European business consultancies and carbon credit sellers – including myclimate, ClimatePartner and South Pole – also announced a transition away from carbon neutrality labels.

The publication of guidelines in 2023 and 2024 constitute concrete steps towards operationalising and mainstreaming climate contributions, but there remains a lack of specificity on the claims that companies can and cannot make based on the contributions they provide. (Section 4.1)

A *climate contribution* refers to finance provided by a company to support climate change action beyond the company's own value chain, without claiming to neutralise its own emissions. Climate contributions can also increase the flow of voluntary climate finance *without* compromising transparency and the requirement to decarbonise a company's own emissions. Despite this, only a small number of the companies in this report are contributing to climate change mitigation beyond their value chains without claiming neutralisation of emissions, and the volumes of support from these companies remain modest.

Several developments in 2023 and 2024 have contributed to moving the climate contribution model from a theoretical concept towards an implementation-ready model. However, undefined details that require further elaboration will determine the extent to which these developments represent a significant step forward or merely a repackaging of old approaches.

- In February 2024, **SBTi** published the outcome of its consultation process on recommendations for companies to engage in beyond value chain mitigation (BVCM) (Benson *et al.*, 2024). The outcome is an operationalisation of the climate contribution approach; companies are recommended to provide finance — based on a carbon price applied to the volume of their own emission footprint — to climate change mitigation efforts outside of the companies' value chain. However, the SBTi report does not rule out the possibility of companies making compensation claims under the BVCM approach, which is a highly relevant omission. If a decision is made to depart from the core principles of SBTi to allow offsetting toward target fulfilment, then the BVCM recommendations could have a substantially different meaning compared to the current situation.
- The **Gold Standard** also published a "*Step by step guidance for organisations taking responsibility for their unabated emissions*" (Gold Standard, 2024), which aligns with SBTi's best practice recommendations on BVCM and is also prescriptive on claims.
- The **Voluntary Carbon Markets Integrity initiative's (VCMI)** "carbon integrity" claims guidance also constitutes a form of climate contribution approach: although exclusively based on carbon credit procurement, companies are recommended not to claim the neutralisation of their emissions through this means (VCMI, 2023a). Despite this potentially positive development, it remains to be seen whether the VCMI carbon integrity claims will be picked up by companies, compared to VCMI's other separate proposed framework: the VCMI's beta Scope 3 Flexibility Claim would allow companies to offset emissions towards their scope 3 targets, posing a major risk to corporate ambition.

In 2024, details on claim terminology and finance recipients need to be clarified. Most importantly, the potential links between these frameworks and any emerging flexibility mechanisms need to be clarified. The claims that companies can make with the contributions that they provide should be specified in clear terms to avoid a new generation of inconsistent and potentially misleading communications. More guidance is needed regarding where and how climate contributions could be channelled. With these details, business consultancies and project developers will be able to follow a clear framework, and more companies will be able to start using this model.

The integrity of the current corporate accountability system is impaired by inherent tensions deriving from a lack of institutional separation and direct corporate influence. We need to evolve from voluntary initiatives to formal accountability. (Section 4.3)

The findings of our analysis show that – while voluntary initiatives play a key role in the corporate climate accountability system – the current over-reliance on voluntary initiatives for many functions of the system does not result in sufficiently credible corporate climate action, despite the increasing urgency of the climate crisis. These pioneering initiatives were formed at a time when corporate climate action was in its early stages. As we have now reached a stage where most of the largest and most influential multinational corporates regularly announce targets and strategies to reduce emissions, the model of voluntary mobilisation may have outgrown its original purpose.

Prompt adjustments to the existing system are needed to establish institutional separation and independence between actors performing the functions of *standard setting*, *validations*, and *mobilisation*.

- ✔ **Institutional separation for key functions of the accountability system** avoids some of the most basic tensions that impair the integrity of the current system. Mobilisation and capacity-building initiatives should be able to engage as many companies as possible, while those setting science-aligned standards should not compromise between companies' interests on the one side and scientific findings on the other side.
- ✔ **Compliance, grievance, and whistle blowing mechanisms must be introduced within existing voluntary initiatives** to accompany this institutional separation.

In parallel to these adjustments of the existing system, the corporate climate accountability system should start to shift from voluntary initiatives to formal accountability including regulation, accredited verification and validation entities, and effective advocacy and litigation.

- **The legally binding nature of regulation contributes to an enforceable accountability system** in which it is no longer voluntary for companies to commit to corporate climate strategies, and in which companies and auditors can be held accountable.
- **The introduction of regulation or international standards will enable target validations and performance verifications by accredited and legally liable entities.** Like traditional financial auditing by accounting firms, entities performing validations and verifications could undergo accreditations by regulators and can be held legally liable in case of negligence. This formalisation can enhance the effectiveness of the advocacy and litigation activities.
- **This necessary shift includes an important role for voluntary initiatives** to scrutinise forthcoming regulations and promote upward convergence to high-ambition standards.

Table 1: Overview of companies assessed in the Corporate Climate Responsibility Monitor 2024 (companies are listed alphabetically within each integrity rating category)

HIGH INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
No companies achieved a high integrity rating				

REASONABLE INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
Enel	Zero emissions in 2040			p. 92
Iberdrola	Net zero emissions before 2040			p. 96

MODERATE INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
Danone	Net zero emissions by 2050			p. 118
H&M Group	Net zero emissions by 2040			p. 108
Inditex	Net zero emissions by 2040			p. 110
Mars	Net zero emissions by 2050			p. 120
Nike	Net zero emissions by 2050			p. 112
Stellantis	Carbon net-zero by 2038			p. 76
Volvo Group	Net zero emissions by 2040			p. 84

LOW INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
Adidas	Carbon neutral by 2050			p. 104
Daimler Truck	CO_2-neutrality by 2050			p. 74
ENGIE	Net zero carbon by 2045			p. 94
Duke Energy	Net zero carbon by 2050			p. 90
Fast Retailing	Carbon neutral by 2050			p. 106
Nestlé	Net zero emissions by 2050			p. 122
Tesco	Net zero emissions by 2050			p. 124
Volkswagen Group	Carbon neutral by 2050			p. 81
Walmart	Zero emissions in operations by 2040			p. 126

VERY LOW INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
KEPCO	Carbon neutrality by 2050			p. 98
Toyota	Carbon neutral by 2050			p. 78

5-point scale High | Reasonable | Moderate | Poor | Very low **. See individual company analyses.**
Assessments were made based on public information identified by the authors. A poor rating may not necessarily be an indication that a company's climate strategy is weak, but could also indicate that the information was insufficient to confirm good practice. Ambitious companies can improve their ratings by ensuring that all aspects of their climate responsibility strategies are transparently and accurately disclosed, and in the public domain.

About the Corporate Climate Responsibility Monitor

The need for scrutiny on corporate climate action

Many companies are putting themselves at the forefront of climate action. Corporate climate pledge setting is becoming standard practice: by February 2024, over 10,000 companies had joined the UNFCCC's Race to Zero campaign (UNFCCC, 2023b), including many of the world's largest companies.

The increasing concern within civil society about the climate crisis is leading to increased pressure from consumers, shareholders, and regulators for companies to decarbonise. In parallel, companies realise that the trajectory towards decarbonising the global economy is firmly established, and it is increasingly attractive for them to assume a leading role in that new paradigm. Many companies are scrambling to adopt new approaches and narratives to demonstrate their climate leadership. However, the rapid acceleration of corporate climate pledge setting, combined with the fragmentation of approaches and the general lack of regulation or oversight, makes it challenging to distinguish real climate leadership from unsubstantiated greenwashing.

The criteria for good practice climate action by companies has shifted with the increasingly clear scientific evidence that underpins the urgency of the climate crisis. With the objectives of the Paris Agreement, greenhouse gas emissions need to be reduced at speed across all countries and sectors. To meet the 1.5°C limit, global greenhouse gases and CO_2 emissions must be reduced by 43% and 48%, respectively, from 2019 levels by 2030. This trajectory aims to reach net-zero global CO_2 emissions by around 2050, followed by net-zero emissions of all greenhouse gases by around 2070 and net-negative emissions thereafter (IPCC, 2022).

Company actions that were considered viable only five years ago are often far from sufficient according to the current state of knowledge. For example, it is no longer sufficient for companies to only address their own direct emissions; rather, companies need to address upstream and downstream emissions as well. It is no longer good practice for a company to offset emissions by reducing or removing emissions elsewhere; rather, emission reductions and removals 'elsewhere' need to be enhanced *in parallel* to the company's emission reductions.

The challenge of distinguishing real climate leadership from greenwashing is significant, but addressing it has the potential to unlock more substantial global climate change mitigation efforts. Corporate climate action is key to closing the emissions gap to align with a 1.5°C pathway. In a short space of time and in the absence of sufficient top-down regulation, consumers' and shareholders' expectations have become a major driver for enhanced corporate climate action. Companies appear to be responding to these expectations. To support this important bottom-up pressure, it is essential that the credibility of companies' strategies is transparent and can be understood by their target audiences.

The Corporate Climate Responsibility Monitor

The *Corporate Climate Responsibility Monitor* evaluates the transparency and integrity of companies' climate pledges with the following objectives:

- ✔ **Identify and highlight good practice approaches** that can be replicated by others, recognising that companies are experimenting to work out what constructive and credible practices are.
- ✔ **Evaluate the transparency and integrity of major companies' climate leadership claims** and provide a structured methodology for others to replicate such an evaluation. **Transparency** refers to the extent to which a company publicly discloses the information necessary to fully understand the integrity of that company's approaches towards the various elements of corporate climate responsibility. **Integrity**, in this context, is a measure of the quality, credibility, and comprehensiveness of those approaches.
- ✔ **Highlight opportunities for enhancing the corporate climate accountability system** based on emerging good practices and issues that we observe.

The *Corporate Climate Responsibility Monitor* focuses on four main areas of corporate climate action: tracking and disclosure of emissions (methodology section 1), setting emission reduction targets (methodology section 2), reducing own emissions (methodology section 3) and taking responsibility for unabated and residual emissions (methodology section 4). Evaluations for 20 major global companies are set out in Section B of this report. Section A analyses aggregate trends drawing on up to 51 detailed company assessments, which includes the companies assessed in section B of this report, as well as those covered in the 2022 and 2023 iterations of the CCRM.

The *Corporate Climate Responsibility Monitor* is prepared by **NewClimate Institute**, with support from **Carbon Market Watch**. The consortium partners combine years of experience with the independent critical analysis of corporate climate action and carbon market mechanisms. NewClimate Institute and Carbon Market Watch are both not-for-profit organisations. Neither institution holds private commercial interests in voluntary carbon credit markets.

Development of the Corporate Climate Responsibility Monitor

The *Corporate Climate Responsibility Monitor* follows the guiding principles for good practice corporate climate responsibility outlined in the accompanying methodology document: *Guidance and assessment criteria for good practice corporate emission reduction and net-zero targets: Version 4.0* (NewClimate Institute, 2023a) We have drawn these guiding principles from a combination of scientific literature review, previous work by the authors, and the identification of existing good practices from company case studies. These guiding principles address issues where the state of scientific knowledge and debate are rapidly evolving. The views expressed in this document reflect the perspectives of the authors, based on our interpretation of existing research and current developments. While these views may not be universally held, we note that version 4.0 of the methodology in 2024 is very closely aligned with the converging guidance of other major initiatives including the UN High Level Expert Group on Net Zero Targets and the ISO Net Zero Guidelines on net zero targets *(see Table 2)*.

The *Corporate Climate Responsibility Monitor* promotes transparency with the philosophy that consumers, shareholders, regulators, and CSOs should be able to follow and assess the integrity of companies' claims. Accordingly, the company assessments in section B are solely based on publicly available information that the authors were able to identify *(see Annex-Data Sources in the Methodology document)*. Each rating represents the authors' understanding of the publicly available information. In some cases, company information was scattered across different sources (e.g., annual reports, press releases and statements, webpages, or other marketing materials); it is possible in this process that information may have been misinterpreted, or that relevant information was overlooked. Companies should consider how to present information as transparently as possible to ensure that observers are able to access all relevant information necessary to understand their climate strategies.

We assess companies primarily based on self-reported information. We do not verify or certify the accuracy of the information provided by companies, including their GHG emission reporting. In specific cases, we supplement the self-reported information with data from other sources, but we cannot guarantee the accuracy of that information.

→ See also the assessment methodology for the Corporate Climate Responsibility Monitor. *Guidance and assessment criteria for good practice corporate emission reduction and net-zero targets: Version 4.0* (NewClimate Institute, 2024).

Good practice overview

Corporates looking to take a position of climate leadership can learn from each other to replicate good practice approaches that are transparent, constructive and robust. The *Corporate Climate Responsibility Monitor 2024* assesses 20 major global companies to identify good practices in four key areas.

- **Tracking and disclosure of emissions:** To develop a comprehensive and robust climate strategy, it is key that companies understand and are transparent about their GHG emission footprints and their trajectories.
- **Setting specific and substantiated targets:** Companies' headline climate change pledges encompass a broad range of target setting approaches. Regardless of the type of target and the terminology used, the commitments should send a clear signal for immediate action to decarbonise the value chain and avoid misleading consumers, shareholders, observers and regulators.
- **Reducing emissions:** Encompassing measures for deep emission reductions is the backbone of ambitious corporate climate targets.
- **Responsibility for unabated and residual emissions:** Corporate climate leadership extends beyond ambitious target setting to include taking responsibility for unabated emissions and avoiding misleading offsetting claims.

Figure 1 provides an overview of good practice corporate climate responsibility and our rating methodology for each of these four areas. Table 2 demonstrates the alignment of this methodology with our major standards and initiatives.

Our assessments include a rating of the transparency and integrity of companies' approaches. **Transparency** refers to the extent to which a company publicly discloses the information necessary to fully understand the integrity of its approaches towards the various elements of corporate climate responsibility. **Integrity**, in this context, measures the quality, credibility and comprehensiveness of those approaches.

Full details on our methodology for assessing good practice across these four areas can be found in the accompanying methodological document: *Guidance and assessment criteria for good practice corporate emission reduction and net-zero targets: Version 4.0* (NewClimate Institute, 2024).

Figure 1: **Overview of Corporate Climate Responsibility Monitor assessment methodology** (and alignment with respective recommendations of HLEG and ISO Net Zero Guidelines)

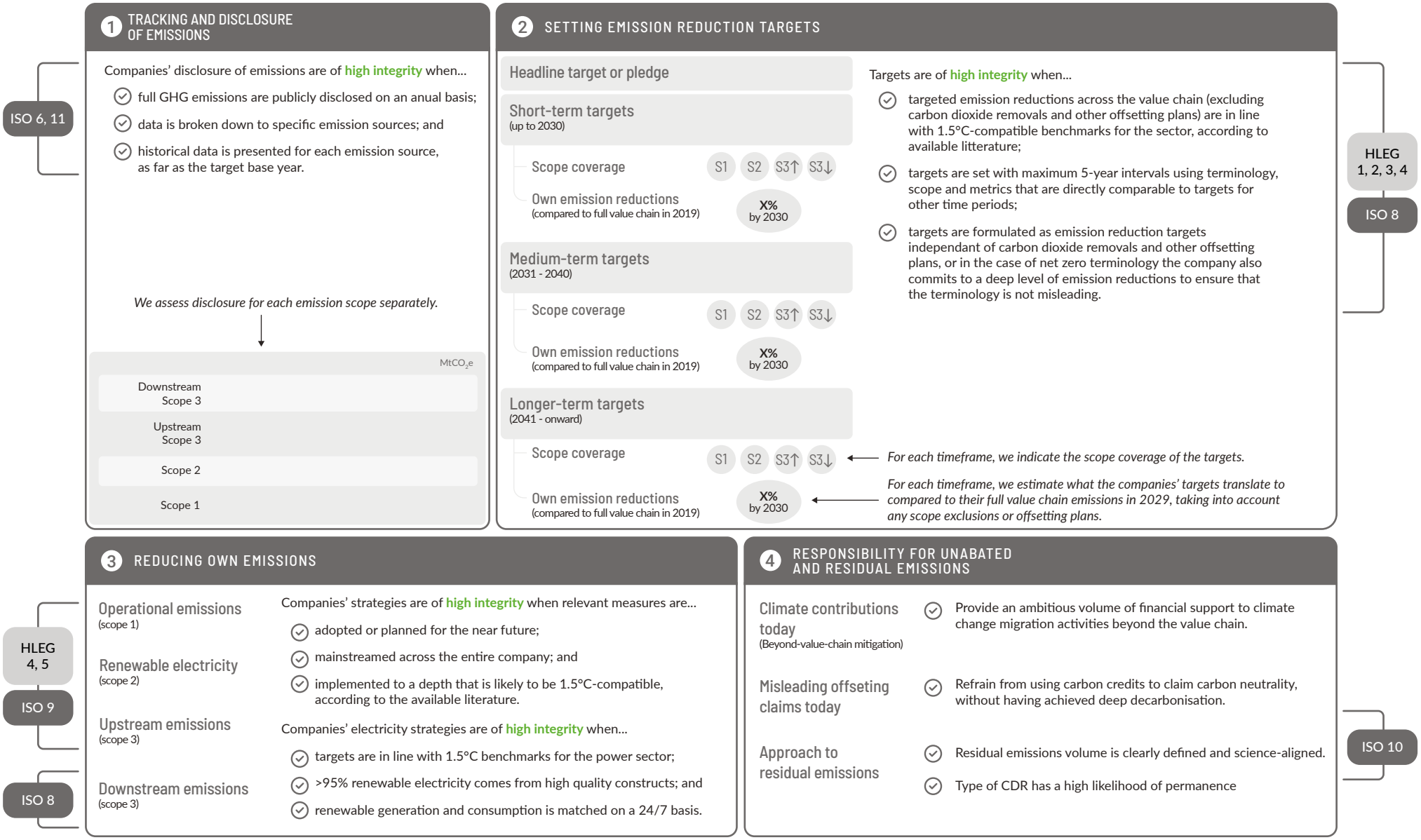


Table 2: Comparison of the Corporate Climate Responsibility Monitor (v4.0) methodology (CCRM, 2024) with four other voluntary standards and guidelines. Adapted from Net Zero Tracker (2023).

	CCRM *(NewClimate Institute, 2024, v4.0)*	How does the CCRM align with other standards?	UN Expert Group *(UN HLEG, 2022)*	ISO Net Zero Guidelines *(ISO, 2022)*	UN Race to Zero *(Race to Zero, 2022, v3.0)*	SBTi Net Zero Standard *(SBTi, 2023d, v1.2)*
CCRM METHODOLOGY COMPONENT 2: SETTING SPECIFIC AND SUBSTANTIATED TARGETS						
Coverage of all emission scopes along the value chain (scopes 1, 2 and 3)	Yes	**Fully aligned with HLEG, ISO & RtZ**	Yes	Yes	Yes	Partially
Net-zero target						
Minimum reduction for 'credible net zero' terminology (compared to 2019)	>90% for all sectors >72% for FLAG sector	**Fully aligned**	Not specified	>90% for all sectors >72% for FLAG sector	Not specified	>90% for all sectors >72% for FLAG sector
Requirement to comply with 1.5°C-aligned decarbonisation milestones	Yes	**Aligned but going beyond**	Not specified	Yes	Not specified	Yes
2030 target(s)						
Five-year intervals for interim targets	Yes	**Fully aligned**	Yes	Yes	Not specified	Partially
Requirement to comply with 1.5°C-aligned decarbonisation milestones	Yes	**Aligned but going beyond**	Not specified	Not specified	Not specified	Yes
Offsetting to achieve interim targets	Not allowed	**Fully aligned**	Not allowed	Not allowed	Not recommended	Not allowed
CCRM METHODOLOGY COMPONENT 3: EMISSION REDUCTION MEASURES						
Specific requirements for transition plans	Yes	**Fully aligned**	Yes	Yes	Not specified	Not specified
Fossil fuel phase-out	Required	**Fully aligned**	Required	Required	Required	Not specified
Additionality & hourly matching for RE	Required	**Aligned with ISO**	Not specified	Recommended	Not specified	Not specified
CCRM METHODOLOGY COMPONENT 4: CLIMATE CONTRIBUTIONS, OFFSETTING CLAIMS AND RESIDUAL EMISSIONS						
Climate contributions	Recommended	**Aligned but going beyond**	Not specified	Not specified	Not specified	Recommended
Carbon neutrality claims today	Not recommended	**Beyond other standards**	Not specified	Not specified	Not specified	Not specified
Approach to residual emissions	Residual emissions definition science aligned; CDR permanence required	**Fully aligned**	CDR permanence required	Residual emissions definition science aligned; CDR permanence required	CDR permanence required	Residual emissions definition science aligned; CDR permanence required

Note: A more detailed version of this comparison table can be found in the accompanying methodological document (NewClimate Institute, 2024)

SECTION A
TRENDS IN CORPORATE CLIMATE RESPONSIBILITY

Section A of this report includes references to different company sample sizes:

- **20 companies:** The 2024 CCRM includes in-depth analyses of 20 companies across four focus sectors: automotive manufacturers, electric utilities, fashion, and food and agriculture (Section B).
- **51 companies:** For our aggregated analysis in Section A, we have also updated our assessments of the 2030 and net-zero targets for all other 31 companies covered in the 2022 and 2023 iterations of the CCRM. The 51 companies reported combined revenues of USD 6.1 trillion in 2022. Their total self-reported GHG emission footprint in 2022, including upstream and downstream emissions (scope 3) that may include a marginal degree of overlap, amounts to approximately 8.8 $GtCO_2e$. This is equivalent to roughly 16% of global GHG emissions in 2022.
- **28 companies:** 28 of the 51 companies analysed in detail by the 2022, 2023 and 2024 iterations of the CCRM belong to the four focus sectors of this report: automotive manufacturers, electric utilities, fashion, and food and agriculture. The 28 companies from these four sectors are sometimes considered in more detail in Section A of this report.

1 Net-zero and 2030 targets: integrity over flexibility in the crucial decade of climate action

1.1 Gradual but insufficient progress in corporate targets for 2030 and beyond

Summary

The 2030 climate pledges of 51 of the largest multinational companies show some gradual improvements over the last two years. We estimate the median 2030 emission reduction commitment of these 51 companies to be 30–33% below 2019 levels. This gradual improvement in 2030 targets coincides with an emerging consensus across recently published voluntary standards on the meaning of credible longer-term corporate net-zero targets. Against this backdrop, an increasing number of companies substantiate their net-zero targets by explicitly committing to deep decarbonisation along their value chains, in line with 1.5°C-compatible emission reduction pathways for their respective sectors.

Despite these gradual improvements, the collective 2030 ambition continues to fall short of the economy-wide emission reductions required to stay below the 1.5°C temperature limit. While some companies set partially 1.5°C-aligned 2030 targets and measures to achieve them, many others either lack credible measures or set inadequate and outdated 2030 targets in the first place. The voluntary nature of existing standards on net-zero targets further allows almost half of the 51 companies to continue remaining vague about what exactly they intend to achieve as part of these pledges.

The world enters the fourth year of the crucial decade for climate action towards 2030 with a rapidly closing window to correct the course on what is required to limit global warming to 1.5°C. To stand a reasonable chance of limiting global warming to 1.5°C, global GHG and CO_2 emissions must decrease by around 43% and 48% respectively between 2019 and 2030, and by 84% and 99% by 2050 (IPCC, 2022).

Against the backdrop of recent scientific findings, the collective ambition of companies' 2030 climate pledges has gradually improved over the last two years. However, most companies continue to fall far short of the economy-wide emission reductions required to stay below the 1.5°C temperature limit until the end of the decade.

The 2030 targets of 51 major companies covered in our CCRM analyses between 2022 to 2024 translate to a median absolute emission reduction commitment of just 30% of the full value chain emissions between 2019 and 2030.[1] This may increase to 33% under the most optimistic scenario that emission intensity targets translate to equivalent absolute emission reductions *(see Figure 2)*. This represents modest progress in companies' mitigation ambition towards 2030, with 19 out of 51 companies having updated their 2030 climate pledges over the last two years to varying degrees.[2]

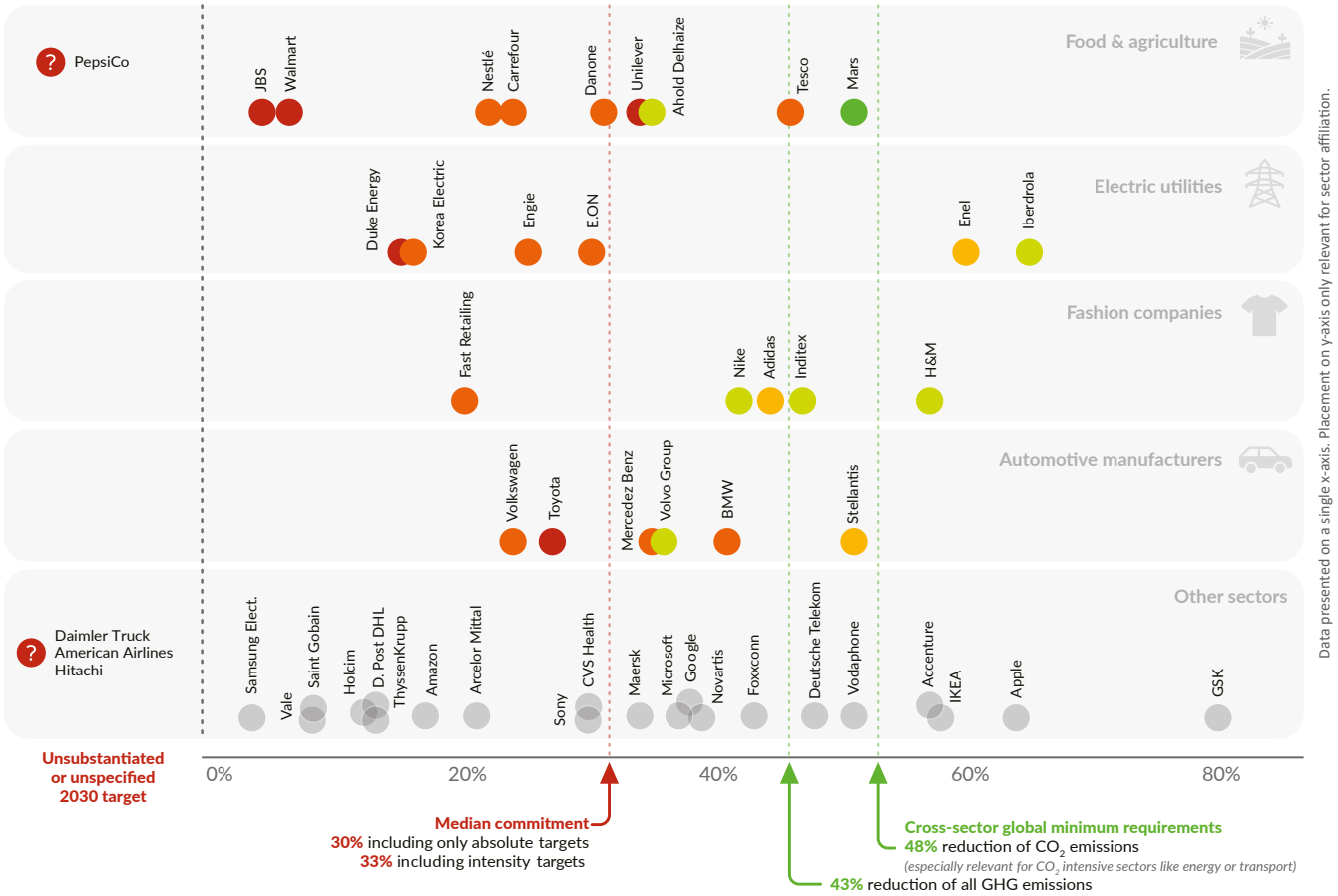
Corporate targets for 2030, however, remain subject to a high level of uncertainty on what they mean in practice. Targets often cannot be taken at face value as companies, among other issues, may omit certain emission sources, use non-harmonised base years, fail to report updated base year emissions, or provide insufficient contextual information to understand what the targets mean in absolute terms.

1 *The CCRM 24 includes in-depth analyses of 20 companies (see Section B). We have updated all 2030 and net-zero targets for all other 31 companies included in the CCRM 22 and 23 as of April 2024 (see Annex I).*

2 *We identify updates 2030 targets for Accenture, BMW, Carrefour, Danone, Enel, ENGIE, Iberdrola, IKEA, Inditex, KEPCO, Maersk, Mars, Mercedes-Benz, Novartis, Tesco, Toyota, Unilever., Vodafone, and Volvo Group as of April 2024 (in alphabetical order).*

Figure 2: The median commitment to emission reductions between 2019 and 2030 is 30-33%

This chart shows the proportion of full value chain GHG emissions that companies commit to reduce between 2019 and 2030.
Data includes 51 companies. 4 companies without clear commitments for 2030 are not included.



Integrity rating: High | Reasonable | Moderate | Poor | Very poor

The colour of the data points represents our assessment of the integrity of company's 2030 targets, based on their sufficiency compared to sector-specific 1.5 °C aligned benchmarks, and the appropriateness of the terminology used in the pledge communication.

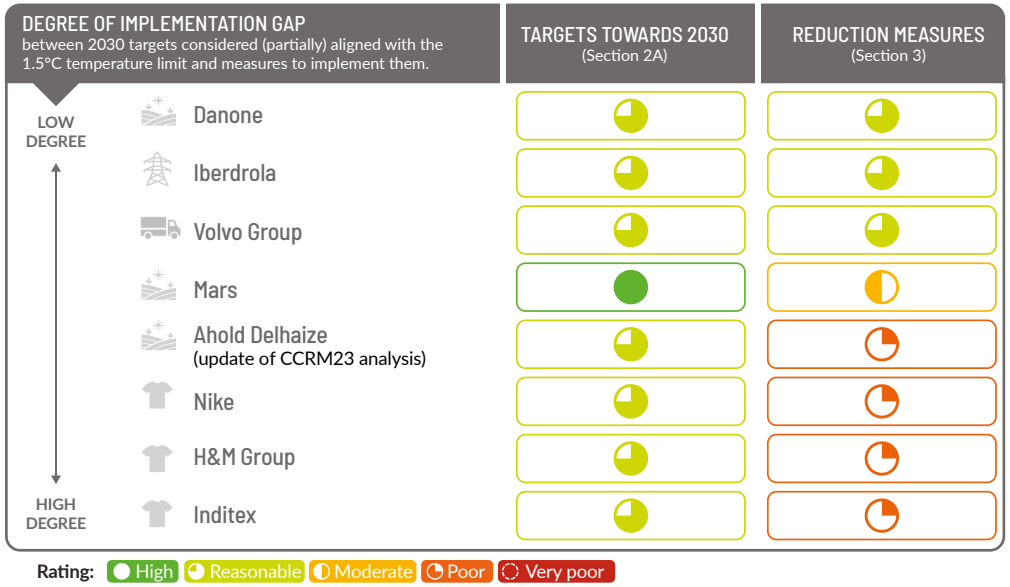
Note: The data in this chart represents the authors' interpretation of companies' emission reduction commitments, based on publicly available information. Targets that are reliant on offsets to an undefined extent are marked as ambiguous. See Section B and Annex III for further details and explanations on individual company cases. The median calculation that includes emission intensity targets represents the most optimistic scenario that emission intensity targets result in equaivalent absolute emission reductions.

Several companies across different economic sectors take a leading role in setting updated and partially science-aligned targets towards 2030. However, companies need to substantiate these targets with transparent and credible plans to achieve them by the end of this decade.

In the four focus sectors of this analysis — fashion, automotive manufacturers, food and agriculture, and electric utilities — eight of the 28 companies assessed have set 2030 targets that we rate as having high or reasonable integrity. These targets at least partially meet 1.5°C-aligned decarbonisation milestones for the major emission sources within specific sectors.

Among these companies, we observe variation in the degree to which companies substantiate these ambitious 2030 targets with relevant emission reduction measures *(see Table 3)*. Only four of the eight companies whose 2030 targets have high or reasonable integrity have emission reduction plans that may support the necessary shift from pledges to actual implementation: **Danone**, **Iberdrola**, **Mars** and **Volvo Group** *(see Section 2.1 for analysis on the mixed progress towards critical sector transitions)*. These companies' targets in combination with their underlying transition plans for 2030 reflect the latest developments in technology, voluntary and regulative frameworks, and scientific findings to stay below the 1.5°C temperature limit. For some other companies, in particular fashion companies like **H&M Group**, **Nike** and **Inditex**, we identify a significant gap between their ambitious targets and the lack of underlying measures to support them.

Table 3: Gap between 2030 targets of 'reasonable' or 'high' integrity and actual emission reduction measures for companies in the fashion, automotive manufacturers, food and agriculture, and electric utilities sectors assessed in the Corporate Climate Responsibility Monitor (CCRM) 2022 to 2024.



Despite some promising developments, many companies' 2030 climate pledges are outdated and remain inadequate. These targets often cover only selected emission scopes and have not been substantially updated for five years or more.

Despite promising developments on updated 2030 targets by leading companies, many other companies' mitigation ambition towards 2030 remains inadequate. Some of these targets were initially set more than five years ago. For example, **Walmart** set its 2030 targets in 2016 and 2017 and has not significantly updated them since. As a result, these targets are outdated and do not reflect latest developments in science, technology, and validation methods.

Against this backdrop, many of these 2030 targets fail to meet key recommendations for 2030 target setting that have been published as voluntary guidance over the last two years. For example, 2030 targets remain predominantly focused on operational scope 1 and 2 emissions, while only inadequately addressing their full up- and downstream scope 3 emissions that are essential to successfully transition their business model *(see Section 1.2 for further analysis on scope 3 targets)*. The UN HLEG recommendations and ISO Net Zero Guidelines both emphasise the need for 2030 targets to cover all emission scopes and address key relevant emission sources along their value chain (ISO, 2022, pp. 19–20; UN , 2022, p. 17).

Some companies even backpedal on their previously announced commitments instead of updating them in line with recent guidance. For example, **Volkswagen** entirely dropped its 2025 target between the reporting periods of 2021 and 2022 without any announced replacement.

The current validation practice of corporate targets by voluntary initiatives allows companies to keep promoting outdated targets. The Science Based Targets initiative (SBTi), as the largest and most influential validator of corporate targets, currently allows validations of 2030 targets to be used indefinitely. From 2025 onwards, companies will "*be required to review, and if necessary revalidate, their targets every five years from the date of the original target approval*" (SBTi, 2024b). However, a five-year review period is arguably too long for a 'science-aligned' target setting process as latest scientific findings on climate action are both fast-developing and indicating an urgent need for re-alignment with those new findings. Our analysis across more than 50 companies suggests that accelerating the revision and validation cycles of corporate climate targets — for example biannually to reflect latest developments — could help to overcome legacy issues that hinder the acceleration of climate action.

An increasing number of companies substantiate their net-zero and carbon neutrality targets in line with recently published voluntary standards and guidance.

More than a year has passed since the release of the recommendations by UN Secretary General's High-Level Expert Group (HLEG), the Net Zero Principles by the International Organization for Standardization, and the second version of the Science Based Targets initiative's Net Zero Standard (ISO, 2022; UN HLEG, 2022; SBTi, 2023d). Recent analysis finds that these voluntary standards, guidance, and assessment frameworks show an emerging consensus on the meaning of credible longer-term corporate net-zero targets and some of the specific criteria to operationalise them *(see Chapter 4 in Net Zero Tracker, 2023)*. The available guidance thus provides companies with specific recommendations on how to pursue longer-term target setting with integrity.

More than half of the major companies we have assessed (29 out of 51) explicitly commit to emission reduction targets alongside their net-zero pledges *(see Figure 3)*. Eighteen companies commit to deep decarbonisation along their value chain by aiming for close to a 90% reduction, partially aligning with 1.5°C-compatible decarbonisation milestones. Some companies have explicitly updated their net-zero pledges over the last two years. For example, **Inditex** clarified that its 2040 net-zero target implies a 90% absolute emission reduction across the entire value chain below 2018 levels, equivalent to 89% below 2019 levels. Similarly, both **Tesco** and **Mars** substantiated their net-zero pledges by committing to emission reduction targets alongside their net-zero pledges in 2023.

Figure 3: 18 of 51 companies commit to deep decarbonisation with their net-zero pledges

This chart shows the proportion of full value chain GHG emissions that companies commit to reduce with their net-zero pledges. Data includes 51 companies. For 18 other companies the meaning of the net-zero target is ambiguous.

Integrity rating: High | Reasonable | Moderate | Poor | Very poor

The colour of the data points represents our assessment of the integrity of company's 2030 targets, based on their sufficiency compared to sector-specific 1.5 °C aligned benchmarks, and the appropriateness of the terminology used in the pledge communication.

Note: The data in this chart represents the authors' interpretation of the authors of companies' emission reduction commitments, based on publicly available information. The chart includes emission reduction commitments under net-zero targets, carbon neutrality pledges and other pledges with equivalent terminology, for the respective target year, which ranges between 2030 and 2050. Targets that are reliant on offsets to an undefined extent are marked as ambiguous. See company case studies in Section B and Annex III for further details on individual company cases.

Despite specific recommendations on how to set credible net-zero targets, almost half of the existing net-zero targets remains of poor or unclear integrity due to the inadequacy or absence of explicit emission reduction commitments, scope exclusions, or ambiguous offsetting and neutralisation strategies.

Twenty-two of the 51 companies continue to remain vague on what exactly they intend to achieve as part of these net-zero pledges. Of these 22 companies, three companies at least commit to measures that implicitly substantiate their pledges by addressing a substantial share of emissions. For example, **Volvo Group** does not set an emission reduction target alongside its 2040 net-zero pledge but does commit to aspirational sales shares of heavy-duty zero-emission vehicles under an illustrative scenario for 1.5°C towards 2040. The other 19 companies neither explicitly specify the extent to which they intend to reduce emissions nor commit to other quantitative decarbonisation milestones that would imply deep emission reductions. The exclusion of relevant emission scopes like for **Walmart**, **Tesco** or **Nestlé** or the ambiguity of the role of emission reductions compared to offsetting and neutralisation strategies like for **Volkswagen** or **Toyota** represent key remaining obstacles for higher ambition across major companies.

The voluntary nature of current standards and guidance continues to leave companies with the flexibility to follow recent recommendations by HELG, ISO, or SBTi or simply continue with vaguely formulated, unsubstantiated, and potentially misleading targets.

1.2 Scope 3 emissions: insufficiency and the risk of backsliding

Summary

The limited depth of emission reduction targets for companies' up- and downstream value chain emissions (scope 3) remain a key limitation for the integrity of most companies' 2030 climate pledges. These emissions are often the most significant and relevant for the sector transformations that would be necessary to align with a 1.5°C pathway. Although we see signs of gradual improvement in addressing value chain emissions by 2030 targets, proposals for introducing flexibility mechanisms in the form of offsetting for scope 3 targets are gaining momentum. This would entail backsliding on already insufficient commitments. The VCMI beta scope 3 flexibility claim could effectively nullify the scope 3 targets of most of the companies we have analysed for the period up to 2030, leaving them accountable only to their scope 1 and 2 emission targets. Any potential link between the VCMI scope 3 flexibility proposal and the SBTi target setting guidance remains unclear. Instead, of addressing the challenges of target implementation through offsetting, the GHG Protocol and SBTi Net Zero Standard revision processes are an opportunity to reconsider the categorisation of value chain emissions to focus on the most critical decarbonisation indicators for each sector which are well within companies' direct control.

A key limitation of many companies' targets for 2030 is the lack of depth in addressing up- and downstream (scope 3) emissions, which account for the majority of their footprint and are often within the direct control of companies.

Up- and downstream (scope 3) emissions account for over 90% of the emission footprints of most of the 51 companies assessed in the CCRM. Companies' 2030 targets – and voluntary initiatives that validate those targets – primarily focus on operational emissions (scope 1 and 2) for the period up to 2030. Addressing up- and downstream scope 3 emissions is essential to successfully transition companies' business models.

In some sectors, scope 3 emissions are the main emission source of relevance regarding the sector transformations that would be necessary to align with a 1.5°C pathway, and these are emissions that are within the direct control of companies because they result directly from business model decisions. Sector transformations often depend on the *type* of product that companies choose to produce, rather than *how* it is produced, as demonstrated in Table 4.

The UN HLEG recommendations and ISO Net Zero Guidelines emphasise the need for 2030 targets to cover all emission scopes (ISO, 2022, pp. 19–20; UN , 2022, p. 17).

Table 4: Relevance of scope 3 emissions for companied covered in the 2024 CCRM

Automotive manufacturers *BMW, Mercedes-Benz, Stellantis, Toyota, Volkswagen Group, Volvo Group. (Daimler Truck does not disclose scope 3 emissions)*	~99% of emissions derive from scope 3 emissions on average, mostly from the use of sold vehicles downstream. The companies' climate footprints are mostly dependent on the extent to which companies continue to produce internal combustion engine vehicles, or transition to manufacturing electric vehicles.	Just ~1% of emissions derive from operations (scope 1 and 2) *to produce* these vehicles. Installing solar panels onto production facilities will not transform the emissions footprint of the businesses.
Food processors and retailers *Ahold Delhaize, Carrefour, Danone, JBS, Mars, Nestlé, PepsiCo, Tesco, Unilever, Walmart*	~95% of emissions derive from scope 3 on average, mostly from activities such as rearing livestock and the use of fertilisers. The companies' climate footprints are mostly dependent on the extent to which companies shift their business models to plant-based products.	Just ~5% of emissions derive from operations (scope 1 and 2) related to operating offices, warehouses and stores. Reducing emissions from operations will not transform the emissions footprint of the businesses.
Fashion producers and retailers *Adidas, Fast Retailing, H&M Group Inditex, Nike*	~95% of emissions derive from scope 3 emissions on average, mostly from the procurement of materials and the use of energy in the supply chain. The companies' climate footprints are mostly dependent on the extent to which companies transition to sustainable materials and renewable energy within the supply chain.	Just ~5% of emissions derive from operations (scope 1 and 2) related to operating offices, warehouses and stores. Reducing emissions from operations will not transform the emissions footprint of the businesses.
Electric utilities *Duke Energy, E.ON, Enel, Engie, Iberdrola, KEPCO*	~63% of emissions derive from scope 3 emissions on average, mostly from the procurement of electricity for retail and the downstream use of sold natural gas. Many major companies transition towards a retail business model, shifting their emissions from scope 1 to scope 3. Their climate footprint is dependent not only on their own generation but also the business model they pursue as a retailer of fossil or renewable energy.	~37% of emissions derive from Scope 1 emissions, mostly from electricity generation. This emission source is highly relevant for many electric utilities, when the business model is focused more on direct generation than retail.

Proposals for introducing flexibility mechanisms for scope 3 targets are gaining momentum, although this would entail backsliding on already insufficient commitments, in many cases nullifying companies' current targets.

There is a clear consensus within the scientific community that companies should not be able to achieve short- and medium-term emission reduction targets through offsetting. This has been a long-standing principle of SBTi since its initiation, and was also one of the key recommendations of the *Integrity Matters* report by the United Nations' High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities (UNFCCC, 2023c).

In contradiction to these recommendations, 2024 sees an active discussion on the potential role of offsetting towards scope 3 targets.

The Voluntary Carbon Markets Integrity initiative (VCMI) *Claims Code of Practice* – launched in November 2023 ahead of COP28 – is intended to be a demand-side rulebook on how companies can make voluntary use of carbon credits as part of credible, science-aligned net-zero decarbonisation pathways (VCMI, 2023a). VCMI's guidelines include a framework for "carbon integrity" claims, which could be understand as a constructive approach to climate change mitigation contributions beyond a company's value chain and targets *(see section 4.1)*, as well as a separate framework referred to as the VCMI beta scope 3 flexibility claim.

VCMI's scope 3 flexibility proposal would allow companies to purchase carbon credits for up to 50% of their annual scope 3 emissions to "bridge the gap" to the scope 3 target trajectory that they are not on track to meet up to 2030 (VCMI, 2023b). Whether this constitutes offsetting depends on one's interpretation of terminology, but it offers companies the possibility to use carbon credits as an alternative, rather than a complement, to cutting their own emissions, during the "critical decade" for action.

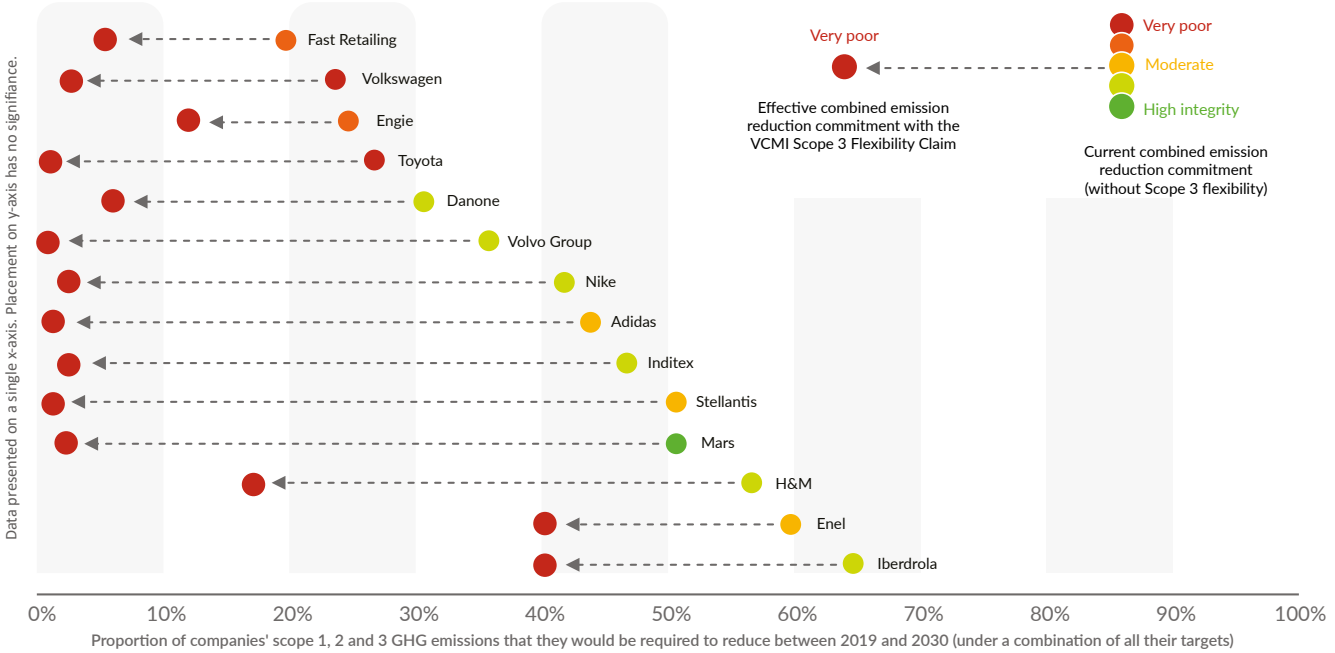
The VCMI's beta claim sets a 50% flexibility threshold compared to a company's actual emissions in any given year, rather than 50% of the emission reductions necessary to achieve the company's target. In other words, companies could still qualify to make some (currently undefined) form of claim regarding their scope 3 targets, even if their emissions are *double* the levels implied by the target trajectory in any given year. In most cases, companies could significantly *increase* their emissions between 2019 and 2030 and still remain eligible for the claim.

To illustrate the implications of the Scope 3 Flexibility Claim, we tested it for the 14 companies covered in this report with SBTi-validated 2030 targets that can be broken down to scope 3 specifically. Of the 14 companies, 11 would be entitled to the flexibility to even *increase* (8) or plateau (3) their scope 3 emissions between 2019 and 2030, rendering these companies' current scope 3 targets effectively meaningless. Figure 4 demonstrates the implications of this for companies' overall commitments to value chain emission reductions between 2019 and 2030 (including a combination of all their targets for scope 1, 2 and 3 emissions), showing that the proposed 50% flexibility mechanism would nullify the scope 3 commitments of most companies and leave them accountable only to their scope 1 and 2 targets.

Under VCMI's beta proposal, the role of carbon credits to "bridge the gap" should phase out by 2035 at the latest. The phase-out by 2035 is identified as a "guardrail" for the Scope 3 Flexibility Claim. However, it is questionable whether the proposed timeline for 2035 can send a meaningful signal to companies, given the high probability of further developments to the rulebooks and recommendations related to corporate accountability and claims over the next decade.

Any potential link between the VCMI scope 3 flexibility proposal and the SBTi target setting guidance remains unclear. In response to pressure from some stakeholders urging SBTi to reverse its long-standing position that companies' short- and medium-term targets should not be met through offsetting, SBTi announced in September 2023 an open call for evidence on the effectiveness of carbon credits and other certificates used for offsetting claims. At COP28 in December 2023, SBTi collaborated with VCMI and other initiatives to announce a "framework for end-to-end integrity" aimed at aligning and complementing their guidance (Manuell, 2023). It remains unclear whether SBTi's position on the use of offsetting towards scope 3 targets could change, and whether the VCMI Scope 3 Flexibility Claim could serve as a basis for any such changes. This would further weaken companies' SBTi scope 3 targets, which in many cases are already critically insufficient to align with 1.5°C pathways *(see section 1.3)*.

Figure 4: The proposed scope 3 flexibility claim would effectively nullify the scope 3 targets of most companies, reducing their 2030 commitments to cover only scope 1 and 2 emissions.



Integrity rating: High | Reasonable | Moderate | Poor | Very poor

The colour of the data points represents our assessment of the integrity of company's 2030 targets, based on their sufficiency compared to sector-specific 1.5 °C aligned benchmarks, and the appropriateness of the terminology used in the pledge communication.

Note: Data includes 14 companies, including all companies from the CCRM 2024 sample with SBTi validations and targets that can be broken down to specific scopes. The 14 companies in this figure are only used as examples; we are not aware and do not intend to imply that these companies have indicated an intention to make use of the Scope 3 Flexibility Claim. The data points in this chart represents the authors' interpretation of companies' emission reduction commitments, based on publicly available information. The data points include the following optimistic assumptions: (1) Emission intensity targets are assumed to result in equivalent absolute emission reductions (2) Although most of the companies would be entitled under the VCMI proposal to increase their emissions, the data points show the scenario under which scope 3 emissions remain constant, rather than assuming that they will indeed increase.

Unnuanced flexibility to offset scope 3 emissions is not the right solution to address the challenges that companies understandably face in implementing targets. Instead, the GHG Protocol and SBTi Net Zero Standard revision processes are an opportunity to reconsider the categorisation of value chain emissions to focus on the most critical decarbonisation indicators for each sector which are well within companies' direct control.

Scope 3 emission reduction targets represent a serious challenge for companies. But it is far too simple to suggest that scope 3 emissions are outside of the direct influence of companies. In particular, the materials that companies choose to procure and the products that their produce are the most relevant business decisions that determine the extent to which companies' transition plans are aligned with the objectives of the Paris Agreement. On these issues, there is no room for flexibility and offsetting is not the right solution. Instead of accounting approaches that lead to ambiguous claims, transparency and constructive dialogue are necessary when companies understandably fall short of the hugely challenging level of necessary ambition.

Instead of addressing the challenge through blanket flexibility across all scope 3 emission categories, the process to revise of the GHG Protocol and SBTi Net Zero Standard throughout 2024 and 2025 offers the opportunity to reconsider the general approach to categorising and accounting for value chain emissions. GHG emission accounting for the value chain could better distinguish between those emission sources within companies' direct influence that are of utmost importance to sector transitions, and other emission sources where companies genuinely have less information and control to lead the transition. Compiling all these emission sources under the extensive umbrella of 'scope 3 emissions' and formulating overarching targets across scope 3 may not afford sufficient focus to the most critical decarbonisation indicators for each sector, and may create non-trivial challenges for companies to account and plan for truly indirect emission sources where they may understandably lack the confidence to set targets without flexibility allowances.

Part of the rationale for scope 3 flexibility proposals is to increase the flow of voluntary climate finance to climate change mitigation projects worldwide through carbon crediting, but climate contributions (also referred to as Beyond Value Chain Mitigation) can also increase the flow of voluntary climate finance *without* compromising transparency and the requirement to decarbonise a company's own emissions *(see contribution claims in section 4.1).*

1.3 Key challenges for improving science-aligned validations of corporate climate targets

Summary

The voluntary Science Based Targets initiative (SBTi), as the largest and most influential validator of corporate climate targets, plays a crucial role in the current accountability system on credible corporate climate action. Our analysis comparing existing SBTi validations for 2030 targets with other analyses by independent assessors points to multiple areas for improvements of its current validation practice. These include a more stringent focus on scope 3 emissions as part of 2030 validations, addressing *legacy* issues stemming from outdated validations and validation methods, and the exclusion of potentially misleading 'insetting' practices.

The SBTi might face multiple challenges to implement such timely improvements. As a voluntary and mostly third-party funded initiative, the SBTi depends on the voluntary participation of companies and needs to accommodate the perspectives of different stakeholders when developing its validation methodologies. These contextual conditions may explain some of the existing flexibility in the system and might present a bottleneck for SBTi to further develop towards fully science-aligned validations that provide the necessary insights for investors, regulators, courts, and other stakeholders on 1.5°C-aligned climate action.

The Science Based Targets initiative (SBTi), as the largest and most influential validator of corporate targets and independent assessments, plays a critical role to validate corporate climate pledges towards 2030. A comparison between the ratings of SBTi and other assessors indicates a significant degree of leniency in current SBTi validation practices and points to multiple areas for improvements.

Founded in 2015, the Science Based Targets initiative (SBTi) has developed into the largest and most influential validator of corporate targets for 2030 and beyond. As of March 2024, the SBTi has validated more than 4,800 companies upon the voluntary request of companies (SBTi, 2024c), establishing itself as the de facto standalone validator of corporate climate targets *(see Section 4.3 for further analysis on the current corporate accountability system)*. Diverse stakeholders including investors, regulators, the judiciary, and civil society use and rely on these validations to tell apart credible climate pledges that are in line with the Paris Agreement objectives, from those that are not.

Out of the 51 companies assessed between 2022 and 2024, 28 are active in the four focus sectors of this analysis: fashion, automotive manufacturers, food and agriculture, and electric utilities. SBTi has validated the 2030 targets of 22 of these 28 companies to be aligned with a pathway to limit global temperature increase to 1.5°C, 'well-below 2°C', or 2°C. Companies generally highlight these validations prominently in their climate-related communications.

The comparison between SBTi's validations of 2030 targets and assessments by the *Corporate Climate Responsibility Monitor* (CCRM), the Transition Pathways Initiative (TPI), the MSCI Net Zero Tracker, and the Planet Tracker identifies five distinct areas for improvements of its current validation practice *(see Table 5 below for detailed overview)*.

✖ **Temperature classifications of target validations for 2030 usually do not apply to large shares of companies' value chains:** Current validations of 2030 targets – phrased as 'target classifications' that provide a temperature alignment – mostly cover operational scope 1 and 2 emissions (SBTi, 2024e). Those temperature classifications do not apply to scope 3 targets in most cases, although companies' scope 3 targets are also listed on SBTi's website. A 1.5°C validation for a given scope 1 and 2 target might in some cases only cover less than 5% of a company's total footprint. SBTi's 'expansive boundary' approach under its SBTi Net Zero Standard only requires companies to cover 67% of all scope 3 emissions for 2030 or 2035 interim targets (SBTi, 2024d, p. 25). In some cases, the expansive boundary may be a reasonable approach to allow companies to focus the most important and accessible emission sources in the short-term. However, the approach can also be used to simply reduce a company's apparent emission reduction ambition across all emission sources. For example, Tesco has SBTi-validated targets for 2032 for its non-FLAG emissions that specifically cover 67% of *each* scope 3 emissions category (except for use of sold products).

✖ **SBTi's validations across companies within respective sectors cover different emission shares along the entire value chain:** Current validations of 2030 targets for different companies within a given sector can cover different emission scopes along companies' value chains.

- **Automotive manufacturers:** The Volvo Group's temperature classification only covers scope 1 and 2, while the temperature classifications of other vehicle manufacturers cover scope 3 use phase emissions for LDVs.
- **Electric utilities:** Enel and Iberdrola's temperature classifications include all scope 3 emission categories while ENGIE's validation covers scope 3 category 1, 2, 3, 11 and 15. E.ON's temperature classification covers no scope 3 emission categories, although scope 3 emissions account for over 90% of the company's GHG emission footprint.
- **Fashion:** Adidas's temperature classification covers all scope 3 emissions while the temperature classifications of other fashion companies cover no scope 3 emission categories.
- **Food and agriculture:** Nestlé and Unilever's temperature classifications includes parts of their scope 3 emissions while the temperature classifications of all other seven food and agriculture companies that we assessed since 2022 do not cover any scope 3 emissions.

We could not identify an explanation of this different coverage within same sectors. These varying scope coverages make it difficult for external audiences to compare companies within any given sector. This is further complicated by the fact that many scope 3 targets listed do not receive a 'target classification' as of April 2024. Other assessors, such as the Transition Pathways Initiative (TPI), use consistent sector-specific methods covering specific emission scopes across all companies in each sector, offering a more uniform basis for comparison.

- ✖ **No disclosure of methods and underlying data used for specific validations:** SBTi neither provides information on validation methods used for specific company validations, nor on underlying data inputs such as base year emissions. On the former, it remains unclear for an external audience whether SBTi uses sector-specific or cross-sectoral methods for specific validations. This reinforces the challenge to understand and compare the validations between companies within a given sector.

- ✖ **Presentation of outdated validations dating back up to seven years and continued use of automotive manufactures validations based on methods discontinued by SBTi ('legacy issues'):** The SBTi continues to list outdated validations on their website, which are subsequently and continuously used by companies in their sustainability reporting. In addition, SBTi list 'well-below 2°C' validations for the scope 3 emissions intensity targets for light duty-vehicles for automobile manufacturers such as **Volkswagen**, **Toyota**, **Mercedes-Benz**, or **BMW** despite indefinitely pausing the methodology's use due to its 1.5°C-incompatibility since March 2022 (SBTi, 2022c). None of these companies have been validated under SBTi's new interim guidance for automobile manufacturers, released in March 2024. This new guidance requires a "phase out of new ICE cars and vans by 2035 in leading markets and by 2040 globally" (SBTi, 2024f, pp. 16–17). Our analysis for Volkswagen and Toyota, for example, shows that neither of the two companies sets ICE phase-out targets in line with these requirements.

- ✖ **Use of carbon dioxide removals *within* the value chain — sometimes referred to as 'insetting' — by companies operating in the forest, land, and agriculture (FLAG) sector:** The SBTi FLAG guidance and the SBTi Net Zero Standard allow companies operating in the FLAG sector to use carbon dioxide removals within the value chain to meet their 2030 and net-zero targets (SBTi, 2023b, pp. 27–28, 2024d, pp. 26–27). This concept — sometimes referred to as 'insetting' — includes approaches under which emissions are offset within the value chain rather than reduced. 'Insetting' through land sequestration carbon dioxide removals is not an equivalent alternative to emission reductions, among other reasons, due to high uncertainties regarding the permanence of outcomes and lack of certification *(see Section 3.4 for detailed analysis)*. **Nestlé** and **PepsiCo** are examples of companies that rely on insetting to achieve 2030 pledges.

Aside from the FLAG sector, the SBTi further allows for emission reduction measures that (partially) occur within a company's scope 3 value chain to count towards target achievement under the term 'insetting' (SBTi, 2023c, pp. 13–14). The SBTi allows this insetting practice on "a case-by-case basis" despite pointing out the lack of standardised definitions and overall uncertainty around this approach (SBTi, 2023c, pp. 13–14).

The SBTi might face multiple challenges to implement these timely improvements on its validation practice for 2030 targets due the voluntary nature of the initiative and the influence of diverse stakeholders.

As a voluntary and mostly third-party funded initiative, the SBTi depends on the voluntary participation of companies and needs to accommodate the perspectives of different stakeholders when developing its validation methodologies. These contextual conditions may explain some of the existing flexibility in the current validation practice and might present a bottleneck for SBTi to further develop towards fully science-aligned validations that are timely and provide the necessary insights for investors, regulators, courts, and other stakeholders on 1.5°C-aligned climate action.

Without the initial improvement listed above, however, existing SBTi validations for 2030 targets continue to lend credibility to some companies whose targets are highly insufficient. This leads to undifferentiated validations of corporate targets, regardless of whether a company has set a 1.5°C-aligned target across the entire value chain or is lagging behind in climate action. As a result, SBTi's 2030 validations currently do not fully provide the timely information to the diverse stakeholders who use and rely on these validations to tell apart companies that embark on the necessary transitions to align their business models with the Paris Agreement objectives, from those that do not.

Table 5: Comparison between 2030 target assessments by (1) the Corporate Climate Responsibility Monitor (CCRM) 2024, (2) the Science Based Targets initiative (SBTi), (3) the Transition Pathway Initiative, (4) the MSCI Net Zero Tracker, and (5) the Planet Tracker; all as of March 2024. Companies listed in alphabetical order for each sector.

COMPANY	CCRM 2024 INTEGRITY ASSESSMENT *(Short-term targets towards 2030)*	SBTi TEMPERATURE RATING *(Near-term targets for specific scopes)*	TPI'S CARBON PERFORMANCE ASSESSMENT *(2030 targets for specific scopes per sector)*	MSCI NET ZERO TRACKER 'TEMPERATURE ALIGNMENT' *(for reduction targets & emissions trajectories)*	PLANET TRACKER 'CLIMATE ALIGNMENT' *(for 2030)*	KEY ISSUES EXPLAINING THE DIFFERENCE BETWEEN SBTi TEMPERATURE RATINGS AND THE CCRM INTEGRITY ASSESSMENTS FOR CORPORATE TARGETS TOWARDS 2030				
						Use of 'insetting'	*Discontinued or legacy validations*	*Exclusion of scope 3 emission share*	*Lack of disclosure on method & underlying data*	*Other reasons*
Automotive manufacturers							⊗	⊗		⊗
BMW	Poor *(CCRM 2022)*	1.5°C & Well-below 2.0°C	2.5°C	1.3°C	n/a					
Daimler Trucks	? Unclear	Not validated	n/a	2.3°C	n/a					
Mercedes-Benz	Poor *(CCRM 2023)*	1.5°C & Well-below 2.0°C	<2.0°C	1.5°C	n/a					
Stellantis	Moderate	Not validated	<2.0°C	1.6°C	n/a					
Toyota	Very poor	1.5°C & Well-below 2.0°C	2.5°C	2.0°C	n/a					
Volkswagen Group	Poor	1.5°C & 2.0°C	>2.5°C	2.3°C	n/a					
Volvo Group	Reasonable	1.5°C	n/a	1.3°C	n/a					
Electric utilities								⊗		⊗
Duke Energy	Very poor	Not validated	>2.5°C	3.3°C	n/a					
Enel	Moderate	1.5°C	<2.0°C	1.3°C	n/a					
Engie	Poor	Well-below 2°C	1.5°C	1.7°C	n/a					
E.ON	Poor *(CCRM 2022)*	1.5°C	1.5°C	1.3°C	n/a					
Iberdrola	Reasonable	1.5°C	1.5°C	1.3°C	n/a					
KEPCO	Poor	Not validated	>2.5°C	2.4°C	n/a					
Fashion								⊗	⊗	⊗
Adidas	Moderate	1.5°C	n/a	1.5°C	n/a					
H&M Group	Reasonable	1.5°C	n/a	1.9°C	n/a					
Inditex	Reasonable	1.5°C	n/a	1.8°C	n/a					
Nike	Reasonable	1.5°C	n/a	1.5°C	n/a					
Fast Retailing	Poor	1.5°C	n/a	3.5°C	n/a					
Food and agriculture						⊗	⊗	⊗	⊗	⊗
Ahold Delhaize	Reasonable *(CCRM 2023)*	1.5°C	n/a	1.6°C	n/a					
Carrefour	Poor*(CCRM 2023)*	Well-below 2°C	n/a	1.3°C	n/a					
Danone	Reasonable	1.5°C	Not assessed due to unsuitable disclosure	2.4°C	>2.0°C					
JBS	Very poor *(CCRM 2023)*	Commitment removed	n/a	3.2°C	n/a					
Mars	High	1.5°C	n/a	n/a	n/a					
Nestlé	Poor	1.5°C	1.5°C	1.9°C	>2.0°C					
PepsiCo	? Unclear *(CCRM 2023)*	1.5°C	n/a	2.0°C	>2.0°C					
Tesco (for 2032)	Poor	1.5°C	n/a	2.4°C	n/a					
Unilever	Poor *(CCRM 2022)*	1.5°C	n/a	1.6°C	>2.0°C					
Walmart	Very poor	1.5°C	n/a	2.2°C	>3.0°C					

⊗ **Legacy:** The SBTi temperature ratings for intensity targets of light-duty vehicles' use-phase emissions use a method permanently paused by the SBTi since March 2022 (BMW, Mercedes-Benz, Toyota, Volkswagen Group).

⊗ **Exclusion:** The SBTi temperature ratings do not cover upstream scope 3 emissions (all), HDV use-phase emissions (Toyota, Volkswagen Group, Volvo Group), and other downstream scope 3 emissions not related to use-phase emissions (all).

⊗ **Other:** CCRM assessments considers a range of 1.5°C-specific decarbonisation milestones for specific geographies like the EU or US identified in the literature

⊗ **Exclusion:** The SBTi temperature ratings cover different emission scopes ranging from the coverage of all emission scopes (Enel, Iberdrola), partial coverage of scope 3 emissions (Engie) to operational emissions only (E.ON).

⊗ **Other:** CCRM assessments considers a range of 1.5°C-specific decarbonisation milestones for specific geographies like the EU or US identified in the literature.

⊗ **Exclusion:** The SBTi temperature ratings for all companies except Adidas only cover operational emissions, excluding all scope 3 emissions (~95% of total emissions).

⊗ **Disclosure:** We cannot identify the SBTi method used for Adidas' validation covering scope 3 emissions (e.g., cross-sectoral and/or sector-specific methods).

⊗ **Other:** CCRM assessments considers that no targets set within five-year intervals towards 2030 (H&M Group, Inditex, Nike).

⊗ **'Insetting':** Several SBTi temperature ratings in the FLAG sector allow for the use of 'insetting' within the value chain (Nestlé, PepsiCo, Unilever).

⊗ **Outdatedness:** The SBTi displays outdated temperature classifications on its webpage for targets dating back more than five years ago (Walmart).

⊗ **Exclusion:** The majority of SBTi temperature ratings do not cover any upstream scope 3 emissions (Ahold Delhaize, Carrefour, Danone, Mars, PepsiCo, Tesco, Walmart).

⊗ **Disclosure:** We cannot identify the SBTi method used for validations (Ahold Delhaize, PepsiCo) and/or the underlying data relevant for the validation (Carrefour).

⊗ **Other:** CCRM assessments considers that no targets set within five-year intervals towards 2030 (Ahold Delhaize, Danone).

Our analysis indicates that the SBTi's Net Zero Standard may provide a credible framework for net-zero targets that are substantiated by emission reduction commitments. However, the lack of clarity on the treatment of carbon dioxide removals *within* the value chain raises questions over validations in the forest, land, and agriculture (FLAG) sector, and compliance across sectors must be thoroughly and continuously monitored in the future.

Alongside validations for 2030 targets, SBTi has validated more than 730 companies' net-zero targets as 1.5°C-aligned as of March 2024 (SBTi, 2024c). More than 1,900 companies have officially committed to setting net-zero targets in line with the SBTi Net Zero Standard, although SBTi has not yet validated their targets.

Among the 28 companies in the four focus sectors we assessed, six have had their net-zero pledges certified by SBTi under its Net Zero Standard. We find the net-zero pledges of **Enel**, **Iberdrola**, **H&M Group**, and **Mars** to be of reasonable integrity. SBTi's Net Zero Standard mandates that net-zero pledges should equate to at least 90% emission reductions across the full value chain. This requirement directly addresses the key issues that undermine many other companies' net-zero pledges, which either lack clarity or fail to commit to deep decarbonisation. The validated 2050 net-zero targets by **Nestlé** and **Tesco** under the FLAG sector, however, are prone to the same issues concerning the use of carbon dioxide removals *within* the value chain as those observed in 2030 target validations.

Another four of the 28 companies from the focus sectors assessed in this report have officially committed to the Net Zero Standard through SBTi's webpage, but SBTi has not yet validated their targets. We evaluate the net-zero targets of two of those four companies to have very poor integrity (**BMW**, **PepsiCo**) and two others as reasonable (**Ahold Delhaize**, **Inditex**). In March 2024, SBTi removed previously made commitments by more than 200 companies from its target dashboard as these companies did not substantiate their net zero commitments with specific targets within the required time period (Robinson-Tillett, 2024; SBTi, 2024a). This affected five companies of the 28 companies assessed in this report (**ENGIE**, **Carrefour**, **JBS**, **Unilever**, **Walmart**), all of which we evaluated as of poor or very poor integrity.

Table 6: Comparison between integrity assessment of net-zero targets as part of the Corporate Climate Responsibility Monitor (CCRM) 2024 and validations of net-zero targets by the Science Based Targets initiative (SBTi) as of March 2024. Companies listed in alphabetical order.

COMPANY	CCRM 2024 INTEGRITY ASSESSMENT *(for net-zero targets in the medium- or longer-term)*	SBTI VALIDATIONS *(for net-zero targets)*
Ahold Delhaize	**for longer-term beyond 2041;** *CCRM 2023 update*	**Officially committed** since 2021, no validation
BMW	**for longer-term beyond 2041;** *CCRM 2022 update*	**Officially committed** since 2021, no validation
Carrefour	**for medium-term between 2031–2040;** *CCRM 2023 update*	**Commitment removed** since 2024
Enel	**for medium-term between 2031–2040**	**1.5°C** validated in 2023
Engie	**for longer-term beyond 2041**	**Commitment removed** since 2024
H&M	**for medium-term between 2031–2040**	**1.5°C** validated in 2022
Iberdrola	**for medium-term between 2031–2040**	**1.5°C** validated in 2022
Inditex	**for medium-term between 2031–2040**	**Officially committed** since 2021, no validation
JBS	**for longer-term beyond 2041;** *CCRM 2022 update*	**Commitment removed** since 2024
Mars	**for longer-term beyond 2041**	**1.5°C** validated in 2022
Nestlé	**for longer-term beyond 2041**	**1.5°C** alidated in 2022
PepsiCo	**for longer-term beyond 2041**	**Commitment removed** since 2021, no validation
Tesco	**for longer-term beyond 2041**	**1.5°C** validated in 2022
Unilever	**for medium-term between 2031–2040;** *CCRM 2022 update*	**Commitment removed** since 2024
Walmart	**for longer-term beyond 2041**	**Commitment removed** since 2024

Integrity rating: High | Reasonable | Moderate | Poor | Very poor

1.4 Summary of recommendations for improving the integrity of corporate climate target setting

Recommendations for improving integrity of corporate climate target setting

- **Companies:** Companies should follow an **accelerated revision cycle for corporate climate targets** towards 2030 to align their targets with the latest developments in science, technology, and validation methods. This revision process should incorporate the latest recommendations on corporate target setting, such as those from the UN High-Level Expert Group (UN HLEG) or the ISO Net Zero Principles. Short-, medium- and long-term targets should, among others, cover *all* emission scopes along the value chain including scope 3 value chain emissions, be set at least within five-year intervals, and be aligned with 1.5°C-compatible sector-specific pathways with no or limited overshoot.

- **Regulators:** Regulators should enact **mandatory regulations** to mandate companies to set legally binding targets and transition plans aligned with the 1.5°C trajectory. Such mandatory regulations — even if they encounter challenges like political lobbying themselves — could effectively address some of the existing shortcomings of a predominantly voluntary system that provides companies full flexibility on whether to follow existing voluntary guidance or not.

- **Science Based Targets initiative (SBTi):** The SBTi, as the largest and most influential validator of corporate climate targets, could implement improvements to ensure the high integrity of their 'target classifications' going forward.

  - **Increase the frequency of the validation cycle for 2030 corporate climate targets** to align validations with the latest developments in validation methods and latest scientific findings.

  - **Revise approach and develop methodologies to cover scope 3 emissions** related to key relevant emission sources along the value chain in SBTi's target classifications.

  - **Remove outdated and 'legacy' validations** issued several years ago or based on methodologies that have been paused indefinitely, such as intensity targets for light-duty vehicles in the automotive sector.

  - **Revise the SBTi's FLAG guidance** to specify minimum requirements for the reduction of agricultural emissions, alongside carbon dioxide removals.

  - **Transparently disclose underlying data and methods for each validation and communicate existing limitations affecting current validations.**

- **SBTi, GHG Protocol and Voluntary Carbon Markets Integrity (VCMI) initiative:** The consultations by SBTi on the effectiveness of environmental attribute certificates in climate targets, the revision process of the GHG Protocol, and the finalisation of VCMI claims will take place throughout 2024 and 2025.

  - These processes should reaffirm that offsetting cannot play a role towards company's inventories and the achievement of companies' emission reductions targets. This position aligns with the recommendations of the UN HLEG, ISO Net Zero Principles, and the original SBTi principles. The challenge of meeting the necessary ambition poses understandable difficulties for companies. Resolving this issue necessitates open dialogue and collaborative solutions, rather than resorting to more ambiguous accounting approaches that obscure genuine progress. The VCMI carbon integrity claims and the SBTi beyond value chain mitigation recommendations offer a more transparent and constructive approach to scaling up voluntary climate finance, compared to scope 3 'flexibility' claims.

  - Instead of addressing the challenges by allowing unnuanced flexibility in the form of offsetting across all scope 3 emission categories, the GHG Protocol and SBTi Net Zero Standard revision processes create an opportunity to reconsider the categorisation of value chain emissions to focus on the most critical decarbonisation indicators for each sector, which are well within companies' direct control.

2 Mixed progress towards critical sector transitions

2.1 Some sectors on the right track but accelerated efforts required

Summary

Only four of the 20 companies assessed present emission reduction measures that have *reasonable* integrity. These are Enel, Danone, Iberdrola and Volvo Group. We evaluated the measures of another four companies to have *moderate* integrity, while over half of the companies receive a *poor* or *very poor* integrity rating for their emission reduction plans. For some companies, we identify a strong gap between ambitious targets and the absence of underlying measures *(see section 1.1)*.

Overall, we find that the European electric utilities are on the right track when it comes to ramping up renewable energy generation, although increased deployment is necessary to meet regional 1.5°C-aligned benchmarks for electricity generation. Enel is the only one of the electric utilities present a comprehensive plan to phase out *all* fossil fuels *(see Section 3.1)*. Automotive manufacturers are also moving in the right direction – albeit at a slow pace. All automotive manufacturers we assessed in our report present plans for phasing in electric vehicles, which is critical to eliminate use-phase emissions. In the food and agriculture sector, most companies are reluctant to implement deep and comprehensive emission reduction measures, although we identified some promising exceptions. Four of the five fashion companies assessed set ambitious 2030 targets, but none present convincing plans on how to reduce emissions.

Most companies assessed in this report do not take the necessary measures to significantly reduce their GHG emissions. The *sectoral transition frameworks* in section B describe what measures companies active in the four focus sectors of this report should take to place themselves on a 1.5°C-aligned trajectory. Only four of the 20 companies assessed in this report present measures that have reasonable integrity *(see Table 7)*. These are Enel, Danone, Iberdrola and Volvo Group. We evaluated the emission reduction measures of another four companies – Mars, Stellantis, Volkswagen Group, and Walmart – to have moderate integrity. The other 12 companies do not implement the measures that would be necessary for sectoral transitions.

Table 7: Overview of key emission reduction measures implemented by the 20 companies assessed in the CCRM 2024.

	EVALUATION OF EMISSION REDUCTION MEASURES
Automotive manufacturers	**Volvo Group** (HDV) The company present targets for procurement of low-carbon steel and aluminium (upstream scope 3, 4% of 2022 emissions). Relevant measures for use-phase emissions presented, including zero-emission vehicle technologies and charging infrastructure. Plans to sell ICEs using biofuels and e-fuels in 2040, even though battery electric vehicles are technologically possible.
	Stellantis (LDV) Plans to address upstream scope 3 emissions (about 10% of 2022 emissions) lack detail. The company presents relevant measures to reduce downstream scope 3 emissions (90% of 2022 emissions), including phasing in electric vehicles. Targets for EV phase-in not aligned with sectoral benchmarks for all markets.
	Volkswagen Group (LDV and HDV) Several measures to reduce upstream scope 3 emissions (about 15% of 2022 emissions) presented, but limited details on timeline, milestones, and expected impact. The company present plans to address downstream scope 3 emissions (about 85% of 2022 emissions), but limited details on the timeline and expected impact. While the company's phase in targets for electric LDVs fall short of sectoral benchmarks, its targets for HDVs are aligned with Paris-compatible sectoral benchmarks.
	Daimler Truck (HDV) No measures to reduce key upstream scope 3 emission sources. Relevant measures for use phase emissions, including zero emission vehicle technologies and charging infrastructure. Limited details on the timeline and impact up to 2030.
	Toyota (LDV and HDV) No measures to reduce upstream scope 3 emissions (20% of 2022 emissions) identified. The company present some plans to address downstream scope 3 emissions (about 80% of 2022 emissions), but with limited details on scope and timeline. Its target for phasing in EVs in the EU and UK falls short of regional benchmarks.
Electric utilities	**Enel** Commitment to phase out coal by 2027 and gas by 2040; and to rapidly increase the share of renewables in electricity generation. Pace is not quite sufficient to fully align with EU benchmarks.
	Iberdrola Coal power plants phased out in 2020, but no comprehensive strategy to end fossil gas sales. Ambitious renewable deployment plan for 2030.
	Engie Plans to phase out coal, but not gas power plants; the company invests in CCUS development to continue using fossil gas. No clear support for large-scale electrification of end consumers. Renewable ramp up is insufficient.
	Duke Energy Commitment to phase out coal by 2035 and gas by 2050, falling short of US benchmarks. Limited investments in renewables and targets for renewable energy generation fall short of global benchmarks.
	KEPCO Inadequate targets for renewable electricity generation; the company plans for a delayed coal phase out and plans for CCUS and co-firing with hydrogen risk a lock in of fossil gas.
Fashion	**Adidas** Measures to phase out coal and increase renewable energy use in the supply chain (95% of 2022 emissions) but scale of implementation unclear. No commitment to stop overproduction.
	H&M Group Measures for upstream scope 3 (about 90% of 2022 emissions) cover all key areas but lack sufficient information to estimate impact. H&M Group is investing in renewable electricity for suppliers, but the scale of implementation is unclear. Signals that the company relies on bioenergy to decarbonise the supply chain. No commitment to reduce overproduction. Encourages suppliers to switch to bioenergy and natural gas.
	Inditex Measures for upstream scope 3 (about 95% of 2022 emissions) cover all key areas but lack sufficient information to estimate impact. Signals that Inditex may rely on bioenergy. No commitment to reduce overproduction.
	Nike Measures for upstream scope 3 (about 90% of 2022 emissions) cover all key areas but lack sufficient information to estimate impact. No commitment to reduce overproduction.
	Fast Retailing Presented measures lack sufficient information to estimate impact. No commitment to reduce overproduction.
Food and agriculture	**Danone** Several measures to reduce upstream scope 3 emissions identified (about 80% of 2022 emissions), including a plan to increase the share of plant-based protein.
	Mars The company commits to relevant measures to reduce its emission sources in the upstream value chain (around 80% of 2022 emissions) to meet its 2030 target. However, the company neither considers measures for upstream emissions post-2030 nor introduces measures of its downstream value chain (responsible for 16% of 2022 emissions).
	Walmart Supplier engagement programme presented for significant upstream scope 3 emission sources (over 90% of 2022 emissions), but information lacks detail.
	Nestlé Some measures to reduce upstream scope 3 emissions identified (about 80% of 2022 emissions), but these include uncertain measures such as regeneration. Little measures that will lead to deep decarbonisation presented.
	Tesco No measures identified that meaningfully reduce either upstream or downstream scope 3 emissions (respectively 55% and 43% of 2022 emissions).

Rating: High | Reasonable | Moderate | Poor | Very poor

Electric utilities are moving in the right direction, but increased efforts to generate renewable electricity are necessary.

Decarbonising the power system requires both a significant ramp up of renewable electricity generation and a rapid phase out of fossil fuels. Increasing renewable capacity, especially from wind and solar, is key to decarbonise the power system (CAT, 2023b, p. 16). Globally, 59-89% of electricity should be from renewables by 2030, growing to 85-99% by 2040 and 89-100% by 2050 (IEA, 2022b, p. 197, 2023c, p. 197; Teske, 2022, p. 296; Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 16; IRENA, 2023c, pp. 22, 75). In advanced economies, however, the transition to renewable electricity generation should go at a faster pace. In the EU, renewables should account for close to 90% of electricity generation in 2030 and close to 100% by 2040 (CAT, 2023b, p. 16). While phasing in renewable capacity, electric utilities should phase out fossil fuels to avoid stranded assets and locked-in emissions that will derail us from staying in a 1.5°C trajectory (IEA, 2023c).

In the electric utilities sector, commitments to phasing out coal for own generation are in place, but we need clearer plans for phasing out fossil gas — both in electricity generation and sales — and for the electricity purchased for resale. All five electric utilities present plans for phasing out coal, but with strong differences on the timeline: whereas Iberdrola phased out coal in 2020, KEPCO plans to do so only in 2050 *(see Table 11 in Section 3.1)*. A 1.5°C-aligned plan to phase out fossil gas is still missing for four out of five companies: Enel is the only one to commit to phasing out gas across its value chain. Section 3.1 discussed the electric utilities' fossil fuel phase-out plans in more detail.

All electric utilities assessed plan to ramp up renewable electricity generation, but just two of the five set renewable targets that put them on a Paris-aligned trajectory. Iberdrola, Enel and – to a lesser extent – ENGIE have scaled up their renewable generation capacity in recent years *(see Table 8 and Table 9)*. Iberdrola's and Enel's 2030 targets meet the global benchmark of 59–89% of *electricity generation* and 68–77% of total *installed capacity* by 2030 (IEA, 2022b, p. 197, 2023c, p. 197; Teske, 2022, p. 296; Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 16; IRENA, 2023c, pp. 22, 75). However, both companies may need to increase their efforts to meet European benchmarks, which show that renewables should generate close to 90% of electricity generation by the end of this decade (CAT, 2023b, p. 16). Although ENGIE is also ramping up its renewable capacity, the company's target of 58% installed capacity by 2030 falls short of global and European benchmarks.

Renewables account for a minor share of Duke Energy's and KEPCO's portfolios today *(see Table 8 and Table 9)*. Although both companies aim to significantly ramp up their renewable electricity generation until 2030, their efforts are insufficient to put them on a Paris-aligned trajectory. Both companies commit to a share of about 20% renewable electricity generation by 2030, which means a doubling of Duke Energy's current renewable electricity generation and a seven-fold increase of KEPCO's. However, global benchmarks require that renewables account for at least 59% of electricity generation by 2030. In the US, where Duke Energy operates, this should be at least 68% (CAT, 2023b, p. 16).

Table 8: Electric utilities' 2030 renewable installed capacity portfolios and targets.

COMPANY	RENEWABLE INSTALLED CAPACITY PORTFOLIO				RENEWABLE INSTALLED CAPACITY TARGET
	2019	*2021*	*2022*	*2023*	*2030*
1.5-compatible global benchmarks					68-77%
Iberdrola	62%	65%	66%	67%	93%
Enel	50%	58%	63%	*Data not available yet*	85%
ENGIE	28%	34%	38%	41%	58%
KEPCO	*No data*	9%	9%	*Data not available yet*	No data
Duke Energy	7%	8%	13%	*Data not available yet*	No data

Sources: ENGIE (2020, p. 66, 2024, p. 65), Duke Energy (2019, p. 16, 2021, p. 14, 2022, p. 37), KEPCO (2022, p. 11, 2023, p. 11), Iberdrola (2021, p. 22, 2023d, p. 19, 2024, p. 19), Enel (2020, p. 38, 2021, p. 153)

Table 9: Electric utilities' renewable generation portfolios and targets

COMPANY	RENEWABLE GENERATION PORTFOLIO				RENEWABLE GENERATION TARGET
	2019	*2021*	*2022*	*2023*	*2030*
1.5-compatible global benchmarks					59-89%
Iberdrola	39%	45%	46%	47%	*No data*
Enel	34%	49%	49%	*Data not available yet*	*No data*
ENGIE	*No data*	*No data*	*No data*	35%	*No data*
KEPCO	*No data*	3%	3%	*Data not available yet*	22%
Duke Energy	2%	2%	8%	*Data not available yet*	18%

Sources: ENGIE (2024, p. 92), Duke Energy (2019, p. 16, 2021, p. 14, 2022, p. 22), KEPCO (2022, p. 11, 2023, p. 11), Iberdrola (2021, p. 23, 2023d, p. 1, 2024, p. 19), Enel (2020, pp. 276–277, 2023a, p. 458)

Automotive manufacturers are phasing in electric vehicles, but not yet at the pace needed to place the sector on a 1.5ºC-aligned trajectory.

Phasing out internal combustion engines and replacing them with electric vehicles is crucial to transform the automotive sector. By far the largest source of automotive manufacturers' GHG footprint is the combustion of fossil fuels when their cars, trucks or buses are used. For the companies assessed in this report, use phase emissions (scope 3, category 11) account for over 80% of all reported emissions. Electric vehicles powered by decarbonised electricity have a large potential to reduce the GHG emissions of light-duty and heavy-duty vehicles (IPCC, 2022; Jaramillo *et al.*, 2022). Phasing out vehicles with an internal combustion engine (ICE) is the most important measure that automotive manufacturers should take to align their business with a 1.5°-compatible trajectory. Enabling measures to support the roll-out of vehicle charging infrastructure and to support demand management solutions can complement automotive manufacturers' climate strategies (Pathak *et al.*, 2022; Boehm *et al.*, 2023; IEA, 2023b).

Although automotive manufacturers acknowledge the need to phase in electric light-duty vehicles (LDVs), the transition is not going fast enough. The share of LDV sales in 2022 for Stellantis, Toyota and Volkswagen Group were 5%, 0.2%, and 7% respectively. All three companies plan to rapidly increase these shares until 2030, but the transition to EVs needs to go much faster than the pace anticipated by Stellantis, Toyota, and Volkswagen *(see Table 8)*. Only Stellantis' target for Europe meets 1.5°C-aligned milestones, which show that by 2030, sales of electric light-duty vehicles should reach 67%–95% globally and 95–100% in the EU and US (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). The LDV manufacturers' targets for the European market are more ambitious than their targets for other regions. We expect this is the result of the EU and individual member states setting tentative phase-out dates for ICEs earlier than the Chinese and US governments *(see section 2.2 and IEA (2023b, p. 89))*.

Two of the three heavy-duty vehicle (HDV) manufacturers assessed set Paris-aligned zero-emission vehicles sales targets for most of their brands *(see Table 10)*. In 2022, 4.5% of global bus sales and 1.2% of global truck sales were EVs (IEA, 2023b, p. 32). These shares need to increase by over 2,000% until the ends of this decade: by 2030, 56-60% of global bus sales and 30-37% of global truck sales need to be battery electric vehicles (BEVs) and fuel cell electric vehicles (FECVs) (UNFCCC, 2021; Boehm *et al.*, 2023; IEA, 2023c). Volvo Group and Volkswagen Group's subsidiaries MAN, Navistar, Scania, and Volkswagen Truck & Bus committed to EV phase-in targets for 2030 that could be aligned with Paris-compatible benchmarks: aiming for at least 35% and 40%, respectively. In contrast, Daimler Truck frames its target to sell "up to 60%" of zero-emission vehicles by 2030 as an aspirational goal with no minimum bound. Depending on the sales share that Daimler Truck will achieve by the end of this decade, the company could meet or massively fall short of sectoral benchmarks.

Charging infrastructure for HDVs is less developed than for LDVs. To address this issue, the three HDV manufacturers formed a joint venture to invest EUR 0.5 billion to roll out a high-performance public charging network for battery electric trucks and coaches (Volvo Group, 2023a, p. 35).

Table 10: Light-duty vehicle and heavy-duty vehicle manufacturers' 2030 targets for the phase-in of battery electric vehicles

	COMPANY	2030 TARGETS
TARGETS FOR ELECTRIC HEAVY-DUTY VEHICLES	Stellantis	• 100% sales share of battery electric passenger cars in the EU by 2030 • 50% sales share of battery electric passenger cars and light-duty vehicles in the USA by 2030
	Toyota	• 50% sales share of battery electric vehicles in EU and the UK by 2030
	Volkswagen Group	• At least 70% sales share of electric LDVs in Europe • At least 50% sales share of electric LDVs in the US and China
	BMW *(update of CCRM22 analysis)*	• No targets for phasing in EVs identified
	Mercedes-Benz *(update of CCRM23 analysis)*	• 50% share of plug-in hybrid and all-electric vehicles around 2025, when market conditions allow • Mercedes-Benz is "all electric" by 2030, wherever market conditions allow
TARGETS FOR ELECTRIC HEAVY-DUTY VEHICLES	Daimler Trucks	• Aspirational goal of "up to 60%" sales share of zero-emission vehicles in Europe Japan, and the US by 2030
	Volkswagen Group's subsidiaries MAN, Navistar, Scania and Volkswagen Truck & Bus.	• MAN, Navistar, and Scania each make subsidiary-specific pledges of a minimum 40% sales share for zero-emission vehicles by 2030
	Volvo Group	• At least 35% sales share of electric vehicles by 2030
	Toyota's subsidiary Hino	• No phase-in target identified

Large fashion brands are implementing some measures to electrify manufacturing processes and switch to renewables but not yet at the scale needed. Measures to reduce emissions from material production are questionable and may distract from real solutions.

Fashion companies need to implement a set of measures to decarbonise their business, including electrification and switching to renewables in the supply chain, investing in innovative low-carbon materials, and stopping overproduction. Over 95% of fashion brands' emissions occur in the supply chain, with about 75% attributable to energy-intensive manufacturing processes (Sadowski *et al.*, 2021; Sadowski, 2023). Thermal energy to produce steam and hot water accounts for a substantial share of the total energy demand in the sector. For instance, in China, Japan, and Taiwan, thermal energy represents over half of the total energy demand in the textile industry (Hasanbeigi and Zuberi, 2022). Often, manufacturers of fabrics and other materials (tier 2) and suppliers assembling the final products (tier 1) use on-site coal-fired boilers. Electrifying heat and steam processes can substantially reduce the fashion sector's energy demand and GHG emissions, for instance, through industrial heat pumps, electric steam boilers, and electric processing equipment (Hasanbeigi and Zuberi, 2022). Raw materials production accounts for about a quarter of fashion companies' total GHG footprint (Sadowski *et al.*, 2021; Sadowski, 2023). These emissions can be reduced by investing in the development of innovative materials, including biosynthetic fibres and hemp, which have a lower carbon footprint than fabrics commonly used in the fashion sector (Ley *et al.*, 2021; Sadowski *et al.*, 2021; Sadowski, 2023). In addition, stopping overproduction and moving away from the fast fashion business model are crucial to place the fashion industry on a 1.5°C-aligned trajectory.

While all five fashion companies assessed work to increase renewable electricity in the supply chain, clear targets and a comprehensive package of measures are missing. H&M Group is the only fashion company assessed to commit to 100% renewable electricity in the supply chain by 2030 (H&M Group, 2023d, p. 26). Inditex commits to 50% renewable electricity in manufacturing processes by 2030 (Inditex, 2024b, p. 10). However, there are caveats to these pledges, including potential reliance on renewable electricity certificates (RECs), the lack of a commitment to electrify manufacturing processes, and a switch to biomass to replace coal in the supply chain (*see section 3.2 for a discussion on the limitations of RECs and section 3.3 for more details on the issues with bioenergy).* Four of the five companies report measures to support suppliers with the procurement of renewable electricity. Adidas, H&M Group, Nike, and Inditex all report capacity building measures, incentive instruments and/or financial support. For instance, Nike offers suppliers in China, Vietnam, and Indonesia technical advice and assistance for on-site solar PV (Nike, 2023, p. 98); Inditex developed an online knowledge platform (Inditex, 2023a, p. 205); and Adidas incorporated renewable energy and decarbonisation performance in its supplier assessment process (Adidas, 2023b, p. 84). Despite these encouraging signals, none of the companies assessed present a comprehensive package of measures to electrify their supply chains, raising concerns about the feasibility of the companies' ambitious 2030 targets. In addition, all five fashion companies use biomass in the supply chain and some explicitly consider this as a measure to reduce coal reliance and GHG emissions. Strong reliance on biomass could undermine companies' decarbonisation efforts, as biomass is not an emissions-free energy source and has several other negative sustainability implications, including biodiversity loss *(see section 3.3)*.

None of the five fashion companies present concrete plants to scale up the use of innovative low-carbon materials. Adidas, Fast Retailing, H&M Group, Inditex, and Nike all claim to use recycled materials, most notably cotton and polyester (Adidas, 2023b, p. 88; Fast Retailing, 2023b, p. 17; H&M Group, 2023d, p. 45; Inditex, 2023a, p. 189; Nike, 2023, pp. 103–104). While the term "recycled materials" has a positive connotation, it does not significantly lower GHG emissions and may distract companies from the need to search for real solutions. Less than 1% of materials used to produce clothing is recycled and used for new clothing (Morlet *et al.*, 2017). Recycled polyester in the fast sector generally comes from PET bottles from the beverage industry (Cobbing and Vicaire, 2017; Majumdar *et al.*, 2020). By buying large amounts of PET bottles, fashion companies drive the need for virgin plastics – made with crude oil – in other sectors. Similarly, for "recycled cotton," it is unclear whether companies recycle used and discarded clothing, or rather unsold clothes, in which case "recycling" distracts from the need to reduce overproduction. Some of the companies are investing in the development of innovative materials (e.g., H&M Group, 2023d, p. 47; Inditex, 2023b, p. 10), but these efforts need to be massively scaled up to reduce the fashion sector's climate and other sustainability impacts *(see section 7.2)*.

None of the five fashion companies present concrete measures to reduce overproduction and move away from their *fast fashion* business model, which would be critical to bring the fashion sector as a whole on a Paris-aligned trajectory. The production of clothing doubled between 2000 and 2015 and consumers discard many items after just seven to ten wears (Morlet *et al.*, 2017). While electrification, switching to renewable energy, and investing in innovative low-carbon materials are crucial measures, they should be underpinned by a shift to a more circular fashion system. However, none of the companies assessed set targets to reduce overproduction (i.e. clothes that are never sold) or to move away from their *fast fashion* business model. While we found some examples of repair, reuse and resale services, the fashion companies in this report implement these measures only at a small scale.

Most food and agriculture companies do not commit to transitioning to plant-based products, which is necessary to reduce the sector's methane emissions.

Increasing the share of plant-based protein is crucial to reduce methane emissions in the food and agriculture sector. The food and agriculture sector is responsible for roughly a third of global emissions (Crippa *et al.*, 2021; Boehm *et al.*, 2023). Even if all sectors would phase out fossil fuels immediately, the global food and agriculture sector could prevent the achievement of the 1.5°C temperature goal (Clark *et al.*, 2020). The most important source of emissions in the sector is livestock, which generates high amounts of methane emissions. Methane is a potent greenhouse gas and has an almost immediate effect on global temperatures, contrary to carbon dioxide, which takes several decades. Due to its short-lived nature, reducing methane emissions can have a *cooling* effect (Collins *et al.*, 2018). Bringing the agricultural and food sector on a trajectory compatible with 1.5°C pathways requires a shift from animal-based to plant-based protein. Other measures that companies can take to reduce methane emissions from livestock include increasing feed quality, improved manure management. synthetic methane inhibitors, and the use of seaweed as a feed additive (Reisinger *et al.*, 2021, p. 7). Section 8.2 provides more information on sectoral transition measures for the food and agriculture sector.

Of the 11 agrifood companies we assessed in this and previous iterations of the CCRM,[3] Danone is the only company to indicate intent to increase the share of plant-based protein. The company states its goal is to "increase the share of revenue from lower carbon products transitioning to a low-carbon product offer as a main source of business" (Danone, 2023b, p. 36). Plant-based dairy alternatives are a key pillar of Danone's "lower-carbon product development strategy" (Danone, 2023b, p. 36). Nestlé also mentions a shift to "low carbon products, such as plant-based foods and drinks" in its Net Zero Roadmap and projects this can lead to emission reductions of 1.4 $MtCO_2e$ by 2030, which equals about 1% of today's emissions (Nestlé, 2023b, pp. 21,23-24). However, Nestlé does not explain what the role of plant-based products vis-à-vis other products will be; the company does not commit to increase the share of plant-based products. We did not identify any reference to the need for an increased share of plant-based proteins in Mars, Tesco, and Walmart's public communications.

Danone is also the only agrifood company to have set a target for methane emissions. Danone commits to reduce methane emissions from fresh milk by 30% between 2020 and 2030 (Danone, 2023c, p. 3). Fresh milk accounts for about 70% of Danone's methane emissions. In its methane strategy, the company presents plans to achieve its methane target through improved herd and feed management, manure management, and innovative feed additives, among others (Danone, 2023c, pp. 7–11). The other 10 agrifood companies that we assessed do not set a target for methane emissions.

3 *These include the CCRM 2022, 2023 and 2024, and a spin-off report assessing climate targets of companies based in the Netherlands.*

2.2 Regulations and technology development driving energy transitions

Summary

Of the five electric utilities assessed, the three European ones (Enel, ENGIE, and Iberdrola) present more ambitious renewable energy and emission reduction targets than Duke Energy and KEPCO, headquartered in the US and South Korea, respectively. Likewise, the three light-duty vehicle manufacturers in this report (Stellantis, Toyota, and Volkswagen Group) provide more ambitious targets for the European market than for other regions. While this report does not delve into the underlying reasons for these differences, it suggests that EU legislation and political commitment may play a significant role in driving more ambitious climate action among some of these companies.

European regulations drive the shift to renewable electricity generation.

The EU committed to increasing the share of renewable *energy* to at least 42.5% by 2030, which means a doubling from 2022 levels (European Parliament and the Council of the European Union, 2023b; Eurostat, 2023). The share of renewable *electricity* would need to increase to 69% by 2030 (European Commission, 2022). In December 2023, seven European countries, including the EU's two largest economies, committed to decarbonise their electricity systems by 2035 (Government of the Netherlands, 2023). The EU Emissions Trading System (ETS) is the Union's key instrument to drive emission reductions in the power sector, but other measures such as subsidies and R&D support also stimulate investments in renewable energy capacity (Bölük and Kaplan, 2022). Policy changes in European member states like Denmark, Germany, and the Netherlands led to a rapid increase in renewable electricity generation in recent years (Boehm *et al.*, 2023, pp. 33–34).

Compared to Europe, the transition to renewables has been slower in the US and South Korea, where Duke Energy and KEPCO are headquartered. The climate strategies of these two electric utilities appear to be in line with national policies. Although the Biden administration announced a target of a carbon free electricity system by 2035 and the share of renewables in the electricity sector is growing, existing policies do not result in penetration levels deep enough to bring the US on track to meet sectoral benchmarks (CAT, 2023d, p. 9). The slower uptake of renewables in the US compared to the EU is due to the existing contribution of nuclear power to the US grids and a lack of policies incentivising the phase-out of oil and gas (CAT, 2023d, p. 9). The US government's proposed emission standards for existing fossil gas facilities do not cover the majority of fossil plants, and the Inflation Reduction Act provides substantial concessions to the fossil fuel industry (CAT, 2023d, 2023f). Duke Energy's climate strategy aligns with national policies – the company plans for nuclear to continue playing an important role in electricity generation and for co-firing of hydrogen and fossil gas (Duke Energy, 2023a, pp. 48–49). Likewise, KEPCO, which is state-run, views fossil gas as a "transitional" fuel and also plans for the co-firing of hydrogen and fossil gas, as well as an expansion of nuclear (KEPCO, 2023, p. 31). This mirrors national policies in South Korea. The South Korean government increased its nuclear power generation target in 2023 and plans to increase the use of liquified natural gas (LNG) in the power sector (CAT, 2023e). The Yoon Suk-yeol administration has dropped South Korea's 100% renewable energy target. While the share of renewables in electricity generation doubled in recent years, it remains small at about 6%, much lower than in countries like the EU, the US, and Japan (CAT, 2023e).

Regulation and financial incentives for consumers to buy EVs may also explain why the light-duty (LDV) manufacturers assessed set more ambitious targets for the EU than for China and the US, and no targets for other markets.

The three LDV manufacturers in this report (Stellantis, Toyota, and Volkswagen Group) set more ambitious targets for electric vehicle (EV) sales shares in the EU than in the US and China. They do not communicate EV sales targets for other regions. As shown in Table 10 above, Volkswagen committed to selling at least 70% electric LDVs in the EU and at least 50% electric LDVs in the US and China by 2030. Stellantis set an electric LDV sales target of 100% in Europe and 50% in the US by 2050; however, the company did not set a target for the Chinese market, where it holds a minor share (<1%) of the car market. Toyota committed to a 50% sales share of battery electric vehicles in the EU and the UK by 2030 and does not present targets for the US and China.

As a result of enabling policies and regulatory requirements, EV sales have reached a breakthrough stage in advanced economies (Boehm *et al.*, 2023, p. 85). In 2022, EV sales for passenger cars reached 29% in China, 21% in the EU, and 8% in the US (IEA, 2023b, p. 16,18,20). Enabling policies, including subsidies for consumers and charging infrastructure rollout, helped accelerate the share of EVs in these three markets. The Chinese government started financial support for new energy vehicles (NEV), which include battery electric vehicles (BEV), plug-in hybrid vehicles (PHEVs), and fuel cell electric vehicles (FCEV), in the 1990s, and subsidy schemes boosted sales shares (CAT, 2023a). While NEV subsidies for producers ended in 2022, consumers can still benefit from tax exemptions until the end of 2027 (CAT, 2023a; Xinhuanet, 2023). Many European governments set up subsidy schemes to incentivise the purchase of electric LDV, but as the market for EVs has matured, they are reducing or changing the nature of purchase incentives (IEA, 2023b, p. 77). Both in China and several European countries, governments are now shifting their financial support from vehicles to charging infrastructure (IEA, 2023b, p. 83). In the US, the Inflation Reduction Act (IRA) incentivises investments in EVs and charging infrastructure (CAT, 2023f; IEA, 2023b).

The European Union pledged more ambitious targets for reducing CO_2 emissions from new cars and vans than the US and China. The EU adopted targets to reduce CO_2 emissions from new cars and vans by 55% and 50% by 2030 and 100% by 2035, compared to 2021 (European Parliament and the Council of the European Union, 2023a). This implies that the overwhelming majority of new light-duty vehicles sold by 2035 will likely be battery electric vehicles, with perhaps a small share of other zero-emission cars. The Biden administration set a goal of a 50% sales share of zero emissions vehicles by 2030 (The White House, 2021), but the US government estimates that LDV EV sales will reach only 22% by 2030 (CAT, 2023f). Some federal states, which together account for about 25% of car sales in the US, go beyond this national target. California was the first to adopt legislation that requires a minimum sales share of EVs of 35% in 2026 and 100% in 2035 (IEA, 2023b, pp. 74–75). China targets a 50% sales share of NEV in "key air pollution control regions", which account for almost 80% of China's LDV market (IEA, 2023b, p. 77). Several regions within China committed to targets that surpass the national level. For instance, Shanghai aims for a 50% of BEVs by 2025.

Section 2.1 showed that the five automotive manufacturers assessed set more ambitious targets for the EU than for other markets. This is likely the consequence of more stringent regulation in the EU, compared to the US and China and IEA (2023b, p. 89). To support the increase of EV sales shares in other markets, especially less mature ones, regulators could adopt legislation on tailpipe emissions or EV sales shares, implement subsidy schemes for consumers buying EVs, and providing financial incentives for investments in charging infrastructure roll-out, among others.

3 Separating real transition pathways from false narratives

3.1 Fossil fuel phase-out and CCUS: limited traction for HLEG recommendations

Summary

Despite being one of the main levers to reduce emissions in the power, automotive, and fashion sectors, only a minority of the companies assessed in our analysis commit to a fossil fuel phase-out. A phase-out of coal and fossil gas is particularly crucial in the energy sector as this is a prerequisite for decarbonising other high-emitting sectors through electrification. Most electric utilities in our analysis address the need to exit coal, but fossil gas is still seen as 'transitional fuels', especially outside Europe. The automotive sector lags in phasing out internal combustion engines. The fashion sector has started to reduce coal from its production processes, but a full commitment is yet to be made. Overall, we find that companies' commitments to phase out fossil fuels largely depend on the regulatory environment at the national and regional levels, as transitioning to alternatives must take place in parallel and requires dedicated incentive schemes.

International consensus on the need to move away from fossil fuels is facing strong resistance and is being countered by powerful vested interests.

The majority of companies with net-zero targets have not committed to fossil fuel phase-out despite the international agreement on transitioning away from fossil fuels in energy systems. Although climate policies focused on the energy sector from the outset, it took several decades for the international community to reach an agreement — albeit weak — on phasing out fossil fuels. At COP27, parties agreed on the necessity to transition away from fossil fuels in energy systems and to accelerate efforts towards the phase-down of unabated coal power (UNFCCC, 2023a, p. 5). Recommendations on fossil phase-out commitments in corporate climate guidelines are also recent and have not yet become widely adopted. An explicit reference to the phase-out of fossil fuels is integrated in the HLEG recommendations (UN HLEG, 2022, p. 24). HLEG recommends phasing out coal for power generation across the entire value chain by 2030 in OECD countries and by 2040 in the rest of the world, as well as ending oil and gas exploration, expansion, and production. However, the explicit requirements for fossil fuel phase-out have sparked controversy due to concerns that they might violate anti-competition regulations, especially in the US (Hearn *et al.*, 2023, p. 33). Therefore, we understand that some corporate initiatives are reluctant to incorporate the HLEG recommendations into their guidelines. The Net Zero Tracker found that the majority of companies with net-zero targets have not committed to phasing out fossil fuels (Lutz, 2023, p. 6).

In the electric utilities sector, commitments to phasing out coal for own generation are in place, but we need clearer plans for phasing out fossil gas — both in electricity generation and sales — and for the electricity purchased for resale.

All electric utilities assessed have planned to phase out coal; however, there are stark differences in their timelines. Iberdrola has already shut down its last coal-powered plants as early as 2020, while Enel and ENGIE have committed to do so by 2027, and Duke Energy by 2035 (although this is contingent on regulatory approvals), with KEPCO committing to phase out coal only by 2050 *(see Table 11)*. European power companies appear to be outperforming their non-European peers for several reasons. Among them, coal is no longer profitable in the EU. Since 2013, European electric utilities have been required to auction their allowances in the EU emissions trading scheme. The recent reform of the scheme as part of the EU Fit for 55 Package has resulted in a rising carbon price, which exceeded €80/tCO_2 in December 2023 (Montel and Ember, 2024). Furthermore, to meet the stricter EU Air Quality Directive in 2021, coal plants owners were faced with the costly decision to either retrofit their facilities with expensive technologies or close their facilities (Wynn and Coghe, 2017). Pressure from investors and NGOs, as well as political will, are also considered significant drivers of change in Europe (Czyżak *et al.*, 2022; Beyond Fossil Fuels, 2024).

Despite the positive steps taken by these companies to phase out coal, a 1.5°C-aligned plan to phase out fossil gas is still missing for four out of five companies. Fossil gas accounts for 36% of Duke Energy's installed capacity, 49% of ENGIE's installed capacity, 21% of KEPCO's installed capacity, and 15% of Iberdrola's own installed capacity (KEPCO, 2022, p. 11; Duke Energy, 2023b, p. 37; ENGIE, 2023, p. 3; Iberdrola, 2023b, p. 101, 2023d, p. 19). Duke Energy and KEPCO will only phase out gas by 2050 (KEPCO, 2022, p. 59,68; Duke Energy, 2023a, pp. 48–49), which is 15 years beyond the advised timeline for developed countries (CAT, 2023b, p. 1). Iberdrola has not publicly announced a comprehensive strategy for complete fossil gas phase-out in its electricity generation and sales. Duke Energy, KEPCO, and ENGIE do not plan to decommission gas-fired power plants after 2030, but instead view gas as "transitional fuels". They also rely on hydrogen blending in gas turbines, view gas as a suitable flexibility option in the decarbonisation of the energy sector and support the use of CCS to extend the life of gas-fired power plants (Duke Energy, 2022, pp. 18, 67, 2023a, p. 43; KEPCO, 2022, p. 64; ENGIE, 2023, p. 66). Only Enel pledges to completely phase out gas in its electricity generation and retail gas sales by 2040, which meets global benchmarks (Enel, 2023a, p.86). While gas phase-out is a major concern, oil phase-out is less critical for most companies in our analysis since it only accounts for an insignificant share of the companies' power generation capacity (KEPCO, 2022, p. 11; Duke Energy, 2023b, p. 37; ENGIE, 2023, p. 3).

Three out of the five companies assessed in our analysis — Duke Energy, ENGIE, and KEPCO — consider resorting to false solutions like CC(U)S or bioenergy (KEPCO, 2022, p. 59,69,76; Duke Energy, 2023a, p. 37,44; ENGIE, 2023, p. 66,98). The reliance on CCUS in electricity generation faces severe risks due to the unproven efficacy and potential environmental impacts of these technologies. Furthermore, CCUS is not yet available at scale and may come at a high cost compared to switching to renewables (Grant *et al.*, 2021). Duke Energy is also exploring decarbonising its scope 3 downstream by tapping into renewable natural gas (RNG) from waste-based feedstocks (Duke Energy, 2023b, p. 31). Similarly, ENGIE considers the role of (decarbonised) gas like biomethane from non-recyclable waste crucial for its transformation. However, their approach to heavy bioenergy reliance potentially overlooks the fuel's negative sustainability implications and distracts the company from investing in renewable generation and supporting electrification in end-use sectors, while prolonging the use of existing fossil gas infrastructure (Saadat *et al.*, 2020).

Table 11: Fossil fuel phase out commitments for electric utilities

COMPANY	NET ZERO OR CARBON NEUTRALITY TARGET	COAL PHASE-OUT IN ELECTRICITY GENERATION	GAS PHASE-OUT IN ELECTRICITY GENERATION	FALSE SOLUTIONS
Paris-aligned 'deadline' *(electric utilities in advanced economies)*	2035	2030	2035	None
Iberdrola	2039	2020	*Not identified*	*None identified*
Enel	2040	2027	2040	*None identified*
ENGIE	2045	2025 (EU) 2027 (globally)	*Not identified*	CCS, bioenergy (biomethane)
Duke Energy	2050	2035	2050	CC(U)S, bioenergy (RNG)
KEPCO	2050	2050	2050	CC(U)S

Sources: KEPCO (2022, pp. 59, 64, 68, 69, 76), Duke Energy (2023a, pp. 29, 37, 43, 44, 2023b, p. 31), ENGIE (2023, pp. 66, 68, 98), Iberdrola (2023f, pp. 1, 87), Enel (2023a, p.86)

In the automotive and fashion sectors, commitments on phasing out fossil fuel are mostly missing or insufficient.

Four of the five automotive manufacturers assessed do not set phase-out dates for internal combustion engines (ICE), which the automotive sector sees as a critical transitional measure. Daimler Trucks is the only company assessed that commits to 100% zero-emissions vehicles worldwide; the heavy-duty vehicle manufacturer aims to reach this milestone in the EU, Japan, and US by 2039, and in the rest of the world by 2050 (Daimler Truck, 2023a, pp. 78, 81). While the other four companies set carbon neutrality or net-zero targets, they do not communicate phase-out dates for ICEs on all of their markets *(see section 2.1)*. However, the global sales share for zero-emission light-duty vehicles must reach 100% between 2035–2040 and earlier in advanced economies (CAT, 2020, p. 27; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93), meaning that ICE sales must be completely phased out by the end of next decade (COP26 Presidency, 2021; SBTi, 2023a, pp. 4–6). A complete phase-out of ICE trucks would need to be achieved between 2045–2050 globally (Boehm *et al.*, 2023; IEA, 2023c).

The fashion companies in our assessment are taking measures to decrease the use of coal in their supply chain but only three committed to a coal phase-out in the production process. Adidas, Nike, and Inditex committed to eliminate coal from the production processes of their materials (tier 2) and finished goods (tier 1) suppliers. Adidas' claims that its suppliers have not installed any new coal-fired boilers, heaters, or power generation system since 2022 and commits to phasing out coal-fired boilers at all finished goods and materials suppliers by 2025 (Adidas, 2024, p. 86). Nike supported its finished goods suppliers in replacing coal-fired steam boilers with electric alternatives in recent years and pledged to eliminate coal from finished goods and material suppliers by 2030 (Nike, 2023, p. 100). Inditex pledged to eliminate the use of coal in their supply chain (tier 1 and tier 2) and to avoid installing new coal-fired equipment from 2023 (Inditex, 2023a). The two other companies – H&M Group and Fast Retailing – do not commit to phase out coal in the production processes within their supply chains. H&M Group states that it will no longer onboard new suppliers that have on-site coal boilers but has not yet presented a timeline for completely phasing out coal in their supply chain (H&M Group, 2023d, p. 26). Fast Retailing merely commits to "leverage our long-standing partnerships to promote measures that will [...] phase out coal and introduce renewable energy at major partner factories" (Fast Retailing, 2023b, p. 56).

Fashion companies' plans to expand biomass use in the supply chain could undermine their commitments to decrease or phase out coal. All five fashion companies assessed use biomass in their supply chain *(see section 3.3)*. Notably, H&M Group presents biomass as a solution to reduce emissions in the supply chain. The Swedish fashion company states that "certain types of biomass can act as a stop-gap solution" for suppliers who have no access to non-combustible renewable energy sources and are connected to unreliable electricity grids (H&M Group, 2023a). However, biomass has severe sustainability implications and is therefore not a credible solution for reducing coal reliance. Section 3.3 discusses this issue in more detail.

Recommendations for scaling up the rate of corporate fossil fuel phase-out commitments

- **Regulators** should enact policies that accelerate the fossil fuel phase-out in the power, fashion, and automotive sectors.
- **Companies** should considerably scale up commitments and present a clear timeline on fossil fuel phase-out. These should systematically be included in companies' transition plans and published in the sustainability report.
- **Standard setters and voluntary initiatives** should formulate more prescriptive corporate guidelines requiring companies to include fossil fuel phase-out requirements in their transition plans. For instance, fashion companies should be mandated to present a timeline for phasing out coal in their supply chain, while car manufacturers should be mandated to present a timeline for phasing out internal combustion engines.

3.2 Renewable electricity procurement: innovative leadership and cheap claims

Some extracts of this section are adapted from a special edition of the Corporate Climate Responsibility Monitor focused on renewable electricity strategies (Mooldijk et al., 2024). The companies assessed in that report are included in the analysis within this section.

Summary

While corporate claims and targets for renewable electricity are increasing, the meaning and impact of these claims vary significantly. Standalone Renewable Energy Certificates (RECs) still play a large role in companies' renewable electricity procurement strategies, but we see that companies are increasingly aware of the limitations of this approach and shifting towards higher quality procurement instruments. There is a rising momentum for hourly matching of renewable electricity, although more support and incentives are needed for companies to adopt this approach. We find that voluntary initiatives and standards currently offer limited incentives for companies to pursue higher quality renewable electricity strategies. The update process for the GHG Protocol's guidance on Scope 2 emissions accounting presents a promising opportunity to realign the standards with transparent and ambitious practices.

Corporate renewable electricity claims and targets are increasing, but all mean different things and their real impact is often far less than implied.

Of the 22 companies[4] included in Table 12, seven companies made some form of 100% renewable electricity claims in 2022, while around half claimed to procure most of their electricity from renewable sources. The RE100 initiative found that its members consumed 50% renewable electricity in 2022 (RE100, 2024), up from 45% in 2020 (RE100, 2023).

While renewable electricity claims are increasing among companies, it is not easy to understand what these claims mean. The landscape of renewable electricity procurement constructs from these companies is highly nuanced due to the differences in the coverage of targets, procurement constructs and the methods for matching renewable generation with consumption (Figure 5), making it difficult to compare the claims directly. Companies investing in higher-quality strategies such as PPAs or utility tariffs with hourly matching are often grouped with those pursuing more accessible claims with limited impact, such as the procurement of standalone RECs with annual matching. Because of the limitations of all these approaches, GHG emissions associated with companies' electricity consumption are often significantly misrepresented.

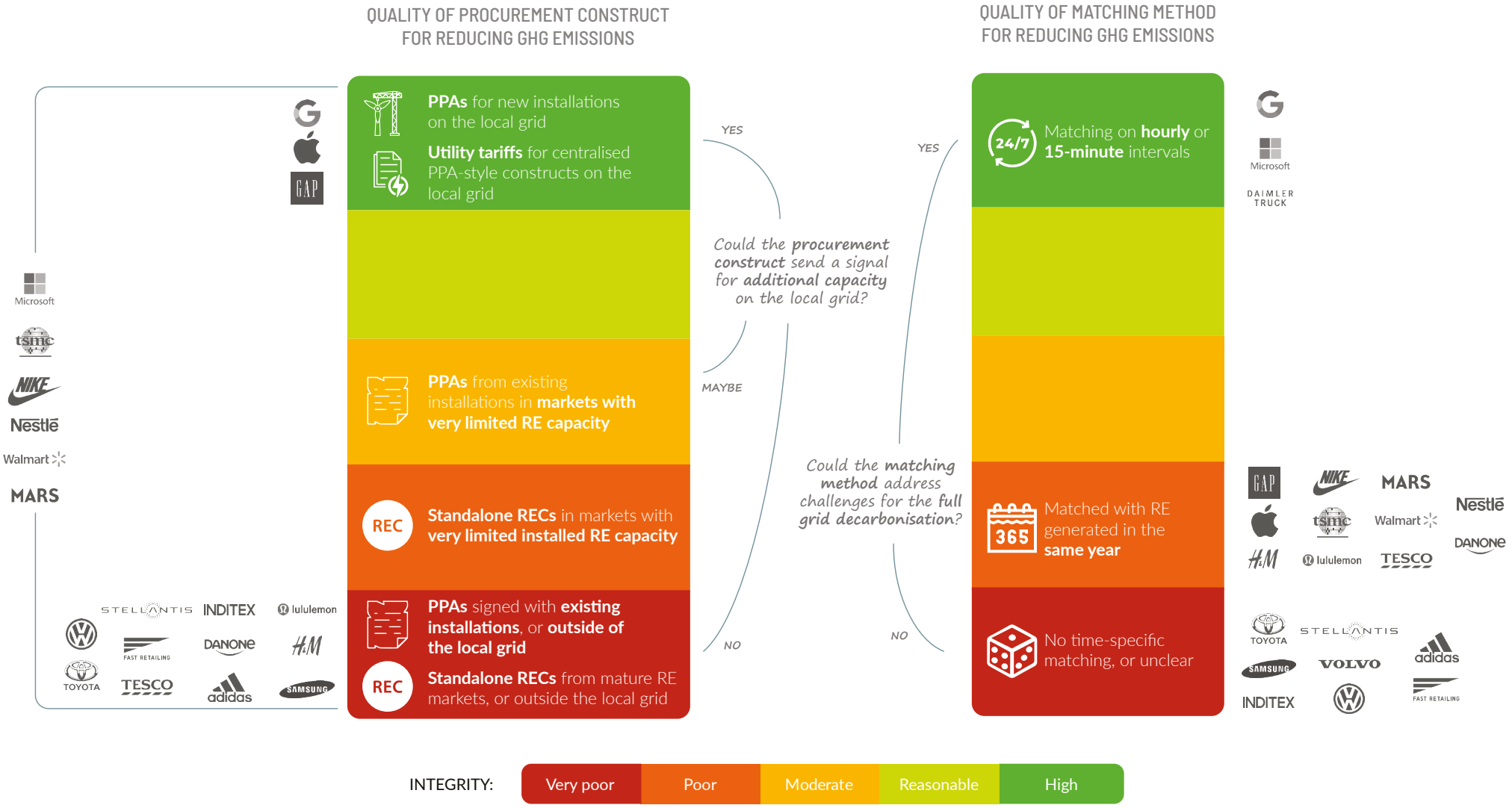
Despite their limitations, standalone RECs still play a large role in companies' strategies for procuring renewable electricity today.

Of the 22 companies included in Table 12, at least 16 use standalone RECs to account for a significant proportion of their renewable electricity claims. For at least 11 of these companies, standalone RECs constitute the *main* method for claiming to procure renewable electricity.

In many cases, this involves the purchase of RECs that may not originate from the same region as where the companies operate. For instance, lululemon procured RECs from Germany to cover its electricity consumption across all EU countries where the company operates (lululemon, 2023). Similarly, H&M Group bought RECs from Norway to cover electricity consumption in its stores in Bulgaria, Cyprus, Greece, and Spain, among others (H&M Group, 2023b). Although the European grid is interconnected, the physical flow of electricity from one country to another is much smaller than the number of RECs traded between countries (Hamburger, 2023). Purchasing Norwegian RECs does not signal demand to the Bulgarian electricity market and carries the risk of implicit double counting, where both the REC buyer and Norwegian grid consumers believe they are using renewable electricity.

4 *Our analysis of renewable electricity procurement excludes electric utilities, but includes the companies covered by the report Navigating the nuances of corporate renewable electricity procurement (Mooldijk et al., 2024).*

Figure 5: Diverse landscape of renewable electricity procurement constructs and matching methods



Source: Authors' own elaboration. The categorisation of procurement constructs is for illustrative purposes only; the integrity of any given procurement construct depends on the specific conditions of that construct and may differ from the indication given by the graphic. The placement of company logos indicates the main approaches implemented by those companies according to the interpretation of the authors. See the Methodology in the Annex for further differentiation between other procurement constructs.

Table 12: Comparison between companies' renewable electricity claims, RE100 membership, and our CCRM integrity assessments.

COMPANY	SCOPE 2 EMISSIONS REPORTED UNDER GHG PROTOCOL GUIDELINES ($MtCO_2e$ 2022)		RENEWABLE ELECTRICITY SHARE CLAIMED IN 2022	RE100 MEMBERSHIP *	CCRM INTEGRITY ASSESSMENT *For renewable electricity procurement*	MAIN RENEWABLE ELECTRICITY PROCUREMENT CONSTRUCTS
	Location-based	*Market-based*				
Food and agriculture						
Danone	0.76	0.28	71%	Gold	Poor	Mostly standalone RECs.
Mars	0.97	0.42	58%	–	Moderate	PPAs and standalone RECs
Nestlé	2.61	0.76	77%	✓	Moderate	PPAs and standalone RECs
Tesco	0.58	0.01	**100%**	✓	Very poor	Mostly standalone RECs.
Walmart	9.98	6.74	47%	✓	Moderate	Mostly PPAs, also standalone RECs.
Fashion						
Adidas	?	0.14	no claim	–	Very poor	Mostly standalone RECs.
H&M	0.46	0.05	**92%**	✓	Moderate	Standalone RECs; plans for more PPAs
Inditex	0.45	Zero	**100%**	–	Moderate	Standalone RECs; plans for more PPAs
Nike	0.22	0.02	**93%**	Gold	Moderate	Local PPAs with annual matching.
Fast Retailing	0.29	0.16	42%	–	Poor	Mostly standalone RECs.
Lululemon **	0.02	Zero	**100%**	✓	Poor	Standalone RECs; plans for more PPAs
Gap **	1.1	0.003	36-57%	–	Moderate	Local PPAs with annual matching.
Automobile manufacturers						
Daimler Trucks	0.59	0.33	no claim	–	?	Not disclosed.
Stellantis	2.55	1.90	27%	–	Very poor	Mostly standalone RECs; plans for PPAs.
Toyota	3.81	2.87	20%	–	Very poor	Not disclosed.
Volkswagen	4.65	2.11	no claim	–	Very poor	Standalone RECs; plans for more PPAs.
Volvo Group	0.18	0.08	48%	–	?	Not disclosed.
Tech and electronics **						
Apple	1.1	0.003	**100%**	Gold	Moderate	Local PPAs with annual matching.
Google	8.5	2.5	**100%**	Gold	Reasonable	PPAs & utility tariffs with 24/7 matching
Microsoft	6.4	0.3	**100%**	Gold	Moderate	PPAs and RECs with 24/7 matching
Samsung Elect.	19.9	9.1	31%	Gold	Very poor	Mostly standalone RECs.
TSMC	10.9	9.5	10%	✓	Poor	Standalone RECs; shift to more PPAs

* Gold memberships for RE100 are available to companies for a premium fee. Companies paying for gold status receive preferential placement and profiling on the RE100 website and at events (Climate Group, 2021). We could not identify any specific technical criteria that companies must fulfil to qualify for this label (aside from criteria for energy producers and financial institutions).

** Lululemon, Gap and the Tech and electronics companies were not assessed in this 2024 Corporate Climate Responsibility Monitor report, but were included in a special edition of the CCRM focused on renewable electricity procurement in January 2024 (Mooldijk et al., 2024)

Companies demonstrate an increasing awareness of the limitations of standalone RECs, and many are planning to shift to higher-quality procurement instruments.

Several companies, including H&M Group, Inditex, lululemon, TSMC and Volkswagen, indicate their intention to transition to Power Purchase Agreements (PPAs) in the coming years, although all these companies currently purchase standalone RECs to cover most of their renewable electricity claims. H&M Group has recently signed PPAs in Spain, Sweden and the United Kingdom, which may account for about a third of the company's current electricity demand once operational (H&M Group, 2023a).

We also see signs that PPAs overtaking standalone RECs as the preferred procurement method in emerging renewable electricity markets. For example, while Samsung and TSMC could have purchased standalone RECs for their operations in South Korea and Taiwan, respectively, neither company has pursued this option; now that PPAs are possible in these countries, Samsung and TSMC show signs of starting to procure renewable electricity through this approach (Mooldijk *et al.*, 2024).

There are also promising signs that some companies are looking for more innovative solutions to overcome the burdens and complexities associated with directly engaging in PPAs, which could increase access to high-quality procurement constructs for other companies with more limited resources. For example, Google and Apple have collaborated with several regional utilities to establish utility-scale programmes through which companies can sign long-term contracts with the utility to manage a portfolio of PPA-style constructs. Gap and TSMC have pursued aggregated PPA constructs, which allows companies to pool their resources and expertise to develop high- quality plans (Mooldijk *et al.*, 2024).

There is growing momentum for matching renewable electricity generation with consumption on an hourly basis, but replication requires support and incentives.

Some companies – including Google and Microsoft – have recognised the limitations of annual matching and are moving to hourly (24/7) matching (Day, Mooldijk, Hans, *et al.*, 2023; Mooldijk *et al.*, 2024). Emerging scientific literature on hourly matching clearly demonstrates that its potential to address the challenges of the electricity system and ultimately decrease emissions is significantly greater compared to annual matching. Annual renewable electricity matching hides a significant embedded reliance on fossil fuel generation. Companies that commit to match their electricity consumption on an hourly basis provide a critical demand pull for additional and novel renewable energy generation and storage technologies that will be necessary to completely decarbonise power systems in the most challenging times and locations.

Across the companies discussed in section B of this report, only Daimler Truck claims to be procuring electricity using a 24/7 accounting method for its production sites in Europe (Daimler Truck, 2023a, p. 94). However, the company provides very little information on what this approach entails, making it difficult for us to assess the integrity of this claim. As of March 2024, the *24/7 Carbon-Free Energy Compact* had 147 (24/7 Carbon-Free Energy Compact, 2024), but most of these entities were either tech companies, power companies, research groups, or consultancies. This indicates that systems for 24/7 procurement are still in a phase of development and may not yet be accessible for every company to implement.

While it might not be realistic for companies to switch to 24/7 accounting overnight, major companies could already commit to transitioning towards this accounting metric in the coming years. To this end, it is critical that major initiatives responsible for accounting guidelines and seeking to mobilise corporate renewable electricity targets – such as the GHG Protocol and the RE100 initiative – integrate 24/7 accounting into their guidance. Companies that currently strive to replicate this good practice approach may find themselves outside the guidelines of these initiatives, potentially without support and recognition.

Voluntary initiatives and standards currently provide limited guidance incentives for companies to strive for emerging best practice in high-quality renewable electricity procurement.

Companies' climate strategies – and the integrity of their leadership credentials – are dependent on high-quality guidelines, standards, and criteria from major international cooperative initiatives and certification schemes. But the most relevant and influential initiatives largely fail to distinguish between the nuanced aspects of renewable electricity accounting (Mooldijk *et al.*, 2024). While the tools developed by the GHG Protocol, RE100, SBTi, and the CDP may have promoted awareness of corporate renewable electricity procurement at the point of their design, the level of detail and differentiation no longer adequately reflect the complexity of corporate renewable electricity strategies that we see from major companies today:

- Neither the GHG Protocol Scope 2 Standard, the RE100 technical criteria, nor the SBTi Net Zero Standard distinguish between procurement constructs such as standalone RECs, PPAs, and utility-scale tariffs.
- None of the major initiatives distinguish between annual and hourly approaches for matching renewable electricity.
- None of the major initiatives provide guidance or specific criteria for accounting for the procurement of renewable electricity in the supply chain, which is the most relevant source of electricity demand for many companies.

Table 12 indicates that – for the companies covered by our analysis – neither the GHG Protocol accounting methodologies nor the RE100 membership criteria offer clear and consistent differentiation between companies that demonstrate real leadership for high-quality renewable electricity strategies and those pursuing much lower-quality approaches.

Our assessments of Google and Microsoft in our separate renewable electricity focus report (Mooldijk *et al.*, 2024) explain how the undifferentiated standards of these initiatives may even pose a *barrier* for companies to adopt emerging

best practices, due to comparative disadvantages. Some companies like Inditex, lululemon, Tesco and Samsung in some regions, are reporting 100% renewable electricity under the minimum criteria of the mainstreamed standards, using annual matching and mostly standalone RECs. Companies that strive for higher-quality PPAs like Gap, Nike or Walmart, and companies who pursue 24/7 matching like Google and Microsoft, are only able to report comparatively lower shares of renewable electricity, although their renewable electricity strategies are more constructive and likely to have a greater impact in reducing emissions. Given the significant influence of these initiatives, the revision of their guidelines and criteria to facilitate such a differentiation may represent one of the most promising and necessary levers for raising the ambition of companies' renewable electricity strategies.

The update process for the GHG Protocol's guidance on Scope 2 emissions accounting presents a promising opportunity to realign the standard with transparent and ambitious practices.

The GHG Protocol began a major revision period in 2023, aiming to publish updated standards to be published in 2026 (GHG Protocol, 2023). After initial consultations, the GHG Protocol published its *Summary of Proposal Submissions Related to Scope 2 Guidance* in December 2023 (WRI and WBCSD, 2023), to be reviewed by a technical working group throughout 2024 and 2025.

This summary of proposals includes some promising elements; in particular, the **following proposals would be of key importance**:

- ✓ **Increasing granularity of renewable electricity matching in time and location**, including **a switch to hourly matching** instead of annual matching.
- ✓ **Increasing the stringency of additionality requirements for renewable electricity procurement constructs.** Options explicitly mentioned for consideration include **restrictions on the use of unbundled electricity products**, which would include standalone RECs.

However, the summary of proposals also includes some elements that could represent a considerable step back for transparency and integrity.

- ✗ The proposal to introduce a new accounting method – labelled 'project-based accounting' – would allow companies to claim reductions in their scope 2 emissions based on emissions avoided from renewable energy projects implemented anywhere in the world, whether inside or outside of the local grid region or market. This proposal appears closely aligned with the *Emissions First Partnership*, initiated by Amazon and with a small group of corporate signatories that includes Meta, Intel, and General Motors. In practice, this would effectively be the same as offsetting with carbon credits, which is a highly contentious proposal for improving the Scope 2 Guidance.

The extent to which GHG Protocol and other major initiatives can foster and accelerate the implementation of higher-quality corporate renewable electricity strategies will largely depend on the decisions made on these three key proposals. Until the publication of the updated standards in 2026, other influential initiatives for corporate renewable electricity procurement, such as RE100, should not wait to align their own guidance and criteria with emerging good practices, recognising the urgency for accelerated action on renewable electricity deployment.

Recommendations for the revision of guidelines and criteria of major initiatives to distinguish between highly significant nuances in corporate renewable electricity strategies

GHG Protocol & RE100: We recommend that the major initiatives adopt a common standard for renewable electricity claims and revise the market-based emission accounting method to differentiate between highly significant nuances in renewable electricity strategies. This means:

- ✓ Count only meaningful renewable electricity procurement constructs; RECs should be understood only as a supplementary accounting tool unless evidence is provided to demonstrate its effectiveness as a standalone procurement construct.
- ✓ Count only renewable electricity generated on the same grid as the electricity consumption it is matched to.
- ✓ Distinguish between annual and hourly accounting methods, with a transition towards hourly matching as the standard approach as soon as practically possible.
- ✓ Provide guidance and criteria on setting supply chain targets and strategies.

3.3 Bioenergy: reliance on unsustainable solutions

Summary

While over half of the companies assessed consider bioenergy in their decarbonisation plans, it is not a credible solution for any of them. Particularly in the fashion sector, plans for switching coal to biomass in the supply chain may significantly undermine seemingly ambitious emission reduction targets – and in some cases render them meaningless. Contrary to popular belief, bioenergy is not an emissions-free energy source, and sourcing biomass is likely to have negative impacts on ecosystems and local communities. Companies that consider themselves climate leaders should refrain from using bioenergy and instead advocate for policy changes in regions where sourcing bioenergy is easier and cheaper than sourcing non-combustible sources of renewable energy.

Companies present bioenergy as part of their emission reduction plans, but in most cases, it is not a credible measure, given that bioenergy is likely to have a range of negative sustainability implications. Over half of the 20 companies assessed use bioenergy in their own operations or their value chain, including all five fashion companies, Stellantis, Toyota, Volvo, and Duke Energy. However, bioenergy is very likely to have negative sustainability implications. These include, but are not limited to, deforestation, biodiversity loss and food insecurity (Kline *et al.*, 2015; Hof *et al.*, 2018; Searchinger *et al.*, 2018; Calvin *et al.*, 2020; Ahmed *et al.*, 2021; Clarke *et al.*, 2022; Hanssen *et al.*, 2022).

Bioenergy is not an emissions-free energy source. Cutting down trees or other plants and burning them to generate energy leads to the release of sequestered carbon. It can take several to hundreds of years to balance out this release of CO_2, depending on the type of trees used (Holsmark, 2012; Mitchell *et al.*, 2012; Ter-Mikaelian *et al.*, 2015; Searchinger *et al.*, 2018). Land used to grow bioenergy crops cannot be used for other purposes, such as directly sequestering carbon (Searchinger *et al.*, 2022). This carbon opportunity cost of land should be factored in when calculating the net impact of bioenergy. While advanced bioenergy may play a minor role in decarbonising hard-to-electrify sectors, such as aviation, the sectors assessed in this report have sufficient alternatives to decarbonise their value chains (Calvin *et al.*, 2020; Clarke *et al.*, 2022).

Bioenergy is a scarce resource, which means companies using truly sustainable bioenergy push others to use non-sustainable bioenergy. Most of the companies assessed in this report claim to use "sustainable" bioenergy. Although it is commendable that companies set sustainability criteria for the bioenergy that they source, using any type of bioenergy at all, which is and will remain a scarce resource, inherently pushes other companies to use non-sustainable biomass.

Companies in the power, automotive and fashion sector use biomass to replace fossil fuels, but these sectors can achieve full decarbonisation using non-combustible renewable energy sources.

Biomass to replace fossil fuels remains a common measure among electric utilities, but is not a credible alternative to ramping on renewable deployment. Of the five electric utilities assessed, Duke Energy and ENGIE have plans for significant biogas sales (Duke Energy, 2023a, p. 56; ENGIE, 2023, p. 11). Duke Energy plans to replace its fossil gas sales with "renewable natural gas" (RNG) and a relatively small share of hydrogen (Duke Energy, 2023a, p. 56). While RNG is mainly sourced from landfills, wastewater, food waste, and animal manure, Duke Energy expects energy crops to become the key resource to produce RNG by 2050 (Duke Energy, 2023a, pp. 53–54). We did not identify further details on where and how these energy crops would be produced, but they are very likely to compete with food production or ecosystem preservation (Kline *et al.*, 2015; Hof *et al.*, 2018; Calvin *et al.*, 2020; Ahmed *et al.*, 2021; Clarke *et al.*, 2022; Hanssen *et al.*, 2022). ENGIE considers biomethane from agricultural and food waste a key solution to decarbonise its gas sales, alongside renewable hydrogen and fossil gas with CCUS (ENGIE, 2023, p. 33), The French utility plans to produce 10TWh of biomethane per year in Europe by 2030, up from its current capacity of 8.3TWh (ENGIE, 2023, p. 11,30). While there may be some scope for producing biomethane from agricultural waste for sectors that are hard to electrify, most end-consumers can electrify or switch to green hydrogen (Calvin *et al.*, 2020; Clarke *et al.*, 2022). Marketing biomethane as an emissions-free option risks exacerbating sustainability issues and delaying investments in non-combustible sources of renewable energy.

Although the five companies assessed in this report do not significantly invest in biomass for electricity and heat generation, various other electricity utilities pursue this option, including EON, RWE, Uniper, and Vattenfall for their European operations (Mooldijk *et al.*, 2022; RWE, 2024; Vattenfall, 2024) For instance, RWE co-fires biomass in its Dutch power plants, and Vattenfall operates a combined heat and power plant exclusively fuelled by biomass. However, as discussed above, bioenergy is not an emissions-free source. Electric utilities that pursue bioenergy for electricity and heat generation contribute – directly or indirectly - to a range of sustainability problems. As Iberdrola and Enel show, non-combustible sources of renewable energy, like solar, wind, and geothermal, are economically attractive *(see section 2.1)*. Further investments in these sources are necessary to decarbonise the energy system within the next decades.

Fashion companies are supporting suppliers to switch to biomass, but this is not a credible alternative to electrification and renewable electricity. All five fashion companies in this assessment work with suppliers who use biomass to generate on-site heat and steam (Zhang, 2023). For example, H&M Group pursues biomass as a key decarbonisation measure in the short term. In its sustainability disclosure in 2021, the company aimed for Cambodia to become the first production country to use 100% biomass boilers (H&M Group, 2022, p. 24). While such targets are missing from its latest sustainability disclosure, supporting

suppliers to transition to "thermal energy from agriculture residues" (i.e. biomass) is still listed as a key reduction measure (H&M Group, 2023d, p. 28). On its *Climate* webpage, H&M Group states that "certain types of biomass can act as a stop-gap solution" for suppliers who have no access to non-combustible renewable energy sources and are connected to unreliable electricity grids (H&M Group, 2023a). Adidas and Inditex also state that they encourage their suppliers to switch to biomass (Inditex, 2023a, p. 205; Adidas, 2024, p. 87). We could not identify any information on the use of biomass in the supply chain in Nike's and Fast Retailing's sustainability reports, but research by Stand.earth has shown that several of these companies' suppliers use biomass for generating heat and steam (Zhang, 2023).

While fashion brands need to phase out coal in their supply chains, replacing it with biomass may distract from energy efficiency improvements and investments in electrification and novel technologies for generating heat and steam, such as green hydrogen and concentrated solar (Ley *et al.*, 2021, p. 21). As those options are not yet viable at commercial scale, large investments are needed to unlock their decarbonisation potential. In addition, a key emission reduction measure that companies can take in the short term is switching to dry processing (tier 2) (Ley *et al.*, 2021, p. 6) This can decrease energy use by around 80%.

It is critical that fashion brands lobby with national governments for a policy environment that is conducive to renewable energy generation and consumption. In many key manufacturing countries, regulatory policies hinder the transition to non-combustible renewable energy sources and incentivise the use of wood for heat and steam production. In Cambodia, for instance, factories are not allowed to generate more than 50% of their electricity demand on site (Flynn and Ball, 2023). Also, wood is cheaper than (renewable) electricity in Cambodia, which makes it economically attractive to use biomass instead of investing in electrification.

Biofuels remain a focal point in the automotive industry but are not a credible alternative to electrification. Three of the five automotive manufacturers assessed – Stellantis, Toyota and Volvo Group – invest in biofuels alongside their electrification efforts. For instance, Stellantis deploys bioethanol-compatible vehicles in the Brazilian market and is set to launch an electric-bioethanol hybrid vehicle model in 2024 (Lara, 2023; Stellantis, 2023a, p. 87). Volvo Group states its intention to produce ICE trucks with "sustainable fuels", including biofuels (Volvo Group, 2023a, pp. 16, 155, 2023b). However, road transport – including heavy duty vehicles - can fully electrify, using battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) (Molliere, 2022; Tol *et al.*, 2022; T&E, 2023). BEVs and FCECs are proven technologies and rapidly improving, which means that negative side effects associated with the mining of critical minerals can be mitigated. Automotive manufacturers that continue to invest in biofuels or synthetic fuels risk delaying the phase-out of vehicles with internal combustion engines.

Despite scientific evidence indicating that bioenergy is not carbon neutral and poses a range of other sustainable issues, the IEA and national governments classify bioenergy as a renewable energy source, placing it on par with wind and solar. The International Energy Agency (IEA) considers "modern bioenergy", which excludes biomass used for cooking and heating with open fires or simple stoves, as an import source of renewable energy (IEA, 2024). The IEA Net Zero scenario forecasts an annual increase of 8% in the use of modern bioenergy for *energy* generation between 2022 and 2030 and a doubling of biomass use for *electricity* generation in the same period (IEA, 2023c, 2024). The IPCC guidelines state that countries should report emissions from bioenergy in the Agriculture, Forestry and Other Land Uses (AFOLU) sector rather than in the energy sector (IPCC, 2019). This creates a perverse incentive for countries to import and burn biomass for energy generation because they are allowed to report zero emissions from energy generation. It may explain why certain countries provide substantial subsidies for bioenergy generation. The European Renewable Energy Directive considers bioenergy a renewable energy source and various member states encourage electric utilities to co-fire woody biomass in power installations (European Parliament and the Council of the European Union, 2023b). Bioenergy accounts for over half of the renewable electricity generation in the EU (European Commission, 2023), which implies that the actual reduction of CO_2 emissions from energy generation is less than what the EU claims it to be. Biomass also plays a key role in the UK Government's energy policy and aspirations to achieve net zero emissions by 2050 (Department for Energy Security & Net Zero, 2023). The Drax power plant in North Yorkshire is the UK's largest power plant *and* the world's largest biomass installation, with an annual generation of 14 terawatt-hours (TWh) (Drax, 2024).

Recommendations for avoiding an unsustainable reliance on biomass in corporate climate strategies

Companies: Companies should take the following measures to avoid negative sustainability implications from the use of bioenergy:

- Phase out bioenergy if alternatives exist or will likely become available in the near future.
- For sectors that will rely on bioenergy to some extent (e.g. aviation), present a very clear plan of criteria to source bioenergy and ensure that negative impacts are minimised.
- Advocate for policy changes to ensure that (renewable) electricity is more economically attractive than biomass.

Voluntary initiatives: To provide companies with better guidance on the use and avoidance of bioenergy, voluntary initiatives should:

- Develop corporate guidance to account for emissions from bioenergy.
- Explicitly exclude bioenergy from the list of "renewable energy" sources.
- Require companies to commit to switching to non-combustible renewable energy sources (e.g. wind, solar, geothermal).

Regulators: Due to existing regulations, companies get a perverse incentive to switch to bioenergy instead of non-combustible sources of renewable energy. Regulators should:

- Not label bioenergy as a sustainable renewable energy source on par with non-combustible renewable energy sources energy (e.g. wind, solar, geothermal).
- Remove regulatory hurdles to the procurement of non-combustible sources of renewable energy (e.g. wind, solar, geothermal).

IEA and IPCC: Should reconsider the labelling of and accounting rules for bioenergy, as the current terminology and labelling provide countries and companies with a perverse incentive to prioritise bioenergy over non-combustible renewable energy sources.

3.4 Offsetting 2.0? Agrifood companies' use of land sequestration CDR in the value chain

Summary

Carbon dioxide removals (CDR) are crucial to reach net-zero emissions globally by mid-century. In the food and agriculture sector, land sequestration CDR measures can contribute not only to climate change mitigation but can also support biodiversity and reduce reliance on chemical inputs and pesticides. However, companies in the food and agriculture sector are currently counting on land sequestration carbon dioxide *removals* within their value chain to meet significant portions of their emission *reduction* targets, sometimes referred to as 'insetting'. Besides major uncertainties around the permanence and potential of land sequestration CDR, the aggregation of removals and emission reductions is hiding a lack of commitment and progress towards the necessary agricultural transitions for reducing emissions from highly challenging sources. As a first step towards addressing the existing ambiguity, companies could set emission reduction targets for specific agricultural emission sources, if it is not yet feasible for companies to completely disaggregate removals from emission reductions for all agricultural sub-sectors. Organisations developing benchmarks, target validators and standard setters can contribute to this practice by providing additional guidance covering emission reduction requirements for specific agricultural emission sources.

Is the term 'insetting' on the way out? Fewer companies refer to the buzzword in their climate strategies, but the same practices persist under different descriptions. 'Insetting' is a business-driven concept and refers to offsetting within the value chain. The term 'insetting' is predominantly used in the food and agriculture sector, mainly involving land sequestration carbon dioxide removals (CDR) within the value chain. Food and agriculture companies assessed in this iteration of the CCRM no longer refer to the term 'insetting', but describe the same practices using different terms. For instance, Nestlé refers to "carbon scope 3 removals" (Nestlé, 2023b, p. 44).

Enhanced land sequestration CDR is crucial for reaching global temperature targets, especially in the food sector…

There are clear signs that land sequestration CDR is becoming an increasingly key strategy in the food and agriculture sector. Four of the five assessed food and agriculture companies mention some form of land sequestration CDR in their climate strategy, with some companies making these measures a central component. The mitigation potential and feasibility of land sequestration CDR measures remain uncertain, but they can significantly contribute to mitigating emissions (Costa *et al.*, 2022; Boehm *et al.*, 2023, p. 126). In 1.5°C-aligned pathways, global residual emissions mainly persist in the food and agriculture sector since reducing agricultural emissions – in particular methane and nitrous oxide – to zero is not feasible with currently available technologies and practices. Therefore, CDR will play an important role – on a global scale – to balance out the significant residual emissions from the sector. However, the required ratio of emission reductions versus removals in companies' climate strategies remains uncertain. In addition to removing carbon dioxide, practices related to land sequestration CDR in the agriculture sector can increase biodiversity and reduce reliance on chemical inputs and pesticides while maintaining agricultural productivity in a changing climate (Boehm *et al.*, 2023, p. 126).

…but, in parallel to enhancing CDR practices, food and agriculture companies need to pursue sectoral transitions to achieve deep emission reductions. While the increased attention on CDR measures is a positive development, they should not be seen as an alternative to emission reductions that must also be achieved and require a more fundamental and carefully planned transition. Although residual emissions in the sector will mainly consist of methane and nitrous oxide, the volume of those GHGs also still need to reduce drastically and rapidly. We find that some companies in the food and agriculture sector treat emission reductions and land sequestration CDR within the value chain interchangeably in their plans for meeting targets, making their targets incomparable *(see Table 13)*. From most of the companies we assess, we see limited signs of measures that can lead to significant emission reductions in the sector: the practice of aggregating removals with emissions can obscure the lack of progress in the agriculture transition, especially with regards to reducing methane from livestock and nitrous oxide emissions from fertilisers, which are some of the most important yet challenging emission sources for the sector to address. Land sequestration CDR is not comparable to emission reductions from a climate perspective. Land sequestration CDR is associated with no to limited permanence: there is a very high likelihood of re-release of the carbon dioxide into the atmosphere within years or decades (Deprez *et al.*, 2024). For example, lands could be mismanaged, and forests can be subject to wildfires. For CDR to effectively substitute emission reductions, carbon storage must be guaranteed for centuries (Wang *et al.*, 2023). Agricultural emissions also need to be significantly reduced in the decade of critical climate action: land sequestration CDR needs to happen in addition to deep emission reductions.

Despite the shortcomings described above, the Science-Based Targets initiative's (SBTi) Forest, Land and Agriculture (FLAG) guidance allows for an undefined and potentially substantial role of land sequestration in achieving emission reduction targets. SBTi's FLAG guidance describes that removals on land owned or operated by a company or within a company's value chain can count toward achieving a FLAG target (SBTi, 2023b, p. 34), but does not specify to what extent. Although the FLAG guidance states that historical emissions and removals need to be reported separately, it does not call for separate targets. Neither the SBTi FLAG guidance nor SBTi's Net Zero Standard specifies the share of land sequestration CDR allowed for emission reduction targets.

Separate emission reduction and emission removal targets would significantly increase transparency and reduce ambiguity of food and agriculture companies' climate strategies; benchmarks for the food and agriculture sector should also call for a clear distinction between these targets. The food and agriculture sector is one of the sectors with significant residual emissions by mid-century in the global 1.5°C-aligned emission pathways, and CDR from land

sequestration are pivotal in achieving net-zero and eventually net-negative emissions. However, food and agriculture companies, as well as some existing sectoral benchmarks, currently do not set out a transparent vision for the role of emission reductions vis-à-vis removals in the sector. Further research is required to clarify what appropriate pathways would be and how to account for them. Ultimately, food and agriculture companies' targets would become substantially more informative and constructive with the clear separation of emission removals from emission reductions.

Additional emission reduction targets for some specific agricultural emission sources could help alleviate the ambiguity of targets, especially if it is not yet feasible for companies to completely disaggregate removals from emission reductions for all agricultural sub-sectors. With the current state of reporting guidance, measurement tools and protocols, as well as scientific benchmarks covering food and agriculture and land sequestration CDR, it is indeed challenging to separate the removals from reductions in emissions accounting in some agricultural subsectors. However, there are also highly significant agricultural emission sources for which this disaggregation is possible. If it is not yet feasible to require companies to set separate FLAG targets for removals and emissions, target validators and standard setters could ask companies set additional emission reduction commitments for specific emission sources where possible and highly relevant. For example, in addition to its overarching FLAG target, **Danone has set an additional and more specific target for reducing methane emissions** from fresh milk *(see Danone, p.118)*. Ultimately, such additions would clarify the meaning of companies' overarching targets and guide the sector into a more fundamental transition, which requires deep emission reductions and – for some emission sources – fundamental changes to the business model.

Insetting – or land sequestration CDR within the value chain – often resembles offsetting practices, but with fewer control mechanisms. In addition to the previously mentioned concerns, insetting practices often represent a mixed bag of activities that can range from being genuinely within the value chain to resembling offsetting practices. Improved soil treatment to enhance carbon sequestration of agricultural land would be an example of CDR within the value chain. But companies also, for example, may engage in activities like tree planting in proximity to crop production. Although this measure takes place close to the value chain activities and related measures, it can be viewed as offsetting due to uncertain link to the actual value chain. In addition, there is a lack of control mechanisms for insetting in place. In many cases, it remains unclear who is responsible for the quality control, accounting, and external validation.

Table 13: Role of CDR towards the FLAG emission reduction targets of agrifood companies

COMPANY	FLAG TARGETS	ROLE OF CDR IN FLAG TARGETS	TRANSPARENCY *(long-term targets)*	INTEGRITY *(long-term targets)*	INTEGRITY OF MEASURES UPSTREAM SCOPE 3 *(mainly agricultural emissions)*
Danone	Net zero by 2050, including a reduction of: • FLAG emissions by 30% by 2030 • non-FLAG emissions by 42% by 2030 • all emissions by 67.7% by 2050 (implicit only).	We assume that the 67.7% emission reduction component **does not include CDR** within the value chain, since: • Those measures are described under Danone's plans for neutralising its 22.3% residual emissions • Danone also commits to a specific methane reduction target.	Poor 67.7% emission reduction commitment is only implicit.	Moderate The emission reduction commitment meets some benchmarks.	Reasonable Plans to increase revenue share stemming from plant-based protein. Understood as increase in plant-based protein and decrease in animal-based protein production.
Mars	Net zero by 2050, including a reduction of: • FLAG emissions by 46% by 2030 and 72% by 2050 • non-FLAG emissions by 42% by 2030 and 90% by 2050	Mars explicitly states that target realisation for 2030 **does not include CDR** within the value chain, but the potential role of CDR 2050 is not explicit.	Moderate Potential role of CDR for long-term not entirely clear.	High The emission reduction commitment meets benchmarks.	Moderate Range of measures until 2030 that can bring about significant emission reductions, but no information on measures after 2030; no measures identified that contribute to the agriculture transition after 2030. Explicitly no role of CDR until 2030.
Nestlé	Net zero by 2050, including a reduction of: • FLAG emissions by 50% by 2030 and 75% by 2050 • non-FLAG emissions by 50% by 2030 and 90% by 2050	Nestlé's Net Zero Roadmap indicates a **major role for land sequestration CDR in its value chain towards its emission reduction targets**: the 2030 targets translate to just 16-24% emission reduction commitment across all value chain emissions, while CDR measures and scope exclusions make up the gap to 50%. The potential role of CDR for 2050 is not explicit.	Poor The emission reduction commitment is far from what the communicated pledges imply.	? Unknown The integrity of the long-term target is unclear because of the significant role of CDR measures.	Poor Measures until 2030 include a mixed bag of land sequestration CDR and emission reductions. No measures identified that contribute to the agriculture transition after 2030.
Tesco	Net zero by 2050, including a reduction of: • FLAG emissions by 39% by 2032 and 72% by 2050. • non-FLAG emissions by 55% by 2032 and 90% by 2050.	Tesco does not specify whether and to what extent its FLAG targets are dependent on CDR, and does not commit to other specific targets for agricultural non-CO_2 emissions. **It is not clear to what extent Tesco plans to reduce its agricultural emissions.** However, Tesco's non-FLAG emissions account for the majority of its footprint, and the targets here indicate a commitment to deep decarbonisation of these emission sources.	Poor Target scope exclusions only presented in CDP disclosure. No information on role of CDR provided.	Moderate FLAG emission target unclear, but non-FLAG emission target accounts for majority of the company's emissions.	Very poor Little to measures identified that will lead to deep emission reductions. No measures identified that contribute to the agriculture transition after 2030.

Recommendations for disaggregating CDR and emission reductions in agriculture

Recognising that carbon dioxide removals are not an equivalent substitute for the reduction of agricultural methane and nitrous oxide emissions but rather an important additional objective:

- **Benchmarks, standards and guidance (e.g. SBTi FLAG guidance):** The existing benchmarks and guidance documents for the food and agriculture sector need to call for separate emission reduction and carbon dioxide removal targets. Realising the accounting tools and mechanisms are highly limited and pose a significant challenge to this, a first step towards separating removals from reductions would be to require additional emission reduction targets for specific emission sources. Guidance documents and benchmarks should emphasise the need for emission reductions, underlining the necessity for the agricultural transition.
- **Food and agriculture companies** should set clear emission reduction targets and specify what share of their net-zero targets will be realised with removals versus reductions, communicating transparently about the challenges the sector faces, including the relatively high volume of residual emissions.

3.5 Neutralising residual emissions: allocation of scarce carbon dioxide removal potential

Summary

Companies' reliance on carbon dioxide removals to fulfil their net-zero targets is too high compared to what their residual emissions should be. Furthermore, they mostly rely on land sequestration CDR, which carries a high risk of non-permanence. High-quality CDR is a scarce resource, which means that a strict definition of residual emissions is needed, ideally at regulatory level or within existing corporate guidelines. Separate targets for emission reduction and carbon dioxide removal could offer a more credible and constructive approach compared to overarching net-zero targets.

Though transparency on the role of CDR in long-term strategies is often lacking, we observe that companies tend to excessively rely on them to achieve their climate neutrality targets.

Out of the 37 companies listed in Table 14, 13 are transparent about their reliance on CDR technologies to achieve their net-zero target, while 24 do not report the share of CDR they rely on. For five companies, it is not clear whether they rely on CDR or not.

For 12 out of the 13 companies that do report on CDR, we observe a high overall reliance, with CDR accounting for more than 9 percent of their 2019 emissions. However, such reliance is deemed inappropriate due to scarcity and the risk of mitigation deterrence. Except for the agriculture sector, long-term targets across all sectors should reach 94% to 100% reductions (SBTi, 2023d, p. 28).

Furthermore, land sequestration CDR is the most frequently type of CDR mentioned by companies (seven out of 10 reporting on the type of CDR they plan to use), although it faces significant challenges of non-permanence. Additionally, these plans for land sequestration CDR neutralisation are *in addition* to the biological neutralisation already included within the supply chain in the agriculture and land use sectors, mentioned in the previous section.

Table 14 indicates that there is no clear improvement in how companies communicate their neutralisation plans since the first CCRM two years ago.

Table 14: Companies' plans for claiming the neutralisation of their emissions towards net zero or carbon neutrality targets

COMPANY	TARGET	RELIANCE ON CDR	MAIN TYPE OF CDR	INTEGRITY
Companies for which the role of CDR towards net zero or carbon neutrality targets can be reasonably determined				
H&M Group	Net zero emissions by 2040	~ 10% of 2019 emissions	DACCS	Reasonable
Holcim	Net zero emissions by 2050	< 10% of 2019 emissions	Passive carbonation	Reasonable
Maersk	Net zero emissions by 2040	~ 10% of 2019 emissions	Land sequestration CDR	Moderate
Iberdrola	Net zero emissions before 2040	~ 9% of 2019 emissions	Land sequestration CDR	Very poor
Apple	Carbon neutrality by 2030	~ 36% of 2019 emissions	Land sequestration CDR	Very poor
Engie	Net zero carbon by 2045	~ 14% of 2019 emissions	*Unclear*	Very poor
Google	Net zero emissions by 2030	~ 50% of 2019 emissions	*Unclear*	Very poor
Ahold Delhaize	Net zero emissions by 2050	~ 18% of 2019 emissions	*Unclear*	?
Enel	Zero emissions in 2040	< 2% of 2019 emissions	*Unclear*	?
Inditex	Net zero emissions by 2040	~ 11% of 2019 emissions	*Unclear*	?
Nike	Net zero emissions by 2040	~ 9% of 2019 emissions	*Unclear*	?
Stellantis	Net zero carbon by 2038	~ 9% of 2019 emissions	*Unclear*	?
ThyssenKrupp	Climate neutral by 2050	~ 9% of 2019 emissions	*Unclear*	?
Companies providing no details on the role of CDR towards net zero or carbon neutrality targets				
Adidas	Climate neutral by 2050	*Unclear*	*Unclear*	?
Amazon	Net zero carbon by 2040	*Unclear*	Land sequestration CDR	?
American Airlines	Net zero emissions by 2050	*Unclear*	*Unclear*	?
Deutsche Post DHL	Net zero logistics by 2050	*Unclear*	*Unclear*	?
Duke Energy	Net zero carbon by 2050	*Unclear*	*Unclear*	?
Fast Retailing	Carbon neutrality by 2050	*Unclear*	*Unclear*	?
Foxconn	Net zero emissions by 2050	*Unclear*	*Unclear*	?
JBS	Net zero emissions by 2040	*Unclear*	*Unclear*	?
Mars	Net zero emissions by 2050	*Unclear*	*Unclear*	?
Mercedes-Benz	Carbon neutrality by 2039	*Unclear*	*Unclear*	?
Microsoft	Carbon negative by 2030	*Unclear*	Technical CDR	?
Nestle	Net zero emissions by 2050	*Unclear*	Land sequestration CDR	?
PepsiCo	Net zero emissions by 2040	*Unclear*	*Unclear*	?
Tesco	Net zero emissions by 2050	*Unclear*	*Unclear*	?
Daimler Trucks	Carbon neutral by 2050	*Unclear*	*Unclear*	?
KEPCO	Carbon neutral by 2050	*Unclear*	*Unclear*	?
Toyota	Carbon neutral by 2050	*Unclear*	*Unclear*	?
Volkswagen	Carbon neutral by 2050	*Unclear*	Land sequestration CDR	?
Volvo Group	Net zero emissions by 2040	*Unclear*	*Unclear*	?
Companies where neutralisation plans are unclear because targets cover only selected emission sources				
Arcelor Mittal	Net zero emissions by 2050	*Unclear*	*Unclear*	?
Carrefour	Carbon neutrality by 2040	*Unclear*	*Unclear*	?
Danone	Net zero emissions by 2050	*Unclear*	Land sequestration CDR	?
Samsung Electronics	Net zero emissions by 2050	*Unclear*	*Unclear*	?
Walmart	Zero operational emissions by 2040	*Unclear*	*Unclear*	?

Table includes the 37 companies included in the sample of the 2023 and 2024 editions of the CCRM

High-quality CDR is a scarce resource, which means that a strict definition of residual emissions is needed, ideally at regulatory level or, at the very least, within existing corporate guidelines.

Multiple issues related to the mitigation hierarchy, non-permanence of carbon storage, scarcity of storage potential, and environmental damages require strict regulation of CDR by national governments. The mitigation hierarchy prioritises emissions reductions. Emissions reductions and removals are not equivalent (Zickfeld *et al.*, 2021). Removals cannot reverse the effects of climate change caused by emissions, and even technical removals with a higher permanence are not equivalent to emissions not occurring in the first place, as they would need unachievably high liability guarantees and continued monitoring, reporting, verification (MRV).

The permanence of carbon dioxide removals must be guaranteed over a timeframe of centuries to millennia. The release of previously sequestered carbon negates any benefits of the sequestration: at the point at which the carbon dioxide is released, the atmospheric concentration of carbon dioxide is restored to the same value that it would have been had the CDR activity never taken place.

Scarce sustainable carbon dioxide removal potential must be reserved for balancing out residual emissions in sectors where the technical mitigation potential of existing technologies remains very limited, for it to remain possible to achieve global net-zero emissions. The challenges of permanence and scarcity are explained in more detail in section 4.1.3 of the Methodology Version 4.0 (NewClimate Institute, 2024).

The allocation of scarce CDR potential across companies is a challenging task, which is why CDR should be treated as a public good rather than something for companies to claim as their own. The allocation of scarce resources must align with global net- zero goals and adhere to a CDR hierarchy, rather than being on a first-come, first-served basis (Deprez *et al.*, 2024). Ideally, governments would set separate targets for emissions reductions and CDR based on a very strict definition of residual emissions. They could then allocate the scarce CDR potential to sectors and companies in need, based on the CDR hierarchy and supported by rigorous MRV and liability requirements. We observe the emergence of legislation regarding the use of CDR, with requirements on CDR volumes to achieve net zero at the national level. For example, the proposal for the EU's 2040 target by the EU Commission includes different scenarios on removals depending on the target level (European Commission, 2024, p. 6).

The key issue of scarcity is not well addressed in currently available guidelines for corporate climate target setting. Existing corporate guidelines like the Oxford Principles for Net Zero Aligned Carbon Offsetting, the SBTi Corporate Net Zero Standard and the ISO Net Zero Guidelines, address the issue of demand for removals by defining residual emissions. The ISO standard defines them as GHGs that remain "after taking all possible actions" (ISO, 2022). The SBTi provides figures on long-term science-based targets at sectoral level (SBTi, 2023d, p. 28), showing varying demand for removals across sectors. However, none of the standards address the challenge of matching this demand with the supply of high-quality removals. There is no assessment regarding the scarcity of high-quality removals, and it remains unclear whether their definition of residual emissions or their assumptions about demand match with the actual supply. Corporate guidelines on net zero should address this challenge in the future, just as they are increasingly addressing the issue of permanence of removals.

Based on these issues, we conclude that it could only be credible for companies to complement their emissions reductions strategy with removals under specific conditions. This should be based on a strict definition of residual emissions and the use of only carbon dioxide removals with a high likelihood of sufficient permanence. Scarce potential and environmental damages mean that CDR measures cannot be considered a credible alternative to emissions reductions for emission sources that could feasibly be eliminated.

Separate emission reduction and carbon dioxide removal targets may be a more credible and constructive approach compared to net-zero targets.

We find that it is more credible for corporates to set three separate types of targets for emission reductions, land sequestration removals and industrial removals, without neutralisation claims. There is already extensive literature on the benefits of separate targets for emissions reductions and removals (McLaren *et al.*, 2019). The separation approach applies to targets but also underlines the difference in timelines for emissions reductions (most urgent) and removals (needed for residual emissions at the end of a mitigation journey). The approach implies that a set of different policies and measures as well as MRV systems are needed for each of them, with the aim to increase environmental integrity.

Going further and splitting the target on removals into two different targets for permanent and for non-permanent removals is only a logical further step. This introduces different currencies on intrinsically different units, reinforces the mitigation hierarchy, and emphasises that counterbalancing emissions with removals entails different types of risks.

Removals are best financed by instruments other than the carbon markets, as these tend towards the cheapest options available.

The voluntary carbon markets are not the right instrument to channel funding for CDR. The integration of emission reductions and removals (with different degrees of permanence) into a single system means that removals are very likely to be used to offset emissions. This contradicts the principle that emission reductions and removals are not equivalent. Furthermore, carbon markets tend to invest in low-hanging fruits and cheap (low-quality) credits, whereas technical removals are one of the most expensive options existing today. The results of our analysis show that companies not only tend to overly rely on large volumes of CDR, but the majority of those which specify also rely on land sequestration CDR with high risks of non-permanence. On the voluntary carbon markets, these types of CDR are traded at much lower prices than other types of removals (Christie-Miller and Harvey, 2022). The supply of removals on these markets could be inflated by the lack of quality criteria, particularly on permanence, which would provide greater scope for emissions increase and delay emissions reductions.

Therefore, we find it is preferable to channel support for carbon dioxide removals through other instruments, for example, by implementing climate contributions, using auctioning revenues from existing carbon pricing mechanisms, establishing procurement schemes, or putting other obligations directly on companies (De Simone, Fabiola; Stoefs, 2023, p. 31).

Recommendations for the appropriate allocation of scarce CDR potential for neutralising residual emissions

- **Regulators and corporate guidelines on net zero** should require companies to set three separate types of targets for emission reductions, land sequestration removals and industrial removals without neutralisation claims, and to report transparently on volumes and quality criteria set for biological and industrial removals.
- **Regulators and corporate guidelines on net zero** should limit the concept of residual emissions to sectors where the technical mitigation potential of existing technologies remains very limited. They should also address the issue of scarcity of high-quality removals and include a scientific assessment on whether their assumptions on demand for removals match the supply.
- **Companies** should not source their removals through the voluntary carbon markets but through other instruments. If these instruments do not exist yet at national level, companies should advocate for the introduction of a robust scheme on removals that is compatible with global net zero.

4 Where next for corporate climate accountability?

4.1 From carbon neutrality claims to more constructive climate contributions

Summary

As of 2023, only a minority of the companies assessed currently use carbon credits to make potentially misleading carbon neutrality claims, with some even moving away from such claims. European business consultancies and carbon credit sellers are also transitioning away from carbon neutrality labels. In the EU, legislators and advertising ombudsmen are ruling against carbon neutrality claims in the European Union, though similar developments have yet to materialise in other regions. Such developments significantly improve the transparency of companies' climate communications. Climate contributions – finance provided by a company to support climate change action without claiming to neutralise its own emissions – may be a more constructive model to scale up voluntary climate finance. Despite this, only a small number of the companies in this report are contributing to climate change mitigation beyond their value chains without claiming neutralisation of emissions, and the volumes of support from these companies remain modest. New guidance including SBTi's 2024 report on beyond value chain mitigation (BVCM) constitute concrete steps towards operationalising and mainstreaming climate contributions, but there remains a lack of specificity on the claims that companies can and cannot make based on the contributions they provide. In 2024, details on claim terminology and potential finance recipients need to be clarified to enable companies and consultancies to move forward with this approach.

Voluntary climate finance from corporates could significantly contribute to financing climate action where resources are limited, especially in developing countries. Historically, corporate climate finance has largely been generated through the voluntary carbon markets. In these markets, companies typically purchase carbon credits derived from emission reduction projects around the world to claim that their own emissions have been offset. But mechanisms for scaling up voluntary climate finance should not undermine transparency and incentives for companies to prioritise necessary measures for deep reductions in their own emissions. This section explores the signals that carbon neutrality claims may be on their way out and assesses progress in operationalising climate contributions as an alternative model to scale up voluntary climate finance.

The beginning of the end for unsubstantiated carbon neutrality claims?

Only a minority of the companies assessed currently claim that their businesses or specific products are carbon neutral, and some companies are moving away from such claims while continuing to contribute voluntary climate finance. Among the 20 companies assessed in section B of this report, only four – Daimler Truck, Danone, Mars and Volkswagen – reported in 2022 or 2023 that certain products or aspects of their businesses were carbon neutral, achieved through the use of carbon credits.

Table 15 shows why we have rated all of these claims to be of *very poor* or *unclear* integrity: each claim applies to only a fraction of the respective company's emissions, and none of the companies provide evidence that the carbon credits they procure are of sufficiently high quality to be considered equivalent to reducing the company's own emissions *(see also Methodology section 4.1.2 regarding the limitations of carbon credits for offsetting claims)*.

The remaining 16 companies assessed in section B of this report did not make any form of carbon neutrality claim in 2022 or 2023, although several of these companies have made such claims in the past. Nestlé announced in 2023 that it would move away from carbon neutrality claims based on offsets at the group and brand level (ESG Today, 2023), although the company indicates that some of its brands continue to purchase carbon credits for their "consumer engagement strategy", without specifying the exact claims associated with those credits (Nestlé, 2023b, p. 41). Evian – a major brand of Danone – also announced in 2023 that it will not seek recertification of its carbon neutrality label after 2023 (Evian, 2023), although Danone continues to make modest contributions to climate change mitigation beyond its value chain *(see further details below)*. Nike, Stellantis, and Volvo Group previously procured carbon credits to make carbon neutrality claims but no longer make such claims. Other major companies such as easyJet and Gucci also publicly announced a move away from offsetting and carbon neutrality claims in 2023 (Carbon Herald, 2023). Google and Microsoft – both of which received a *poor* rating for the integrity of their carbon neutrality claims in the *2023 Corporate Climate Responsibility Monitor* – appear to be quietly shifting away from these claims. We could not identify any new references to their previously prominent carbon neutrality claims on their websites or public reports in 2023, even though both companies still appear to procure carbon credits equivalent to their scope 1 and 2 emissions. However, not all companies are moving in the same direction: by contrast, Apple stepped up its carbon neutrality narrative with the announcement of its carbon-neutral smart watches in 2023 *(see reaction; NewClimate Institute, 2023b)*.

Table 15: Integrity of carbon neutrality claims identified from the companies assessed in this report

WHAT IS THE CLAIM?	AND WHAT DOES THE CLAIM REALLY MEAN?	
Daimler Truck *claims that its "European production plants are CO_2-neutral on balance".*	Daimler Truck's claim covers all production sites in Europe (Daimler Truck, 2023b, 2023a, p. 78, 2024, p. 84). It is based on an unspecified combination of efficiency measures, the procurement and generation of renewable electricity, and the procurement of carbon credits (Daimler Truck, 2023b). The company reports to procure only Gold Standard verified carbon credits but mostly refers to carbon crediting projects for renewable electricity generation (Daimler Truck, 2023a, p. 94, 2024); the additionality of such low hanging fruit projects is highly contentious (see Methodology section 4.1.2).	? Unclear integrity
Danone *claims carbon neutrality for some production sites.*	Danone asserts that it *"builds its net zero commitment around the carbon neutrality of its production sites"* (Danone, 2023a, p. 152). While the report is ambiguous about the coverage of this claim, other sources indicate that six of Danone's production facilities are certified by the Carbon Trust as carbon neutral (Danone, 2022). It is unclear how many facilities Danone operates worldwide, and whether these six plants represent a significant volume of production. We could only identify information about two of these plants, in Ireland and Brazil. In both cases, the claims are based on a combination of standalone RECs, and the procurement of carbon credits to offset the remaining emissions (Danone, 2020b, 2021). Standalone RECs – essentially offsetting certificates for electricity – are the lowest quality means for procuring renewable electricity and are unlikely to have any meaningful impact to reduce GHG emissions (see section 3.2). For offsetting the rest of its emissions, Danone reports that it procures carbon credits from forest conservation projects in Brazil (Danone, 2021), but we could identify no details on the type of credits it procures in Ireland. While forest conservation will require more financial support to reach the scale required globally to limit the most damaging effects of climate change, such carbon storage does not offer the permanence to be considered equivalent to the reduction of emissions (see Methodology section 4.1.3).	Very poor integrity
Mars *claims that some of its brands and products – including Mars Bar – are carbon neutral in some geographies.*	Mars's brand carbon neutrality claims cover only a small selection of its flagship brand products, and only in a selection of geographies. Mars Bar – for example – claims to be carbon neutral in the UK, Ireland and Canada (Mars, 2023b). We could not identify a list of other Mars products that claim carbon neutrality. The carbon neutral claim is based on the procurement of carbon credits and covers the full value chain emissions of the product, including scope 1, 2 and 3 emissions from raw material extraction to disposal, meaning that the degree of compensation may be more commensurate than in the cases where companies make similar claims after offsetting only a portion of emissions. However, there are significant issues that affect the transparency of these claims. Firstly, although Mars specifies that emission reductions are a key component of the mitigation hierarchy before carbon credit procurement, the company does not specify to what extent emission reductions need to be achieved before a product is eligible to procure carbon credits and make this claim; it appears as if there is no minimum requirement for emission reductions and that carbon credit procurement can be the primary means for brands to claim carbon neutrality. Secondly, we could not identify information on the projects from which Mars has procured carbon credits. Without this information, the carbon neutrality claims are unsubstantiated and their integrity is unclear.	? Unclear integrity
Volkswagen *claims the carbon neutral delivery of electric cars and carbon-neutral production sites in Europe.*	The Volkswagen Group claims "carbon neutral delivery" for electric vehicles by several of its European brands (Volkswagen, 2023b, 2024). Such claims might lead customers to believe that Volkswagen successfully managed to fully decarbonise electric vehicles' value chain, including supply chains and their production. However, the company does not specify the share of emissions it has reduced along vehicle's value chain, for example by using low-carbon steel for its vehicles manufacturing. The company further claims that eight production sites operate on a "carbon-neutral basis". In contrast, Volkswagen's German and Czech production sites rely on Volkswagen's own electricity generation that remains highly depended on fossil fuels. The Group's subsidiary VW Kraftwerk GmbH, which is responsible for the electricity and heat supply for German and Czech production plants, reports a share of around 37% of coal and fossil gas in its 2022 electricity mix (VW Kraftwerk, 2023). To offset these emissions for its carbon neutral delivery claim, Volkswagen purchased carbon credits of a total volume of 5.9 $MtCO_2e$ in 2022 and 8.5 $MtCO_2e$ in 2023 (Volkswagen, 2023b, 2024). These credits mainly stem from non-permanent carbon dioxide removals, for example the Kariba mega-project in Zimbabwe of which the company purchased carbon credits of around 1.1 $MtCO_2e$ in 2022 (Volkswagen, 2023a). The Swiss project developer South Pole, who ran the Kariba mega-project, decided to terminate and withdraw from the project entirely in October 2023 following allegations of inflated climate benefits and issues related to due diligence (Elgin and White, 2023). Volkswagen also plans to develop own projects generating carbon credits through a joint venture with ClimatePartner formed in 2022, but has yet to provide any further information on its future activities and the type of projects (Volkswagen, 2024; Volkswagen ClimatePartner, 2024).	Very poor integrity

In 2023, there was a notable trend among business consultancies and carbon credit sellers transitioning away from carbon neutrality labels. The business consultancy *myclimate*, an internationally recognised provider of carbon credits and carbon neutrality labels, announced in December 2022 that it will discontinue its climate neutrality label and transition to a new impact label aligning with the climate contribution model. This announcement explicitly recognises that the current market cannot deliver carbon credits that can credibly facilitate climate neutral claims in the era of the Paris Agreement (myclimate, 2022). Following suit, in April 2023, another business consultancy *ClimatePartner* introduced a "ClimatePartner certified" label while discontinuing their carbon neutral label (ClimatePartner, 2023). Similarly, in June 2023, *SouthPole* announced its transition from their carbon neutrality labels to an alternative "Funding Climate Action" label, noting the increased scrutiny on carbon neutrality claims and the need for claims that can be made with confidence and transparency (SouthPole, 2023).

In the EU, legislators are ruling against carbon neutrality claims, although similar developments have yet to materialise in other regions. In 2024, the EU adopted a ban on climate-neutral advertising on products and services (European Parliament, 2024). This breakthrough legislation marks the first time globally where policymakers have banned carbon neutrality claims, potentially setting a precedent for regulatory developments in other countries.

Operationalising the climate contribution approach

A *climate contribution* refers to finance provided by a company to support climate change action beyond the company's own value chain, without claiming to neutralise its own emissions. A company can claim to *contribute* to climate change mitigation activities when it does so without claiming ownership of the emission reduction outcomes and without subtracting associated reductions from their own GHG inventory or net-zero target. In contrast to offsetting claims, which are more prone to greenwashing accusations, the climate contributions approach preserves transparency and helps address some of the most challenging "double counting" issues associated with the accounting of emission reductions by both "buyer" companies and "seller" countries (Fearnehough *et al.*, 2023).

At least 4 of 20 companies report providing financial support for climate change mitigation projects without making associated offsetting claims. Danone, Stellantis, Volkswagen, and Walmart report their support for mitigation projects beyond their value chains without making neutralisation claims, although the scale of these projects appears too small to align with SBTi's new beyond value chain mitigation (BVCM) recommendations, and none of these companies report their methods for determining the volume of their contributions. Despite positive developments during 2023 to operationalise the climate contribution approach, the model has not yet reached the degree of maturity to be implemented at scale. Nevertheless, some major companies, such as Klarna and Spotify, have started to transition towards this approach.

The *2023 Corporate Climate Responsibility Monitor* explored a number of potential reasons for the slow uptake of this approach (Day, Mooldijk, Hans, *et al.*, 2023, p. 67) We perceived that there was insufficient pressure from consumers, investors, or governments to enhance the environmental integrity of neutralisation claims and regulate offsetting claims, as well as companies' lack of knowledge and awareness that may hinder the adoption of the climate contribution approach. However, 2023 saw significant developments addressing these barriers.

The publication of guidelines in 2023 and 2024 constitute concrete steps towards operationalising and mainstreaming climate contributions, but there remains a lack of specificity on the claims that companies can and cannot make based on the contributions they provide. Several developments in 2023 have contributed to moving the climate contribution model from a theoretical concept towards an implementation-ready model. However, undefined details that require further elaboration will determine the extent to which these developments represent a significant step forward or merely a repackaging of old approaches.

- The **Gold Standard** published a "Step by step guidance for organisations taking responsibility for their unabated emissions" (Gold Standard, 2024) which follows all best practice recommendations on BVCM and also provides prescriptive guidelines on claims.

- **SBTi recommendations for beyond value chain mitigation (BVCM)**
  In February 2024, SBTi published the outcome of its consultation process on recommendations for companies to engage in BVCM (Benson *et al.*, 2024). The outcome is an operationalisation of the climate contribution approach; companies are recommended to provide finance – based on a carbon price applied to the volume of their own emission footprint – to climate change mitigation efforts outside of the companies' value chain. Our methodology for assessing the integrity of climate contributions is aligned with SBTi's main recommendations for BVCM, including the use of a money-for-tonne model for determining financial contributions through a science-aligned carbon price across all scope 1, 2 and 3 emissions (Benson *et al.*, 2024). However, the SBTi report does not rule out the possibility of companies making compensation claims under the BVCM approach, which is a highly relevant omission. If a decision is made to depart from the core principles of SBTi to allow offsetting toward target fulfilment *(see section 1.2)*, then the BVCM recommendations could have a substantially different meaning compared to the current situation.

- **VCMI Claims Code of Practice**
  The Voluntary Carbon Markets Integrity initiative (VCMI) has released its integrity guidelines for corporate use of carbon credits. In some regards, the concept of VCMI's Silver, Gold, and Platinum "carbon integrity" claims outlines a transparent and constructive approach. Under these claims, companies that have already achieved their climate targets can additionally procure carbon credits to take responsibility for their unabated emissions. These claims constitute a form of climate contribution approach. However, such contributions would be delivered exclusively through a tonne-for-tonne model with carbon crediting projects, which may make the claims more prone to potentially misleading communications regarding the extent to which emissions are considered to be neutralised. This concern is heightened by the fact that the precise terms of the claim remain somewhat ambiguous, although companies are *recommended* not to claim the neutralisation of their emissions through this means (VCMI, 2023a). Despite this potentially positive development, it remains to be seen whether the VCMI *carbon integrity* claims will be picked up by companies, compared to VCMI's separate claims framework, the beta scope 3 flexibility claim. In contrast to the contribution model set out in the carbon integrity claims, VCMIs beta Scope 3 Flexibility Claim would revive the traditional offsetting narrative, allowing companies to offset emissions towards their scope 3 targets, posing a major risk to corporate ambition (*see section 1.2*).

What may happen in 2024?

Details on claim terminology and finance recipients need to be clarified. Although the SBTi BVCM recommendations and VCMI carbon integrity claims represent frameworks that could be used for mainstreaming the climate contribution approach, key details for implementation remain unaddressed. Most importantly, the potential links between these frameworks and any emerging flexibility mechanisms need to be clarified: the claims that companies can make with the contributions that they provide should be specified in clear terms to avoid a new generation of inconsistent and potentially misleading communications. More guidance is needed regarding where and how climate contributions could be channelled. With these details, business consultancies and project developers will be able to follow a clear framework, and more companies will be able to start using this model.

Identifying and supporting high-hanging fruit projects is crucial. The high hanging fruit of mitigation potential refers to the technologies and measures to decarbonise emission sources that remain otherwise entirely inaccessible to host country governments in the near- and medium-term future, on account of extraordinary costs or other insurmountable barriers that cannot reasonably be overcome (Day, Mooldijk, Posada, *et al.*, 2023). The increasing clarity on how to pursue climate contributions should lead to a significant increase in flows of voluntary climate finance from companies. However, there remains a major concern about the quality and diversity of projects that can attract voluntary climate finance. The pathways to the operationalisation of climate contributions through the SBTi BVCM report and the VCMI Claims Code of Practice are quite focused on the continued use of carbon crediting projects under a contribution narrative. It may be possible but is likely very challenging for companies to aim for the high-hanging fruit of climate change mitigation projects, which are in great need of support to unlock and scale up technologies and practices for deeper decarbonisation of the most challenging emission sources. There remains a gap for an initiative to identify high-hanging fruit projects, for companies who wish to demonstrate their superior ambition.

4.2 Revision of the GHG Protocol

One of the major developments of 2023 for the architecture of corporate climate accountability frameworks is the initiation of the revision process for the GHG Protocol Corporate Standard and the GHG Protocol Guidelines for Scope 2 and Scope 3 accounting. This extensive process is expected to result in the publication of revised standards and guidelines in 2026.

The standards and guidelines of the GHG Protocol are highly influential for the transparency and integrity of corporate climate action. They form a foundation for most of the other voluntary initiatives and governmental legislations that make up the landscape of the global corporate climate accountability framework, including major initiatives such as the Science Based Targets initiative. The revised GHG Protocol standards and guidelines will determine whether companies have tangible incentives or requirements to implement high-quality strategies and affect the extent to which companies can identify and exploit potential accounting loopholes to exaggerate their plans and progress.

Given that aspects of the GHG Protocol standards and guidelines underpin many of the key issues assessed in this report, our analysis of various topics in sections 1, 2 and 3 each includes recommendations for the GHG Protocol revision process. These recommendations are compiled and summarised in this section. Further details on each recommendation can be found in the respective sections.

Resisting pressure to integrate offsetting into inventories

- **The categorisation and accounting of value chain emissions should be reconsidered to help companies, standard setters and other stakeholders to focus on the most critical decarbonisation indicators** for each sector, which are well within companies' direct control. Flexibility through offsetting is not the right solution to address the challenges that companies understandably face in implementing scope 3 targets *(see section 1.2)*.
- **Scope 2 and 3 guidance should not introduce 'project-based accounting'** as an alternative to claim emissions reductions *(see section 3.2)*. A proposal for the revision of the scope 2 guidance to introduce a new accounting method – labelled 'project-based accounting' – would allow companies to claim reductions in their scope 2 emissions based on emissions avoided from renewable energy projects implemented anywhere in the world, whether inside or outside of the local grid region or market. Allowing for 'project-based accounting' either in scope 2 or scope 3 would essentially be the same in practice to offsetting with carbon credits, and ignores the responsibility that companies have to contribute to efforts to decarbonise the electricity grids that they use and the other emission sources that their businesses are built on. It is a highly contentious proposal for improving the GHG-P Guidance, given the increasing awareness of the various fundamental limitations of offsetting and the general shift we perceive away from this practice *(see section 4.1)*.
- **Scope 3 guidance should only allow the introduction of 'market-based methods' for upstream scope 3 emissions if measures are taken to ensure high transparency and integrity of renewable electricity procurement** *(see improving market-based accounting methods below)*. If done with high transparency and integrity, this could incentivise companies to better develop their supply chain emission reduction strategies and engage with suppliers to help them reduce their energy-related emissions.

Improving market-based accounting methods

These recommendations serve to improve transparency on key issues surrounding electricity procurement, enabling the identification of companies pursuing best practice approaches and encouraging the others to follow suit *(see section 3.2)*.

- **Scope 2 guidance should increase granularity on reporting for procurement of renewable electricity** to distinguish between procurement methods such as standalone RECs, PPAs, and others, recognising the stark differences in the impact of these procurement constructs regarding the additionality of the renewable electricity that the companies claim.
- **Scope 2 guidance should also impose stronger requirements on the additionality** of renewable electricity procurement constructs, such as restrictions on the use of standalone RECs.
- **Scope 2 guidance should require companies to disclose information on the matching approach** used when procuring renewable electricity and encourage a move towards hourly matching. This is crucial because hourly matching would stimulate demand for additional and novel renewable energy generation and storage technologies, while annual matching hides a significantly embedded reliance on fossil fuel generation.

Recognising that bioenergy is not an equal alternative to non-combustible renewables

- **The GHG protocol should include specific information on how to account for bioenergy emissions in all emission scopes.** Within this guidance, it should be clear that bioenergy is not an equal alternative to modern renewables *(see Section 3.3)*. Bioenergy is not an emissions-free energy source and is highly likely to have negative sustainability implications. These include, but are not limited to, deforestation, biodiversity loss, and food insecurity. Even when companies source bioenergy from 'sustainable' sources, there is the inherent problem that by using any type of bioenergy at all – which is and will remain a scarce resource – they push other companies to use non-sustainable biomass. To limit global warming to 1.5°C and protect ecosystems, it is key to reduce overall demand for biomass. Companies operating in sectors with viable alternatives for decarbonisation should pursue those avenues. *(see section 3.5)*

Clearer guidance on relevant boundaries for 'direct' and 'indirect' use-phase emissions from sold products

- **Scope 3 guidance should require companies to report both 'direct' and 'indirect' use-phase emissions from their sold products separately.** This could be done by creating an additional category for 'indirect' use-phase emissions. Direct use-phase emissions stem from products that directly consume energy when used, such as machinery or vehicles. Indirect use-phase emissions originate from products that indirectly consume energy when used, such as clothing that requires washing. It is important to separate these two categories as the level of control that a company has over indirect use-phase emissions is usually significantly lower than that over direct use-phase emissions. Additionally, integrating indirect use-phase emissions into company targets can sometimes be misleading as those emissions are largely outside the company's control. Indirect use-phase emissions can be reduced through independent processes such as efficiency improvements in equipment and grid decarbonisation, without direct intervention of the company setting the target.

- **The extent to which 'direct' and 'indirect' use-phase emissions from sold products should be considered a mandatory part of the GHG Protocol Corporate Standard should depend on the specific circumstances of the sector and the relevance of these emissions for companies' overall targets and strategies.** These categories are currently put together with the latter marked as optional for reporting. This is a significant gap in the existing standard as use-phase emissions can be very significant relative to the company's total value chain emissions. In some cases, such as for electricity retailers, the absence of a requirement to report emissions related to sales of products that are not directly sold to end-users creates an accounting loophole. Electricity retailers that purchase lower-cost wholesale electricity comprising a mix of renewable and non-renewable sources could claim zero downstream emissions if they claim to have passed the renewable portion of that electricity onto customers while reselling the remaining electricity to other sales partners. This could diminish incentives for electricity retailers to pursue high-quality renewable electricity procurement

- **Scope 3 guidance should also be further specified to include information on reporting boundaries for certain products.** Especially when companies' products are positioned 'upstream' in the value chain, such as raw materials or inputs like steel, which go through numerous subsequent processes before reaching an end consumer. In these cases, it is crucial to clarify not only which types of 'use-phase' emissions that need to be reported but also up to which point companies need to track and report emissions. Without that clarity, companies operating upstream in the value chain could experience significant uncertainty regarding their emissions. For example, Thyssen-Krupp, a steel and machinery manufacturer, reported 614 $MtCO_2e$ of downstream scope 3 emissions in 2020, but only 1.8 $MtCO_2e$ for the same category in 2021 (Thyssenkrupp, 2022; Day, Mooldijk, Hans, *et al.*, 2023), although both methods would be consistent with GHG Protocol guidelines. Such an improvement would help companies better understand which emissions they need to take responsibility for and set targets and measures accordingly.

4.3 Evolving from voluntary initiatives to formal accountability

Some extracts of this section are adapted from The Corporate Accountability Loop (Hans et al., 2023).

Summary

The integrity of the current corporate accountability system is impaired by inherent tensions deriving from a lack of institutional separation and direct corporate influence. Multiple functions of the corporate accountability system are currently performed by a small group of overlapping initiatives without sufficient institutional separation and independence. This setup allows companies to directly influence activities under specific accountability functions, despite them being the entities to be held accountable. Urgent adjustments are needed to establish institutional separation and independence among actors performing the functions of *standard setting*, *validations*, and *mobilisation*. A mature and functional system eventually requires a shift from voluntary initiatives to regulation, accredited verification and validation entities, and effective advocacy and litigation.

The findings of our analysis show that – while voluntary initiatives play a key role in the corporate climate accountability system – the current over-reliance on voluntary initiatives for many functions of the system does not result in sufficiently credible corporate climate action, despite the increasing urgency of the climate crisis. These pioneering initiatives were formed at a time when corporate climate action was in its early stages. As we have now reached a stage where most of the largest and most influential multinational corporates regularly announce targets and strategies to reduce emissions, the model of voluntary mobilisation may have outgrown its original purpose.

Recognising the need for enhanced integrity within the current system, the UNFCCC Secretariat released its Recognition and Accountability Framework (RAF) in 2023 and is engaged in consultations regarding its implementation plan (UNFCCC, 2023c).

Status quo: The integrity of the current corporate accountability system is impaired by inherent tensions deriving from a lack of institutional separation and direct corporate influence.

Hans *et al.* (2023) outlined the key conceptual functions of the corporate climate accountability system in the Corporate Accountability Loop (Figure 6). In assessing the status quo of this system and the capacity of these key functions to operate effectively, the authors identified key issues in the current framework that create inherent tensions:

⚠ **A small group of overlapping initiatives perform multiple functions within the current corporate accountability system without sufficient institutional separation and independence.**

Single initiatives or actors perform multiple functions simultaneously, including (1) developing standards (2) mobilising companies, and (3) validating companies' strategies. For example, several partner initiatives to the UNFCCC's Race to Zero campaign, such as the Science Based Targets initiative (SBTi) or the SME Climate Hub, perform these multiple functions, often resulting from their role as pioneering entities in mobilising and enabling companies to set climate strategies.

These initiatives were established at a time when corporate climate action was in its infancy, and the combination of these functions may have been considered most effective at the time. However, the global business community has now reached a stage where it has become standard practice for most of the largest and most influential multinational corporates to announce targets and strategies to reduce emissions. In this evolved context, voluntary initiatives and even their philanthropic supporters might face an inherent tension stemming from the multifaceted nature of their roles. On the one hand, for example, the development of a standard for 1.5°C-compatible corporate transition plans should be based on the requirements indicated by the latest scientific literature, even if this might imply very challenging benchmarks. On the other hand, if the initiative developing such a standard is also performing the function of mobilising as many companies as possible to participate, then it may be necessary to identify compromises that could undermine each of those important functions.

⚠ **Companies often hold significant influence over activities under specific accountability functions, despite them being the entities to be held accountable for.**

In the current system, companies play an integral role in consensus-aligned development processes for voluntary standards and decarbonisation benchmarks. Such processes aim to reconcile scientific findings with corporate interests, with companies dedicating substantial personnel and financial resources to participate and influence these processes. Companies' climate strategies subsequently are directly assessed against these standards, guidance, or decarbonisation benchmarks that they helped to develop in the first place. This creates a conflict of interests for companies as they directly influence activities conducted by voluntary initiatives and actors under the core accountability functions of the current system.

Prompt adjustments to the existing system: Establish institutional separation and independence between actors performing the functions of *standard setting*, *validations*, and *mobilisation*.

The existing shortcomings of the current corporate accountability system call for immediate improvements to facilitate a move towards higher integrity and to better identify genuine corporate leadership.

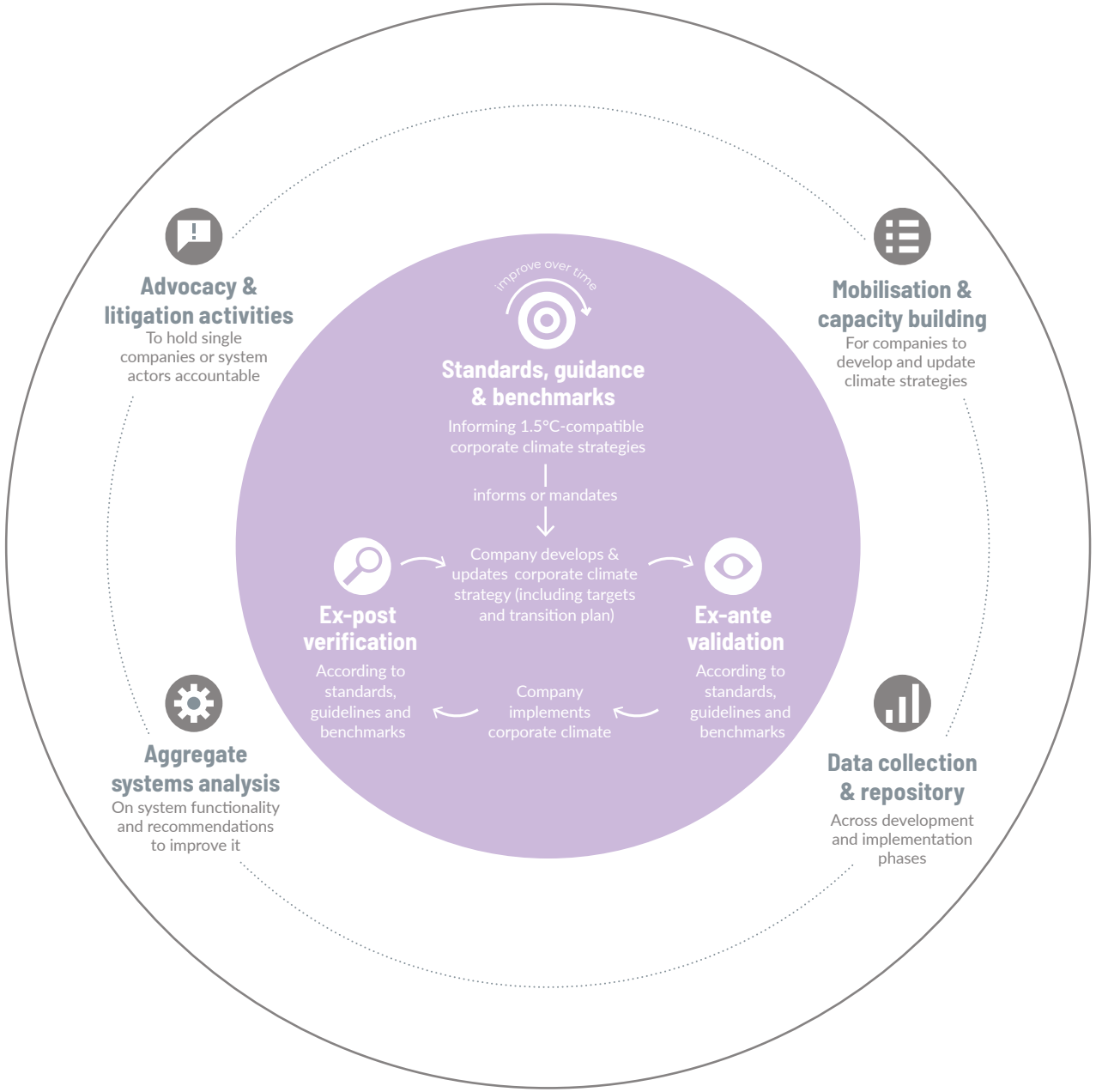
- **Institutional separation for key functions of the accountability system** mitigates some of the most fundamental tensions that impair the integrity of the current system. Mobilisation and capacity-building initiatives should aim to engage as many companies as possible, while those setting science-aligned standards should not compromise between companies' interests and scientific findings.
- **Compliance, grievance, and whistle-blowing mechanisms must be introduced within existing initiatives** to accompany this institutional separation. Such mechanisms enable researchers, civil society, and other actors to scrutinise corporate climate strategies and accountability process to flag potential issues. These issues may include companies' non-compliance with standards or validators' failure to follow procedures for validation and verification. Such mechanisms would also depend on independent oversight bodies that can ensure the removal of companies' validations in case of non-compliance.

Evolution to formal accountability: Shift from voluntary initiatives to regulation, accredited verification and validation entities, and effective advocacy and litigation.

The United Nation's High-Level Expert Group (HLEG) 'Integrity Matters' report on net-zero pledges emphasised the need to develop "regulation and standards in areas including net zero pledges, transition plans and disclosure" as one of their ten recommendations (UN HLEG, 2022). The corporate climate accountability system is already being reshaped by emerging climate regulations around the world. This shift is crucial for determining how target validations and performance verifications will be executed, and whether the system enables effective advocacy and litigation activities:

- **The legally binding nature of regulation contributes to an enforceable accountability system** in which it is no longer voluntary for companies to commit to corporate climate strategies and in which companies and validators can be held accountable for misleading targets and claims that undermine the integrity of corporate climate action. Recently, several governments have introduced, or are introducing, regulation on issues such as corporate emission disclosures or corporate transition plans (Hale *et al.*, 2022; Oxford Net Zero, 2023). In the EU, for example, regulations across multiple EU directives could lead to legally binding requirements for corporate climate disclosure and corporate transition plans in line with EU-specific 1.5°C decarbonisation benchmarks (Pugliese and Godinot, 2022). Comprehensive regulation introduced in one jurisdiction can directly influence other jurisdictions due to the global nature of corporate value chains.
- **The introduction of regulation or international standards will enable target validations and performance verifications by accredited and legally liable entities.** Like traditional financial auditing by accounting firms, entities performing validations and verifications could undergo accreditations by regulators and can be held legally liable in case of negligence.
- **The formalisation of the accountability system can enhance the effectiveness of the advocacy and litigation activities.** In recent years, numerous plaintiffs such as NGOs, citizens, and environmental law firms across different jurisdictions have engaged in litigation activities against inadequate corporate climate action (Setzer and Higham, 2022, 2023; UNEP, 2023). The emergence of legislation might introduce more specific legal liabilities for companies, as well as voluntary initiatives and actors involved in the validation and verification of 1.5°C-compatible climate strategies. Such legal liability does not exist in the current system, which prevents advocacy and litigation from effectively holding companies accountable through legal means.
- **This necessary shift includes an important role for voluntary initiatives.** The shift to legally binding regulation is necessary to achieve a functional accountability system but it might be prone to several potential issues. Regulations might be fragmented across different countries or regions worldwide, may not aligned with the latest science due to political considerations and the influence of vested interests, and could reinforce global inequalities through transboundary effects. In this context, voluntary initiatives and actors can play an important future role in scrutinising forthcoming regulations and continuing to advance the understanding of good practice according to the latest science, equity, and climate justice considerations. Such activities can promote upward convergence to common and high-ambition standards by consolidating good practice approaches and support their transition into legally binding measures (Hale, 2021).

Figure 6: Key conceptual functions of an effective corporate climate accountability system (Hans *et al.*, 2023)



Core functions

Necessity to perform functions in an **independent, enforceable and mandatory** manner to ensure high integrity corporate climate action.

Supportive functions

Cross-cutting functions essential to support and control on proper functionality of core functions.

4.4 Summary of recommendations for the evolution of the corporate climate accountability system

Recommendations for strengthening the corporate climate accountability system

Evolution from carbon neutrality claims to beyond value chain mitigation (BVCM) contributions

- **Regulators** worldwide should replicate the EU's landmark legislation banning the use of carbon neutrality claims for products and services, recognising the fundamental limitations of such claims.
- **SBTi** and **VCMI** should further align their recommendations for climate contributions. These recommendations should provide more specificity on how exactly companies could channel finance and should specify that such contributions cannot lead to neutralisation claims: BVCM should not be used as an umbrella term to legitimate the further use of carbon credits and/or climate neutrality claims *(see section 1.2)*.

GHG Protocol revision process

To strengthen integrity, the GHG Protocol revision process should:

- Improve market-based accounting methods by increasing reporting granularity, additionality requirements and hourly matching for renewable electricity procurement.
- Resist pressure to integrate offsetting into inventories through so-called 'project-based accounting'.
- Recognise that bioenergy is not an equal alternative to non-combustible renewables and include guidance on how to account for bioenergy emissions in all emission scopes.
- Clarify guidance on relevant sector-specific reporting boundaries for 'direct' and 'indirect' use-phase emissions from sold products, recognising the specific circumstances of each sector.

Current and future voluntary standard setters (e.g. SBTi, GHG Protocol and CDP):

- Standard setters should ensure to follow science-aligned approaches to the development of standards, guidance, and decarbonisation benchmarks. Such processes would need to be proactively safeguarded against excessive direct influence or compromise with corporate interests.
- Standard setters should introduce compliance, grievance, and whistleblowing mechanisms in voluntary initiatives to enable effective public scrutiny.

Regulators at the national and international level

- Regulators should initiate a shift from voluntary accountability initiatives and towards formal regulation that includes accredited verification and validation entities, and enables effective advocacy and litigation.
- Regulators should establish institutional separation and **independence** between actors performing the functions of *standard setting*, *validations* and *mobilisation*.

SECTION B
COMPANY ANALYSES

This section of the *2024 Corporate Climate Responsibility Monitor* includes an in-depth assessment of the integrity of the climate change mitigation strategies from 20 of the world's largest companies.

We assess five of the largest global companies – excluding majority state-owned companies – from four key sectors: agrifood producers and retailers, automobile manufacturing, electric utilities, and fashion.

- For electric utilities and fashion, we select the top five global companies from each of these sectors according to their annual revenue in 2022 (Forbes, 2023). For electric utilities, this includes **Duke Energy, Enel, ENGIE, Iberdrola** and **Korea Electric Power Corporation (KEPCO)**. For fashion, this includes **Adidas, Fast Retailing, H&M Group, Inditex** and **Nike**.
- For automobile manufacturers, we select the top five global companies by revenue including also at least 2 companies that are specialised in producing heavy duty trucks only. This is to gain insights on the integrity of climate plans for heavy duty vehicle manufacturing, since previous iterations of the *Corporate Climate Responsibility Monitor* have focused only on light duty vehicle manufacturing. The selection includes **Daimler Truck**, **Stellantis**, **Toyota, Volkswagen Group** and **Volvo Group**.
- For the agrifood sector, we select the four largest companies with targets formulated under SBTi's new FLAG guidance: **Nestlé**, **Tesco**, **Mars**, **Danone**. This specific sample selection is to test the hypothesis that the new FLAG guidance can improve the integrity of agrifood companies' targets. In addition to these four companies, we also select **Walmart** for assessment due to its high relevance as by far the largest company in the sector, and as the largest company in the world across all sectors.
- Our selection for all sectors excludes majority state-owned companies due to our perception that fundamental differences in management structures and decision-making structures for climate change strategy may significantly detract from the comparability of these companies' plans, and the insights that we can draw from the company sample.

Most – but not all – of the companies assessed have committed to high-profile climate change mitigation pledges under the Science Based Targets initiative. The key objective of the analysis is to identify replicable good practice while assessing the integrity of the most influential global corporate actors that are putting themselves forwards as climate leaders and role models for other companies. Scrutiny of their plans is also necessary to identify whether these influential leaders really are setting the right examples, and whether the guidance and frameworks upon which they are making their plans are sufficient. However – aside from in the agrifood sector – this was not a selection criterion for this iteration of the Corporate Climate Responsibility Monitor; we have assessed the largest companies by revenue, according to the considerations listed above, and it is a coincidence that most of these companies are also members of major initiatives such as SBTi.

An overview of the selected companies and our evaluations is presented in Table 16. The 20 companies covered by this monitor account for approximately USD 2.3 trillion of revenue in 2022 (Forbes, 2023). Their total self-reported GHG emission footprints in 2019, including scope 3 emissions, amount to approximately 3.9 $GtCO_2e$. This is equivalent to roughly 7% of global GHG emissions.[5] Eight of the 20 companies selected through the process described above were also assessed in the 2022 or 2023 Corporate Climate Responsibility Monitor.

5 *Some overlap in emission statistics is likely in the cases that one company's scope 3 emissions are included in the scope 1 or 2 emissions of another company. We anticipate that any overlap is marginal and of limited significance to the key insights derived from this report. The companies' combined emission footprint may also be higher, due to some companies' incomplete emission disclosure.*

Table 16: Overview of companies assessed in the Corporate Climate Responsibility Monitor 2024 (companies are listed alphabetically within each integrity rating category)

HIGH INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
No companies achieved a high integrity rating				

REASONABLE INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
Enel	Zero emissions in 2040			p. 92
Iberdrola	Net zero emissions before 2040			p. 96

MODERATE INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
Danone	Net zero emissions by 2050			p. 118
H&M Group	Net zero emissions by 2040			p. 108
Inditex	Net zero emissions by 2040			p. 110
Mars	Net zero emissions by 2050			p. 120
Nike	Net zero emissions by 2050			p. 112
Stellantis	Carbon net-zero by 2038			p. 76
Volvo Group	Net zero emissions by 2040			p. 84

LOW INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
Adidas	Carbon neutral by 2050			p. 104
Daimler Truck	CO_2-neutrality by 2050			p. 74
ENGIE	Net zero carbon by 2045			p. 94
Duke Energy	Net zero carbon by 2050			p. 90
Fast Retailing	Carbon neutral by 2050			p. 106
Nestlé	Net zero emissions by 2050			p. 122
Tesco	Net zero emissions by 2050			p. 124
Volkswagen Group	Carbon neutral by 2050			p. 81
Walmart	Zero emissions in operations by 2040			p. 126

VERY LOW INTEGRITY	HEADLINE PLEDGE	TRANSPARENCY	INTEGRITY	PAGE
KEPCO	Carbon neutrality by 2050			p. 98
Toyota	Carbon neutral by 2050			p. 78

5-point scale High Reasonable Moderate Poor Very low . **See individual company analyses.**
Assessments were made based on public information identified by the authors. A poor rating may not necessarily be an indication that a company's climate strategy is weak, but could also indicate that the information was insufficient to confirm good practice. Ambitious companies can improve their ratings by ensuring that all aspects of their climate responsibility strategies are transparently and accurately disclosed, and in the public domain.

Our company-specific assessments include a rating of the **transparency** and **integrity** of their approaches across four key elements of corporate climate responsibility as presented in the methodological overview (*Good Practice Overview*, p13): **1 - Tracking and disclosure of emissions**; **2 – Setting specific and substantiated targets**; **3 – reducing emissions**; and **4 – Responsibility for unabated and residual emissions**:

Our assessments include a rating of the transparency and integrity of companies' approaches. **Transparency** refers to the extent to which a company publicly discloses the information necessary to fully understand the integrity of its approaches towards the various elements of corporate climate responsibility. **Integrity**, in this context, measures the quality, credibility and comprehensiveness of those approaches.

Full details on our methodology for assessing good practice across these four areas can be found in the accompanying methodological document: *Guidance and assessment criteria for good practice corporate emission reduction and net-zero targets: Version 4.0* (NewClimate Institute, 2024).

The *Corporate Climate Responsibility Monitor* promotes transparency with the philosophy that consumers, regulators, shareholders, and other observers should be able to follow and assess the integrity of companies' claims. Accordingly, the company assessments in this section are based only on publicly available information that could be identified by the authors. Each rating represents the authors' understanding of the publicly available information. In some cases, company information was scattered across different sources (e.g. annual reports, press releases and statements, webpages, and other marketing materials); it is possible in this process that information may have been misinterpreted, or overlooked. Companies should consider how to present information as transparently as possible, to ensure that observers are able to readily identify all the relevant information necessary to understand their climate strategies.

5 Automotive manufacturers

5.1 Sector highlights

- **Automotive manufacturers' emissions mostly originate in the use phase of its sold cars, vans, trucks, and buses and from sourced products such as steel or batteries.** The accelerated phase-in of electric vehicles and the procurement of low-carbon products provide key levers for manufacturers to address these emissions along their value chain.
- **Emission disclosures by automotive manufacturers remain inadequate and incomplete.** Light-duty vehicle manufacturers generally underreport the use-phase emissions of sold cars (Volkswagen, Toyota) while heavy-duty vehicle manufacturers show a mixed picture, with some disclosing use-phase emissions (Volvo Group) and others not at all (Daimler Truck). Integrated companies producing both light- and heavy-duty vehicles do not include the latter's use-phase emissions in their group level reporting (Volkswagen, Toyota).
- **The integrity of emission reduction targets differs substantially between light- and heavy-duty manufacturers.** Light-duty vehicle manufacturers continue to set inadequate 2030 targets without 1.5°C-aligned phase-out targets for internal combustion engines (Volkswagen, Toyota). Only Stellantis stands out with its 2030 ICE phase-out target for the European market. Heavy-duty vehicle manufactures apply different but generally ambitious target-setting approaches. Some companies set specific short-term targets towards 2030 (brands under Volkswagen Group, Volvo Group) while others set specific 1.5°C-aligned phase-out dates in the longer term towards 2050 (Daimler Truck) alongside supporting the charging infrastructure roll-out.
- **Emissions from the sourcing of upstream material like steel remain poorly addressed across the entire manufacturer's sample.** Only Volvo Group lays out more comprehensive and transparent plans by targeting at least 10% low-carbon steel and aluminium procurement by 2030 supported by signed purchase agreements and collaborations with low-carbon steel producers.
- **Automotive manufacturers generally fail to clarify the extent to which their net-zero and carbon neutrality targets beyond 2030 will be achieved through offsetting.** Companies neither disclose the envisioned amount nor type of carbon credits to offset or neutralise emission in the future (Daimler Truck, Toyota, Volkswagen, Volvo Group). Some companies communicate climate contributions beyond their value chain although these remain very modest compared to today's emissions (Stellantis, Volkswagen).

Table 17 provides a summary overview of our transparency and integrity ratings for Daimler Truck, Stellantis, Toyota, Volkswagen Group, and Volvo Group.

Table 17: Overview of integrity ratings for automobile manufacturing companies

COMPANY	HEADLINE PLEDGE	INTEGRITY	*Tracking & disclosure of emissions*	*Target setting*	*Emission reduction measures*	*Climate contributions & offsetting*	PAGE
Stellantis	Carbon net-zero by 2038	◐	◐	◐	◐	◔	p. 76
Volvo Group	Net zero emissions by 2040	◐	◐	◐	◕	◌	p. 84
Daimler Truck	CO_2-neutrality on the roads and throughout the entire value chain globally by 2050	◔	◔	◐	◔	◌	p. 74
Volkswagen Group	Carbon neutral by 2050	◔	◔	◌	◐	◌	p. 81
Toyota	Carbon neutral by 2050	◌	◔	◌	◌	◌	p. 78

5.2 Sectoral transition framework

The IPCC's Sixth Assessment Report emphasises the need for a rapid and transformative change of the global transport sector to stay below the Paris Agreement's 1.5°C temperature limit. Global transport-related CO_2 emissions including global aviation and maritime shipping must fall by around 59% by 2050 relative to modelled 2020 emissions to limit warming to 1.5°C (IPCC, 2022, p. 32; Pathak *et al.*, 2022, p. 98). These global reductions are subject to regionally differentiated trends.

Global emissions from cars and vans (light duty vehicles) must significantly decline by 2030 across all geographies given readily available zero-emission technologies and reach zero emissions globally by 2050 at the latest. For advanced economies, the International Energy Agency (IEA) estimates that annual use-phase CO_2 emissions from light-duty vehicles need to be reduced by around 45% by 2030, over 90% by 2040 and finally reach zero emissions by 2050 to be compatible with the 1.5°C temperature limit (IEA, 2023c, p. 93), all compared to a 2022 baseline. In emerging markets and developing economies, the IEA states that CO_2 emissions from cars and vans can be reduced at a slower pace towards zero emissions by 2050, namely by around 10% by 2030 and over 70% by 2040 compared to a 2022 baseline. In this context, recently published literature identifies global 1.5°C-compatible emission intensities for newly sold passenger vehicles of around 30 gCO_2 per passenger km by 2030, further going down to less than 1 gCO_2 by 2050 (Dietz *et al.*, 2023, p. 8).

Global emissions from heavy trucks and buses (heavy-duty vehicles) follow a more geographically differentiated trajectory considering less mature zero-carbon technologies available. Similarly to cars and vans, emissions from heavy-duty vehicles in advanced economies must reach zero emissions by 2050 and reduce by around 20% by 2030 and 70% by 2040 in the interim. Emissions from the use of heavy trucks and buses in emerging markets and developing economies can still increase by 5% by 2030 and then reduce by around 35% and 85% respectively by 2040 and 2050. In this context, recently published literature defines 1.5°C-compatible emission intensities from the use of heavy-duty trucks as of 30–61 gCO_2 per tonne-km by 2030 (IEA, 2023c; Teske *et al.*, 2023), further going down to 0–3 gCO_2 per tonne-km by 2050.

Automotive manufacturers' climate strategies ought to avoid *false* technological solutions with inferior efficiency, sustainability, and effectiveness. Such technologies include, among others, the use of biofuels, e-fuels, and fuel cell vehicles for light-duty transport. For example, biofuel production at scale faces the high likelihood of competing with other environmental and social interests, such as food production, biodiversity, and forest protection (Clarke *et al.*, 2022, p. 42). This is especially relevant for the automotive sector given that technological alternatives are readily available, while sustainably sourced biofuel might be needed in other sectors of the economy with fewer alternatives available like aviation. Alternative fuels such as e-fuel produced with hydrogen energy and hydrogen-based fuel cells, however, also require much greater amounts of renewable electricity production than battery electric vehicles (Transport & Environment, 2018). Such technologies therefore might only be an efficient, effective and sustainable alternative—alongside battery electric vehicles—for heavy-duty market segments (Jaramillo *et al.*, 2022, pp. 1070–1071).

Key actions and measures for automotive manufacturers

Measures addressing emissions from the use of light-duty vehicles (downstream scope 3)

Emissions from the use of sold cars and vans (scope 3 category 11) represent the largest source of emissions across automobile manufacturers' value chains.

Phase-out of internal combustion engines (ICEs) Critical transitional measure

Electric vehicles powered by decarbonised electricity have a large potential to reduce land-based transport greenhouse gas emissions on a life cycle basis (IPCC, 2022, p. 32). Several studies identify 1.5°C-aligned decarbonisation milestones for the phase out of internal combustion engines (ICEs) replaced by electric and low-emission vehicles at the global and regional level (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93).

Global

- The global sales share for zero emission vehicles must reach **67–95% by 2030** and **100% between 2035–2040** (CAT, 2020, p. 27; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93)
- These decarbonisation milestones consequently leading to a **complete phase-out of ICE sales by 2035–2040** are in line with the COP26 declaration on zero emission cars mandating **100% of total sales of passenger vehicles and vans by 2040 globally** (COP26 Presidency, 2021; SBTi , 2024f, pp.16–17.

Advanced economies

- **Advanced economies** such as China, US, the EU27 and Japan must already reach a **95–100% sales share of zero emission vehicles by 2030** and **100% latest by 2035** (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4).
- These decarbonisation milestones are fully in line with the COP26 declaration on zero emission cars mandating **100% of total sales of passenger vehicles and vans in leading markets by 2035** (COP26 Presidency, 2021; SBTi , 2024f, pp.16–17).

Support the roll-out of vehicle charging infrastructure Enabling measure

The electric vehicles uptake requires large-scale investments in electric charging infrastructure and related grid connections (Pathak *et al.*, 2022, p. 98; IEA, 2023b, pp. 123–129). Recent analysis estimates the need for around 17 million public electric vehicle charging points globally by 2030, 18 million by 2035 and 31 million by 2050 (IEA, 2023c, p. 93). Automotive manufacturers can directly and indirectly support the roll-out of vehicle charging infrastructure, for example through investments or collaborations to install and operate publicly accessible charging points.

Enabling measures to support the roll-out of vehicle charging infrastructure can underpin and substantiate an automotive manufacturer's 1.5°C-compatible business model, but still critically hinge on the phase-out of internal combustion engines (ICEs).

Support of demand management solutions Enabling measure

The systemic transformation of the passenger transport sector will require demand management solutions to reduce single vehicle usage (Pathak *et al.*, 2022, p. 98; Boehm *et al.*, 2023, pp. 76–98). Such demand-side measures can include, among others, the support of carpooling, public transportation, and mobility-as-a-service while investing in integrated urban mobility solutions. These measures generally aim to decrease individual vehicle ownership and encourage alternative mobility concepts.

Enabling measures to support demand management solutions can underpin and substantiate an automotive manufacturer's 1.5°C-compatible business model, but still critically hinge on the phase-out of internal combustion engines (ICEs).

Measures to address emissions from the use of heavy-duty vehicles (downstream scope 3)

Emissions from the use of trucks, buses, and other heavy-duty vehicles (scope 3 category 11) represent the largest source of emissions across automotive manufacturers' value chains.

Development & phase-in of zero-carbon heavy-duty vehicles Critical transitional measure

Decarbonizing long-range heavy-duty vehicles like trucks and buses can be achieved through battery-electric haulage, electric road systems, and hydrogen- or biofuel-based technologies (Pathak *et al.*, 2022, p. 98). Challenges related to driving range, costs, and infrastructure availability need to be addressed, particularly in the commercialisation of hydrogen-based fuel-cell vehicles that require an increased capacity for low-carbon hydrogen production to be an effective emissions reduction strategy. Several studies identify 1.5°C-aligned decarbonisation milestones for the phase out of internal combustion engines (ICEs) in buses and heavy trucks at the global and regional level (UNFCCC, 2021, pp. 10–11; Mission Possible Partnership, 2022, p. 40; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93).

Heavy-duty trucks

- The global sales share of battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) must reach between 30–37% by 2030 globally and 100% by 2040 in advanced economies and China (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93).
- A complete phase-out of trucks with internal combustion engines would need to be achieved between 2045–2050 globally (Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93).

Buses

- The global sales share of BEVs and FCEVs must be reach between 56–60% by 2030 globally and 100% by 2030 in advanced economies and China (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93).
- A complete phase-out of buses with internal combustion engines would need to be achieved between 2035–2050 globally (Boehm *et al.*, 2023, pp. 77–78; IEA, 2023b, pp. 88, 93).

Support the roll-out of charging infrastructure Enabling measure

The roll-out of charging infrastructure plays a crucial role for the electrification of heavy-duty vehicles like trucks and buses, given the substantial costs associated with high-power charging infrastructure (Jaramillo *et al.*, 2022, pp. 1071–1073). Investment in shared charging infrastructure at key transport hubs, such as bus and truck depots, freight distribution centres, and ports, is essential to encourage the transition to battery electric and fuel cell electric vehicles in the heavy transport sector. Recent analyses, for example, estimate the need for around 12 million hydrogen refuelling stations globally by 2030, 15 million by 2035 and 45 million by 2050 (IEA, 2023c, p. 93).

Enabling measures to support the roll-out of charging infrastructure can underpin and substantiate an automotive manufacturer's 1.5°C-compatible business model, but still critically hinge on the phase-out of internal combustion engines (ICEs).

Measures to address emissions from sourced materials to produce cars, vans, trucks, and buses (upstream scope 3)

Emissions from purchased goods and services to produce cars, vans, trucks, and buses (scope 3 category 1) represents the second largest emissions source across automotive manufacturers' value chains.

Sourcing of low-carbon steel, aluminium, and other materials

Critical transitional measure

The sourcing of low-carbon steel, aluminium and other upstream materials is highly relevant for the decarbonisation of an automotive manufacturer's value chain considering that the production of these materials is currently an emissions-intensive process (WEF, 2020, p. 15; W. Liu *et al.*, 2023).

To support the procurement of zero-carbon upstream materials, automotive manufacturers can, among other solutions, partner with suppliers committed to producing zero-emission upstream materials, invest in research and development of innovative production methods, or adopt responsible sourcing practices. Additionally, they can engage in circular economy practices, such as recycling and reusing components, to further minimise environmental impact and promote a more sustainable and decarbonised automotive industry.

Sourcing and/or in-house production of low-carbon batteries

Critical transitional measure

The manufacture of electric-vehicle batteries can account for up to 60% of the embedded greenhouse-gas emissions in electric vehicle production (Linder *et al.*, 2023, p. 2). For this reason, reducing emissions during the battery manufacturing stage is indispensable to fully harness the emissions mitigation capabilities of battery electric vehicles (Pathak *et al.*, 2022, p. 98). To support the external procurement or in-house production of zero-carbon batteries, automotive manufacturers can support the switch to renewable energy at every step throughout the battery value chain, invest in research and development of innovative production methods, and entre into strategic collaboration with suppliers of zero-carbon batteries.

5.3 Daimler Truck

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Automobiles	USD 53.6 bn (2022)	*Not available* (2022)	CO_2-neutrality on the roads and throughout the entire value chain globally by 2050	Poor	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

TRANSPARENCY & INTEGRITY

Tracking and disclosure: Not available in 2022

Major emission sources: Not available due to incomplete emissions disclosure.

Disclosure: No disclosure of upstream and downstream s3 emissions, critically undermining the understanding its emission profile across the value chain.

Subsidiary coverage: ? It is unclear whether subsidiaries are covered in the emissions reporting and disclosure.

		$MtCO_2e$
Downstream Scope 3	*Not disclosed*	?
Upstream Scope 3	*Not disclosed*	?
Scope 2		0.59
Scope 1		0.36

2 SETTING EMISSION REDUCTION TARGETS

TRANSPARENCY | INTEGRITY

Headline target or pledge: ***CO_2-neutrality on the roads and throughout the entire value chain globally by 2050***

Short-term targets (up to 2030)
- *Carbon neutrality for s1 and s2 by 2025 in EU, India, Japan, and USA*
- *42% absolute reduction in s1 and s2 by 2030 below 2021*
- *Aspirational ZEV sales share of "up to 60%" by 2030 for EU, USA, and Japan*

Scope coverage: S1 S2 S3↑ S3↓

Own emission reductions (compared to full value chain in 2019): ?

Aspirational and vaguely formulated ZEV sales share for key markets (EU, USA, Japan) with unclear impact. No other s3 reduction target.

Medium-term targets (2031 - 2040)
- *Carbon neutrality for s1 and s2 by 2039 globally*
- *Carbon neutrality for upstream s3 by 2039 in USA, EU and Japan*
- *100% ZEV sales by 2039 in EU, USA and Japan*

Scope coverage: S1 S2 S3↑ S3↓

Own emission reductions (compared to full value chain in 2019): ?

1.5°C-aligned target for 100% ZEV sales in key markets (EU, USA, Japan). No reduction pledges alongside scope-specific carbon neutrality targets.

Longer-term targets (2041 - onward)
- *Carbon neutrality for s1, s2 and s3 by 2050 globally*
- *Carbon neutrality for upstream s3 by 2050 globally*
- *100% ZEV sales by 2050 globally"*

Scope coverage: S1 S2 S3↑ S3↓

Own emission reductions (compared to full value chain in 2019): ?

1.5°C-aligned target for 100% ZEV sales globally by 2050. No reduction pledge alongside carbon neutrality targets (company-wide & scope-specific).

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	*Not available*	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	*Not available*	100% RE claim for most European sites with hourly matching, but no info on procurement constructs. 100% RE target for all sites globally by 2030.	Poor	?
Upstream emissions (scope 3)	*Not available*	Some minor actions to reduce upstream scope 3 emissions, but not addressing key sources such as steel. No details on timeline, scope and impact.	Very poor	Very poor
Downstream emissions (scope 3)	*Not available*	Relevant measures for use phase emissions, including ZEV technologies and charging infrastructure. Limited details on timeline and impact up to 2030.	Moderate	Moderate

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	Very poor	Very poor
Misleading offseting claims today	Carbon neutrality claim for European production sites (s1 and s2). Very limited information on type and amount of credits purchased in 2022.	Very poor	?
Approach to residual emissions	Unclear to what extent Daimler Trucks plans to rely on CDR to reach its various future carbon neutrality targets by 2039 and 2050.	Very poor	?

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Daimler Truck (2021, 2022a, 2022b, 2023) and Shades of Green (2023)*

Daimler Truck

Daimler Truck AG (hereafter: Daimler Truck) is one of the world's largest manufacturers of heavy-duty vehicles such as trucks and buses. Most of its emissions originate from the use phase of its sold trucks and buses, as well as sourced materials like steel, but the company does not disclose these emissions along its value chain. Ambitious sales targets for zero emission vehicles and plans to roll out charging infrastructure in key markets by 2039 and 2050 indicate the intend towards the 1.5°C-aligned transition by mid-century. However, significant gaps remain in Daimler Truck's climate strategy, particularly regarding the transparency and specificity on its reduction measures for 2030 and its offsetting strategy to meet its carbon neutrality pledges.

Daimler Truck has not disclosed any emissions related to its value chain since its spin-off from the Daimler AG in 2021. In the company's 2023 sustainability reporting, we could not identify any estimates or transparent explanations for this absence (Daimler Truck, 2022b, 2023a; Shades of Green, 2023, p. 5). While the company annually reports on its operational emissions (scope 1 and 2), emissions from the use-phase of sold heavy-duty vehicles and the sourcing of upstream products such as steel, aluminium or batteries represent by far the largest share of emissions along heavy-duty vehicle manufacturers' value chains.

Ambitious sales targets for zero emission vehicles in key markets by 2039 and globally by 2050 indicate Daimler Truck's intent to transition away from internal combustion engines in the longer term in alignment with the 1.5°C temperature goal. Daimler Truck pledges 100% sales of battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) in Europe, the United States and Japan by 2039 — and globally by 2050 (Daimler Truck, 2023a, pp. 78, 81–82, 93). These targets align with the 1.5°C-compatible milestones identified in the literature *(see detailed assessment in Annex II)*. For 2030, however, the company only sets an aspirational and non-committal intention to sell "up to 60%" of zero-emission vehicles in Europe, Japan, and the United States by 2030 (Daimler Truck, 2023a, pp. 78, 81, 93). The vague and non-committal wording of 'up to' gives the company leeway to sell significantly fewer vehicles. We could not identify any lower-bound or committal sales target for 2030. For this reason, we cannot assess the company's 2030 ambition.

Daimler Truck aims to meet the sales targets by promoting the roll-out of charging infrastructure. The company has formed two jointed ventures in its key markets of Europe and the United States (Daimler Truck, 2021, 2022a). In Europe, it has partnered with other manufacturers Traton and Volvo Group to invest EUR 0.5 billion in deploying a high-performance public charging network for battery electric trucks and coaches (Daimler Truck, 2021). In the United States, the company entered into a joint venture with a total funding volume of USD 0.65 billion to develop a nationwide charging network for BEV and FCEVs (Daimler Truck, 2022a).

Daimler Truck's carbon neutrality pledges for 2025, 2039 and 2050 remain unsubstantiated as the company provides no information on the extent to which it will reduce its own emissions. The company sets no specific emission reduction target accompanying its 2050 carbon neutrality pledge or for the scope- and geography-specific pledges between 2025 and 2050. Since the company's pledges do not entail any commitment to deep decarbonisation (i.e., a reduction of at least 90% of 2019 emissions across the entire value chain), labelling them as 'carbon neutrality targets' may mislead consumers and investors and does not align with recent guidance on meaningful target setting (ISO, 2022; UN HLEG, 2022; SBTi, 2023d).

Daimler Truck's climate strategy includes some smaller-scale activities to reduce upstream value chain emissions but does not provide comprehensive plans nor specific milestones to meet its targets. For example, Daimler Truck mentions participating in CDP's supply chain program or its plans to electrify logistics supplying the German Wörth production plant by 2030 (Daimler Truck, 2023a, pp. 90–91). While these are relevant measures Daimler Truck does not present a comprehensive package of measures, including their respective timelines, scope, and expected impact, to decarbonise purchased products and services like low-carbon steel. It remains unclear *how* the company intends to achieve its objective for carbon-neutral products and services in Europe, the United States and Japan by 2039 (Daimler Truck, 2023a, p. 78).

The lack of disclosure on procurement constructs to meet its 100% renewable targets undermines the promising setup of quarter-hourly matching for procured electricity by most European production sites. Daimler Truck claims that, in 2022, most of its European production sites have procured 100% renewable electricity from wind, solar, and hydropower while matching production and demand every quarter hour (Daimler Truck, 2023a, p. 94). However, the company does not disclose any information on the procurement constructs underpinning this claim. Similarly, the lack of information on future procurement constructs prevents an independent evaluation of its target to supply 100% renewable electricity to production sites in the United States, Japan, and India by 2025 and all in-house production sites globally by 2030 (Daimler Truck, 2023a, p. 94).

Daimler Truck provides limited information on the amount and type of carbon credits used to claim 'carbon neutral' production by European production sites in 2022. To make this claim, Daimler Truck has offset its scope 1 and scope 2 emissions at European production sites and selected other sites using Gold Standard-verified carbon credits for emission mitigation projects (Daimler Truck, 2023a, p. 94). Apart from illustrative project examples of geothermal energy installation and reduction of CO_2 emission during the process of drinking water purification, the company neither specifies the extent to which it relies on offset credits nor the type and prices for the credits purchased, making this claim highly ambiguous and contentious. All other carbon neutrality claims by Daimler Truck face similar issues as Daimler Truck does not communicate any integrity and sustainability criteria of its future offsetting strategy. Moreover, the focus of the carbon neutrality claim on production sites may be misleading to non-expert audiences, given that most of the company's GHG emission footprint derives from the use of vehicles. The *type* of vehicles manufactured vehicles is the most relevant climate issue, rather than the way in which the vehicles are produced.

5.4 Stellantis

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Automobiles	USD 188.9 bn (2022)	451.3 $MtCO_2e$ (2022)	Carbon net zero by 2038	Moderate	Moderate

1 TRACKING AND DISCLOSURE OF EMISSIONS

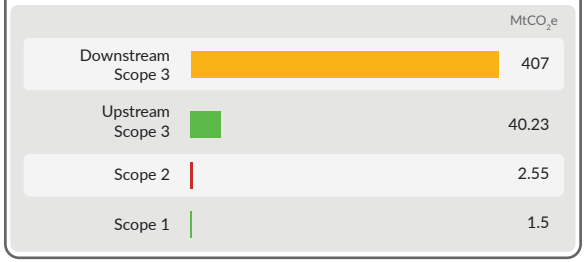
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 451.3 $MtCO_2e$ in 2022

Major emission sources: Use phase of sold vehicles (88% in 2022, downstream s3), purchased goods (9% in upstream s3).

Disclosure: S3 disclosure covers global value chain while having improved the alignment with third-party analysis. Only market-based s2 estimates consistently reported.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

TRANSPARENCY | INTEGRITY

Headline target or pledge: *Carbon net zero by 2038*

Short-term targets (up to 2030): *50% intensity reduction by 2030 across s1, s2, and s3 below 2021 supported by:*
- *s1 & s2: 75% absolute reduction by 2030,*
- *Upstream s3: 40% intensity reduction by 2030*
- *Purchased parts: 40% intensity reduction by 2030.*
- *EVs: 100% BEV sales in Europe and 50% BEVs in the US by 2030*

Scope coverage: S1, S2, S3↑, S3↓

Own emission reductions (compared to full value chain in 2019): **50%** by 2030 below 2021 (intensity)

Overarching 2030 target to reduce full value chain emissions intensity per vehicle by 50%, compared to 2021. 1.5°C-aligned ICE phaseout date for EU.

Medium-term targets (2031 - 2040): *Carbon net zero by 2038*

Scope coverage: S1, S2, S3↑, S3↓

Own emission reductions (compared to full value chain in 2019): **>90%** by 2038 below 2021 (intensity)

"All scopes covered. Deep emission intensity reduction commitment of at least 90% by 2038, compared to 2021. 1.5°C-aligned ICE phaseout date for EU."

Longer-term targets (2041 - onward): *Stellantis sets no longer-term target beyond 2041.*

Scope coverage: S1, S2, S3↑, S3↓

Own emission reductions (compared to full value chain in 2019): N/A

Stellantis sets no longer-term target beyond 2041.

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	<1% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	<1% of 2022 emissions	RE accounts for <30% of electricity consumption, mainly from RECs alongside some on-site installations and PPAs.	Reasonable	Very poor
Upstream emissions (scope 3)	9% of 2022 emissions	Vaguely specified plans to buy 'green materials' to meet a 40% intensity reduction target by 2030. Limited info on scope, actions and timelines.	Poor	?
Downstream emissions (scope 3)	90% of 2022 emissions	Relevant measures such as vehicle electrification. Measures not 1.5°C-aligned for all markets, and some future technologies uncertain.	Moderate	Moderate

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

TRANSPARENCY | INTEGRITY

Climate contributions today (Beyond-value-chain mitigation): Biodiversity and reforestation projects in Brazil. Details regarding the volume of finance not identified.

Misleading offseting claims today: *No offsetting claim identified.* — N/A | N/A

Approach to residual emissions: 9% of its 2021 emissions may be neutralised to claim net zero carbon emissions by 2038. Selection of CDR technologies pending.

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Stellantis (2022, 2023)*

Stellantis

Stellantis is an automotive company headquartered in the Netherlands, comprising brands such as Fiat, Peugeot, Opel and Citroën. Most of Stellantis' emissions originate in the use phase of its vehicles (88% of 2022 emissions). The company commits to reaching 'carbon net zero' in 2038, with its plans to reduce at least 90% of its vehicles' CO_2 emissions intensity across their life cycle and offset all remaining emissions. Stellantis' targets for 2025 and 2030 focus on short-term emissions reductions and vehicle electrification in key markets. They only partially align with the 1.5°C-aligned sectoral pathways for the automobile industry.

Key developments over the past year: We have identified only limited developments and minor updates to Stellantis' climate strategy since the previous analysis was published in February 2023 (Day, Mooldijk, Hans, *et al.*, 2023). In 2022, Stellantis disclosed its full global scope 3 emissions, whereas it previously only published partial scope 3 emissions for Europe in 2021. Furthermore, Stellantis no longer makes neutrality claims for its scope 1 and 2 emissions for its South American production facility in Goiania. Stellantis has further clarified the phrasing of both its overarching 2030 target across the entire value chain emissions and its carbon net-zero target by 2038, specifying that they are intensity targets instead of absolute reduction targets.

Stellantis commits to an ambitious overarching 2030 target to reduce its emissions intensity across the vehicle life cycle by 50% along the entire value chain compared to 2021 levels. The company plans to achieve this target based on several sub-targets for different emission sources: vehicle production, the vehicle use phase, and its supply chain (Stellantis, 2023a, pp. 59, 60–61). For emissions from the vehicle use phase, the company aims to sell 100% battery electric vehicles (BEVs) for passenger cars in Europe and 50% BEVs for passenger cars and light-duty trucks in the US by 2030. These two key markets were responsible for 45% and 31% of the company's sales in 2022, respectively. While Stellantis' target for the European market aligns with the 1.5°C-aligned decarbonisation milestones, its targets for the US market and aspirational sales shares for Brazil, India, and China, as outlined in its strategic blueprint Dare Forward 2030 (Stellantis, 2022), do not *(see detailed assessment in the Annex II)*.

Stellantis has not signed the clean-vehicle pledge announced at COP26 in November 2021, in which competing automakers from several countries, including the US and Germany, committed to exclusively producing electric vehicles by 2035 at the latest to support limiting global warming to 1.5°C (COP26 Presidency, 2021).

Stellantis' emissions reduction measures emphasise a rapid transition towards electric mobility, but the company continues to invest in the development of other technologies, such as e-fuels, hydrogen-based fuel cells, and biofuels with highly uncertain efficiency and sustainability. To support the electrification of its vehicle fleet as part of its effort to reduce downstream scope 3 emissions, Stellantis implements several vehicle charging solutions. For example, Stellantis is investing in the development of a public fast charging network slated to operate 35,000 fast chargers by 2030 across Southern Europe, with additional undisclosed numbers in North America (Stellantis, 2023a, pp. 39–40). The company also invests in measures to reduce emissions in the vehicle use phase. These include enhancing fuel efficiency in existing combustion engine vehicle lines, exploring alternative fuels like e-fuel produced with hydrogen energy, and hydrogen-based fuel cells for vehicle propulsion. However, these latter two drive technologies would require significantly more renewable electricity production compared to BEVs (Transport & Environment, 2018).

Stellantis remains vague on specific measures to decarbonise its upstream scope 3 emissions from sourced materials. In 2022, the company stated that 'more than 65% of strategic [...] suppliers committed to comply with the Paris Agreement'; the company aims to increase this share to 95% by 2030 (Stellantis, 2023a, p. 62). The company also plans to increase the share of so-called 'green materials' in its vehicles, aiming to launch the first vehicles containing 25% of them by 2025 (Stellantis, 2023a, p. 51). Stellantis defines green materials as recycled materials, materials of natural origin, and bio-sourced materials but remains vague on specific underlying definitions (Stellantis, 2023a, p. 329). While Stellantis introduces a higher-level approach to address its upstream supply chain emissions alongside its target to cut the carbon footprint of purchased parts for its BEV by 40% by 2030 (Stellantis, 2023a, p. 64), the company has yet to disclose specific information on intended measures and procurement targets for low-carbon steel and other emission-intensive materials (Stellantis, 2023a, pp. 125–127).

Stellantis aims to achieve 'carbon net zero' across its value chain by 2038 while limiting the use of offsets to less than 10% of its 2021 emissions. As part of this commitment, the company commits to reducing its emissions intensity across its vehicles' life cycles by at least 90% compared to 2021 (Stellantis, 2023a, pp. 62–63). Stellantis plans to offset the remaining emissions through carbon dioxide removals and other offsetting solutions. The company remains in the process to developing its offsetting strategy carbon including the selection of adequate carbon removal technologies (Stellantis, 2023a, p. 64).

In a departure from its stance in 2021, Stellantis no longer claims that it offsets current scope 1 and 2 emissions from its Brazilian plant in Goiania. It also seems that Stellantis is no longer procuring carbon credits from projects such as energy generation from landfill waste, reforestation, and environmental restoration efforts (Stellantis, 2023a, p. 115). Instead, Stellantis continues to provide financial support for climate actions beyond its immediate value chain without asserting the neutralisation of its own emissions. This is reflected in its adoption of a climate contributions approach through initiatives to support and restore biodiversity (Stellantis, 2023a, p. 401). However, we could not identify any information on the extent of these contributions.

Stellantis currently relies mainly on lower-quality RECs to claim a share of 27% renewables in its electricity consumption. The company surpassed its 2025 target of reaching 50% *decarbonized* electricity by 2025, reporting a share of 55% in 2022. However, the company does not clearly define what it means by '*decarbonized*' electricity, which could include renewables, nuclear, and potentially other lower carbon technologies (Stellantis, 2023a, p. 124). Its renewable electricity consumption accounted for only 27% of its total electricity consumption in 2022 (Stellantis, 2023, p. 113). With no specific renewable electricity target set, its goal to achieve 100% *decarbonized* electricity by 2030 does not guarantee a high share of renewable electricity (Stellantis, 2023a, p. 48). The company currently procures most of its renewable electricity through lower-quality RECs, likely with limited impact on fostering additional new renewable generation capacity (Stellantis, 2023a, p. 114). Alongside RECs, the company procures less than 2% of its renewable electricity through higher-quality PPAs and its own on-site generation capacity (Stellantis, 2023, p. 114). The company does not disclose further information on the procurement constructs it plans to rely on in the future to meet its 100% *decarbonized* electricity target in 2030 (Stellantis, 2023a, p. 113).

This page was updated in August 2024:
The transparency rating for Toyota's short-term target was changed from *Moderate* to *Reasonable*.

5.5 Toyota

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Automobiles	USD 282.6 bn (2022)	616.7 $MtCO_2e$ (2022)	Carbon neutral by 2050	◔ Poor	◌ Very poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

TRANSPARENCY & INTEGRITY

Tracking and disclosure: 616.7 $MtCO_2e$ in 2022

Major emission sources: Use phase of sold vehicles (downstream s3, 79%); purchased goods and services (upstream s3, 20%)

Disclosure: Toyota discloses emissions across all scopes but third-party analysis calls integrity of downstream s3 disclosure into question. Subsidiaries also partially excluded in latter.

Subsidiary coverage: ◑ Subsidiaries are only partially covered in the emissions reporting and disclosure.

	$MtCO_2e$
Downstream Scope 3	527.54
Upstream Scope 3	121.75
Scope 2	3.81
Scope 1	2.37

2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	*Carbon neutral by 2050*		
Short-term targets (up to 2030)	*"s1, s2 & s3 - vehicle life-cycle emissions intensity reduction • 30% reduction by 2030 below 2019* *s3 - vehicle use-phase emissions intensity • 33.3% reduction for LDVs by 2030 below 2019 • 11.6% reduction for HDVs by 2030 below 2019"*	◕	◌
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
	No 1.5°C-aligned phaseout dates for ICEs. Intensity targets for life-cycle and use-phase emissions not quantifiable.		
Medium-term targets (2031 - 2040)	*"s1 & s2 • - 65% absolute reduction by 2035 below 2019 • - Carbon neutrality by 2035 (offsets allowed)* *s3 - vehicle use-phase emissions intensity • - 50% reduction by 2035 below 2019"*	◑	◌
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
	No 1.5°C-aligned phaseout dates for ICEs. Target for s1 & s2 equals a 1% reduction across the value chain, S3 intensity target not quantifiable.		
Longer-term targets (2041 - onward)	*Carbon neutral by 2050 (group-wide) and additional scope-specific carbon neutrality pledges by 2050*	◌	◌
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
	All emission scopes covered. No emission reduction commitment alongside carbon neutrality pledges by 2050. No 1.5°C-aligned phaseout dates for ICEs.		

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	<1% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	1% of 2022 emissions	Very limited information on RE procurement in public reporting. RE accounts for just 20% of electricity demand in 2022 with aim to reach 25% in 2025.	◌	◌
Upstream emissions (scope 3)	20% of 2022 emissions	No measures identified that aim to reduce upstream scope 3 emissions.	◌	◌
Downstream emissions (scope 3)	79% of 2022 emissions	Some measures on vehicle electrification but limited details on scope and timelines. Development of other LDV technologies with highly uncertain efficiency and impact.	◔	?

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	◌	◌
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	Targets for 2035 (>2.2 $MtCO_2e$) and 2050 (extent unclear) depend on CDR. No information on criteria for type of projects.	◌	?

5-point rating scale: ● High ◕ Reasonable ◑ Moderate ◔ Poor ◌ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Toyota (2023a, 2023b, 2023c), Toyota Europe (2021, 2023a, 2023b), and Hino (2022, 2023a, 2023b)*

Toyota

Toyota Motor Corporation (hereafter: Toyota) is one of the world's largest manufacturers of motor vehicles. Most of the company's emissions footprint derives from the use of its sold cars, vans, trucks, and buses (79% of 2022 emissions) and from sourced materials such as steel (20%). Toyota's climate strategy is critically undermined by a general lack of transparency and specificity in its emission disclosure, emissions reduction measures and pledges. Toyota's plans for light- and heavy-duty vehicle electrification fall significantly short of 1.5 °C-aligned decarbonisation milestones for the automobile industry.

Key developments over the past year: We could identify only minor changes to Toyota's climate strategy since the company was previously analysed as part of the '*Assessing Net Zero – Integrity Review of 10 Japanese Companies*' report, published in May 2023, using the *Corporate Climate Responsibility Monitor 2022* methodology (Odawara and Hirata, 2023, pp. 35–37). Accordingly, differences in evaluation mainly result from the further development of our methodology and evaluation criteria (NewClimate Institute, 2024).

Toyota's headline and scope-specific carbon neutrality pledges for 2050 remain unsubstantiated as the company provides no information on the extent to which it will reduce its own emissions. Apart from vague references to the Paris Agreement's temperature limit (for example reference in Toyota, 2023b, p. 23), the company does not explain how its 2050 carbon neutrality pledges align with key 1.5°C-compatible decarbonisation milestones for the automobile industry *(see detailed assessment in Annex II)*. The company does not disclose any further information on the extent to which it will reduce its own emissions by 2050 as part of this pledge and only vaguely communicates its intention to rely on carbon credits by an undefined amount to meet its 2050 target (Toyota, 2023b, p. 45).

The interim targets for 2030 and 2035 do not include commitments to phase out internal combustion engines for light-duty vehicles in key markets by 2030 or shortly thereafter, falling significantly short of 1.5°C-aligned climate action in the automobile sector. Only for the European Union and the United Kingdom, Toyota has set a target to reach a 50% sales share of electric light-duty vehicles by 2030 and to only sell zero-emission vehicles by 2035 (Toyota Europe, 2021, 2023a, 2023b, p. 5). However, this targeted sales share for 2030 merely reflects the automobile sector's business-as-usual development for Europe, rather than the 1.5°C-compatible climate ambition going beyond this. The IEA estimates that the EV sales share for Europe will reach around 50% under its stated policies and announced pledges scenario (IEA, 2023b, p. 114), while electric light-duty vehicle sales for Europe and other key markets should reach 95%–100% by 2030 to stay below the Paris Agreement's warming limit of 1.5°C (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4). We cannot not identify any such targets for other key markets for light-duty vehicles such as Japan, the United States or China. Toyota's Chairman Akio Toyoda as recently as January 2024 states that Toyota will reach not more than 30% of electric vehicles in total sales (Takahashi, 2024). We cannot identify any specific targets for the phase in of zero-emission heavy-duty vehicles by 2030 *(see Box 2)*.

Alongside fully battery electric vehicles, Toyota further invests in the development of other technologies with highly uncertain efficiency and sustainability as key pillars of its light-duty vehicle decarbonisation strategy, such as hydrogen, e-fuels, and biofuels. Toyota does not communicate its intended sales share for each of those technologies by 2030 or thereafter (Toyota, 2023b, pp. 19, 22–23, 2023c, p. 6). Recent scientific literature raises concerns on energy efficiency and sustainability for all of these technologies to effectively and efficiently decarbonise light-duty vehicle transport towards 2030 and beyond (Jaramillo *et al.*, 2022, pp. 1064–1071). E-fuel produced with hydrogen and hydrogen-based fuel cells, for example, would require much greater amounts of renewable electricity production than BEVs (Transport & Environment, 2018). The absence of a specific timeline for the complete phase-out of internal combustion engines for light-duty vehicles in key markets towards 2030 and the promotion of technologies other than battery electric vehicles leaves major gaps in Toyota's climate strategy *(see detailed assessment in Annex II)*.

Toyota has also not signed the non-legally binding COP26 declaration, which commits to a fully electric fleet by 2035 in alignment with the 1.5°C target of the Paris Agreement as of April 2024. This is in contrast to competing manufacturers that have already signed up to it (COP26 Presidency, 2021; A2Z Coalition, 2023). Recent analysis also suggests that Toyota's disclosed life-cycle emissions of sold vehicles are underreported by more than 60%, primarily due to unrealistic assumptions regarding vehicle lifetimes (Bonaccorsi *et al.*, 2022).

Toyota's climate strategy discloses limited details on its activities to reduce emissions from sourced upstream materials such as low-carbon steel, despite representing almost one-fifth of its emissions across the value chain. For the procurement of low-carbon steel, for example, Toyota only provides information on small-scale pilots for its race-car vehicle production (Toyota, 2023b, p. 23; W. Liu *et al.*, 2023, p. 13). We could not identify any measures or plans aimed at systematically reducing emissions from purchased steel and other sourced products. As for the production of batteries, Toyota aims to further develop lithium-ion and solid-state batteries with enhanced performance towards 2026 as part of its technological roadmap (Leussink, 2023; Toyota, 2023a, p. 3). While in-house battery production would enable Toyota to directly influence battery-related emissions by decarbonising its own scope 1 and 2 emissions, we could not identify any plan or activities to reduce these emissions in the future. For the procurement of renewable electricity — one of the key levers to reduce emissions from battery production — the company provides little information on its renewable procurement strategies, despite claiming a 20% share of renewable electricity in 2022 and aiming to reach 25% by 2025 (Toyota, 2023b).

Toyota remains vague on its offsetting strategy to meet its carbon neutrality targets for 2035 and 2050. In 2035, Toyota plans to offset at least 2.2 $MtCO_2e$ to fulfil its carbon neutrality target for operational emissions. The company intends to reduce 68% of its scope 1 and 2 emissions by 2035 below 2019 levels and to offset the remaining 32% (Toyota, 2023b, p. 45). It is unclear to what extent the company plans to rely on carbon credits to achieve its 2050 carbon neutrality pledge. The company neither communicates the type of carbon credits nor any integrity criteria for its future purchases, making these carbon neutrality pledges highly ambiguous and contentious.

Box 1: Analysis of Toyota's subsidiary Hino producing heavy-duty vehicles

Toyota produces heavy-duty trucks and buses through its subsidiary Hino. Hino's revenue of USD 11.5 billion in the financial year of 2023 (April 2022 to March 2023) accounts for around 4% of Toyota's total revenue over the same period (Hino, 2023a, p. 15). Hino's total emissions amount to 41 $MtCO_2e$ for 2021 (Hino, 2022, p. 57), of which around 93% originate in the use phase of sold heavy-duty vehicles. Toyota does not include these downstream emissions from the use of HDVs in its group-wide emissions disclosure (Toyota, 2023b, p. 47, see footnote 2 of Table A).

The lack of detailed information on base year emissions data or the link between group- and subsidiary-level intensity targets raises questions about Hino's target setting for 2030 and beyond. Similar to Toyota's group-level pledge, Hino's carbon neutrality target for 2050 lacks substantiation, with no information provided on the extent to which the carbon neutrality target is to be achieved through emission reductions as opposed to offsetting (Hino, 2022, 2023b). In the period leading up to 2030, Toyota and Hino commit to different intensity reduction targets for the heavy-duty vehicles' use phase. Toyota aims for an 11.6% reduction below 2019 levels, while Hino targets a 40% reduction below 2013 levels. We could neither identify any explanation on how these targets relate to each other nor the disclosure of any base year emissions data for Hino's scope 3 emissions in 2013. Additionally, we cannot identify specific targets for the phase-in of zero-emission heavy-duty vehicles by 2030, neither at the group level by Toyota nor at the subsidiary level by Hino *(see detailed assessment in Annex II)*.

Hino provides limited information on its implemented or planned measures to achieve its emission reduction targets. We cannot identify targets for the phase-in of zero-emission heavy-duty vehicles by 2030, nor the expansion of related charging infrastructure (for example in Hino, 2022, 2023b). Recent literature indicates that globally 30–37% of heavy-duty trucks should be battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) by 2030 to align with the 1.5°C Paris Agreement temperature limit (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). Hino also does not communicate any information on measures to address emissions related to the procurement of upstream materials such as low-carbon steel.

5.6 Volkswagen Group

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Automobiles	USD 293.6 bn (2022)	727.6 $MtCO_2e$ (2022)	Carbon neutral by 2050	Poor	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

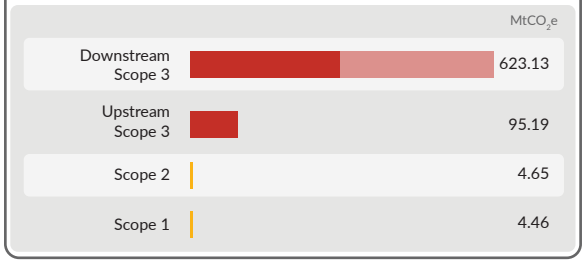
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 727.6 $MtCO_2e$ in 2022

Major emission sources: Use phase of sold vehicles (downstream s3, 86%); purchased goods and services (upstream s3, 13%)

Disclosure: Emissions disclosed for all scopes but third-party analysis questions integrity of LDV downstream s3 disclosure. All HDV-related scope 3 emissions fully excluded from group-level disclosure.

Subsidiary coverage: ◐ Subsidiaries are only partially covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	*Carbon neutral by 2050*		
Short-term targets (up to 2030)	• *50% absolute reduction of s1 and s2 by 2030 below 2018* • *30% intensity reduction of LDVs life-cycle emissions by 2030 below 2018* • *Various EVs sales targets for different geographies*	◐	◔
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
	No 1.5°C-aligned phaseout dates for ICEs. Target for s1 & s2 equals a 3% reduction across the value chain, S3 intensity for 2025 no longer mentioned.		
Medium-term targets (2031 - 2040)	*Volkswagen sets no medium-term emissions reduction target towards 2040.*	◌	◌
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
	No medium-term emissions reduction target towards 2040 identified. Several aspirational brand-specific EVs sales targets.		
Longer-term targets (2040 - onward)	*Carbon neutral by 2050*	◌	◌
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
	All emission scopes covered. No emissions reduction commitment alongside carbon neutrality pledge. No 1.5°C-aligned phaseout dates for ICEs.		

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
			N/A	N/A
Operational emissions (scope 1)	1% of 2022 emissions	*Not assessed.*		
Renewable electricity (scope 2)	1% of 2022 emissions	Extensive use of low-quality RECs to claim 99% of renewable electricty procured in Europe in 2022. Plans to use more PPAs in the future but limited information provided.	◐	◌
Upstream emissions (scope 3)	13% of 2022 emissions	Several intended activities to reduce upstream scope 3 emissions mentioned but very limited details on timeline, milestones and expected impact.	◔	?
Downstream emissions (scope 3)	86% of 2022 emissions	Relevant measures for key emission sources, including investments in vehicle electrification. Limited details on timeline and expected impact.	◐	◐

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	Climate contributions through Volkswagen Financial Services for project protecting moorlands in Germany. Details on financial volume not identified.	◔	?
Misleading offseting claims today	5.9 $MtCO_2e$ credits in 2022 for various claims (e.g. carbon neutral production sites). Mainly land sequestration CDR and 'lowest-hanging fruit' projects.	◔	◌
Approach to residual emissions	2050 target depends on CDR to unclear extent. A joint venture with ClimatePartner develops land sequestration CDR.	◌	?

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ◌ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Volkswagen (2023a, 2023b, 2023c),Volkswagen ClimatePartner (2024), Traton (2023a, 2023b), MAN (2023), Navistar (2023), Scania (2023), Volkswagen Truck & Bus (2023), and FMC (2022a, 2022c)*

Volkswagen Group

Volkswagen AG (hereafter: Volkswagen Group) is one of the world's largest manufacturers of motor vehicles. Most of the company's emissions originate in the use phase of its sold cars, vans, trucks, and buses (86% of 2022 emissions) and from sourced materials such as steel (13%). Over the last three years, the company has shown little progress in aligning its group-level climate targets with the latest science and voluntary standards. The company aims to become carbon neutral by 2050 but has not clarified the extent to which it will reduce emissions to achieve this pledge. Despite a range of emission reduction measures across all scopes, Volkswagen's climate strategy for light-duty vehicle electrification and its 2030 targets fall short of decarbonisation milestones for the automobile industry to be in line with the Paris Agreement's 1.5°C global warming limit.

Key developments over the past year: We have identified only limited developments and minor updates to Volkswagen's climate strategy since the previous analysis was published in February 2023 (Day, Mooldijk, Hans, *et al.*, 2023). In 2023, for example, the company increased its targeted share of fully electric vehicles sold in Europe from 60% to 70%. Volkswagen has neither provided further clarity on its 2050 carbon neutrality target nor committed to specific phase-out dates for internal combustion engines. A first-time analysis of Volkswagen's subsidiary Traton, which manufactures all of Volkswagen's heavy-duty vehicles, has further revealed that Volkswagen does not include any of the scope 3 emissions from heavy-duty vehicles in its group-level emissions disclosure.

Volkswagen has shown no progress in enhancing its group-level targets, which remain incompatible with the Paris Agreement 1.5°C temperature limit, and no longer publicly refers to its 2025 target. Notably, there has been no improvement in providing details for Volkswagen's 2050 carbon neutrality target, initially announced in 2019, despite requirements for long-term pledges laid out by the UN High-Level Expert Group and the International Organization for Standardization (ISO, 2022; UN HLEG, 2022). It remains entirely unclear to what extent the carbon neutrality target is to be achieved through emission reductions, as opposed to offsetting. The company also lacks any emission reduction target for its upstream value chain emissions towards 2030 and beyond, despite being responsible for 13% of its 2022 emissions.

We can no longer find any public reference by Volkswagen to its 2025 reduction target for vehicle use-phase emission intensity in the sustainability reporting of 2023 (Volkswagen, 2023b, 2023a). The target aimed at reducing emission intensity by 30% between 2018 and 2025 was critically undermined by the unspecified role of offsetting (see previous assessment in Day, Mooldijk, Hans, *et al.*, 2023, pp. 115–116, 159–160). The discontinuation of the target, rather than its clarification, would leave the company without any tangible emission reduction goal within the next five years. Recent analysis further suggests that Volkswagen currently underreports its disclosed life-cycle emissions of sold vehicles by more than 50% due to unrealistic assumptions on vehicle lifetimes (Bonaccorsi *et al.*, 2022, p. 15).

Despite recent integrity issues with carbon credits purchased in the voluntary carbon market, Volkswagen's climate strategy continues to rely on offsetting to meet its group-wide carbon neutrality target for 2050 and to make present-day carbon neutrality claims for production lines. Volkswagen had been acquiring carbon credits from the Kariba mega-project in Zimbabwe. In 2022 alone, the company purchased carbon credits of around 1.1 $MtCO_2e$ from this project (Volkswagen, 2023a), representing roughly 20% of the total 5.9 $MtCO_2e$ purchased that year. However, the Swiss project developer South Pole, who ran the Kariba mega-project, decided to terminate and withdraw from the project entirely in October 2023 following allegations of inflated climate benefits and issues related to due diligence (Elgin and White, 2023). This case underscores the inherent risks associated with offsetting practices relying on carbon credits to offset rather than reduce emissions along the companies' value chain *(see Section 3.1)*. Besides purchasing carbon credits in the voluntary carbon market, Volkswagen formed a joint venture with Climate Partner in 2022 to develop its own projects for issuing carbon credits from biological carbon dioxide removal. The companies have not yet provided any further information on the scope and timeline of its future activities (Volkswagen ClimatePartner, 2024).

Volkswagen does not commit to the phaseout of internal combustion engines for light-duty vehicles sold in key markets by 2030, significantly falling short of 1.5°C-aligned climate action in the automobile sector. Volkswagen increased its targeted share for electric light-duty vehicles sold in Europe by 2030 from 60% to 70%, while continuing to commit to at least a 50% share in China and the US (Volkswagen, 2023c, p. 8). In these main markets, electric light-duty vehicles sales should reach 95%–100% by 2030 to stay below the Paris Agreement's warming limit of 1.5°C (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4). The absence of a specific timeline for the complete phaseout of internal combustion engines for key markets towards 2030 or shortly thereafter leaves major gaps in the company's climate strategy *(see detailed assessment in Annex II)*. Unlike some other automobile manufacturers in the US or Germany, Volkswagen has also not signed the COP26 declaration committing to only sell electric vehicles by 2035 to support achieving the 1.5°C target of the Paris Agreement as of April 2024 (COP26 Presidency, 2021; A2Z Coalition, 2023). Despite the shortcomings of Volkswagen's targets for light-duty vehicles, sales targets for heavy-duty zero-emission vehicles by 2030 do meet the 1.5°C Paris Agreement compatible milestones for most of Volkswagen's brands *(see Box 1)*.

The climate strategy provides limited details on the scope, timeline, and indented impact of Volkswagen's activities to reduce emissions of purchased upstream materials such as steel and batteries. Volkswagen, for example, has signed a memorandum of understanding with steel producer Salzgitter to become one of its first customers of low-CO_2 steel. The company also plans to set binding CO_2 targets for suppliers of upstream materials, such as battery manufacturers (Volkswagen, 2023b, pp. 42–43; W. Liu *et al.*, 2023, p. 14). Despite these steps in the right direction, the lack of details and specific milestones hinders an independent assessment of their level of ambition and comprehensiveness.

Box 2: Analysis of Volkswagen Group's subsidiary Traton producing heavy-duty vehicles

Volkswagen produces heavy-duty trucks and buses through its subsidiary Traton. Traton manages four different vehicle brands: Scania, MAN, Navistar, and Volkswagen Truck & Bus. In 2022, Traton generated revenue of EUR 40.3 billion in 2022 (ca. USD 42.5 billion), accounting for around 14% of Volkswagen Group's total revenue for the same year (Traton, 2023b).

Traton does not disclose consolidated up- and downstream scope 3 emissions across its four brands. The annual emissions from the use-phase of sold heavy-duty vehicles might be way higher than 300 $MtCO_2e$ considering the most recently published sustainability reports by each of the four brands (MAN, 2023, p. 17; Navistar, 2023, p. 56; Scania, 2023, p. 156; Volkswagen Truck & Bus, 2023, p. 137). As of April 2024, the Volkswagen Group does not include any of the scope 3 emission for its four heavy-duty vehicles' brands in its annual emissions disclosure. Traton only reports consolidated scope 1 and scope 2 emissions (Traton, 2023a, p. 29).

Traton's brand-level targets for selling zero-emission vehicles by 2030 mostly align with 1.5°C Paris Agreement-compatible milestones for heavy-duty vehicles by 2030. While Traton does not set any group-level emission reduction targets across all heavy-duty vehicle brands, each individual brand commits to its own targets (Traton, 2023a, pp. 17–20). MAN, Scania and Navistar International Cooperation — covering 26 out of Volkswagen Group's 28 production sites for heavy-duty vehicles — all pledge to reach a minimum 40% sales share for heavy-duty zero-emission vehicles by 2030 (Traton, 2023a, p. 17). These commitments are in line with the 1.5°C Paris Agreement-compatible decarbonisation milestones for heavy duty trucks. Scania (net-zero carbon by 2040) and MAN (greenhouse gas neutral by 2050) additionally commit to net-zero targets under the SBTi Net Zero Standard (Traton, 2023a, p. 12). As with Volkswagen Group's overarching carbon neutrality target, we were unable to identify any post-2040 emission reduction target by the two brands alongside the subsidiary-level net-zero and carbon neutrality pledges

Traton and its brands have started to implement measures to support the roll-out of charging infrastructure and reduce emissions of upstream materials, although uncertainties regarding their scope and intended impact remain. Scania, for example, commits to procuring "100% green batteries, green steel, green aluminium, and green cast iron in its European production by 2030". The commitment lacks specificity on how much it aims to reduce emissions versus relying on offsetting to meet this claim (Traton, 2023a, p. 13). As a member of The First Mover Coalition, Scania also aims to procure at least 10% of low-carbon steel and aluminium by 2030 (FMC, 2022c, 2022a). However, the effectiveness of these steps in achieving the claimed '100% green' procurement of zero-emission steel or aluminium remains uncertain. It is also unclear to what extent the cooperation between Scania and H2 Green Steel will cover Scania's steel demand in 2023 (Volkswagen, 2023b, p. 43). Traton also contributes to the establishment of charging infrastructure, with more than 1,700 public charging points in Europe as part of its joint venture that involves a EUR 0.5 billion investment, alongside Daimler Truck and Volvo Group (Traton, 2023a, p. 18).

5.7 Volvo Group

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Automobiles	USD 46.8 bn (2022)	299.4 $MtCO_2e$ (2022)	Net-zero value chain emissions by 2040	Moderate	Moderate

1 TRACKING AND DISCLOSURE OF EMISSIONS

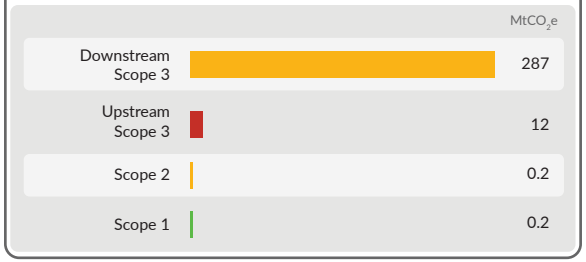
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 299.4 $MtCO_2e$ in 2022

Major emission sources: Use phase of sold vehicles (downstream s3, 96%); upstream supply chain (upstream s3, around 4%)

Disclosure: s1, s2 and emissions from sold vehicles transparently disclosed. Estimates for upstream scope 3 emissions still under development.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

TRANSPARENCY | INTEGRITY

Headline target or pledge: *Net zero emissions before 2040*

Short-term targets (up to 2030)

"s1 & s2 below 2019
- *50% absolute reduction by 2030*

s3 - vehicle life-cycle emissions below 2019
- *40% intensity reduction by 2030 for heavy-duty trucks*
- *40% intensity reduction by 2030 for buses*
- *30% absolute reduction by 2030 for construction equipment"*

Scope coverage: S1 S2 S3↑ S3↓

Own emission reductions (compared to full value chain in 2019): ?

Intensity or absolute targets for each vehicle type. 1.5°C-aligned target for 35% ZEV sales globally for heavy-duty trucks, but not for buses and other types.

Medium-term targets (2031 - 2040)

- *"37.5% absolute reduction for industrial and marine engines' life-cycle emissions by 2034 below 2019*
- *Net zero by 2040"*

Scope coverage: S1 S2 S3↑ S3↓

Own emission reductions (compared to full value chain in 2019): ?

No reduction pledge alongside 2040 net-zero target. Only aspirational ZEV sales shares towards 2040 under 'illustrative 1.5°C scenario'.

Longer-term targets (2041 - onward)

No additional long-term target(s) beyond 2040 identified.

Scope coverage: S1 S2 S3↑ S3↓

Own emission reductions (compared to full value chain in 2019): N/A

Same issues as for medium term with an unsubstantiated 2040 net-zero target and merely aspirational ZEV sales shares towards 2050

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	<1% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	<1% of 2022 emissions	Claim of 48% renewable energy use in 2022. No target identified towards 2030 or beyond. No disclosure of renewable energy procurement constructs.	○	?
Upstream emissions (scope 3)	4% of 2022 emissions	Low-carbon steel and aluminium procurement targets for 2030 (min. 10% each). No activities identified for other upstream emission sources.	◐	◐
Downstream emissions (scope 3)	96% of 2022 emissions	Relevant measures for use phase emissions, incl. ZEV technologies and charging infrastructure. Continued ICE sales by 2040 using bio- and e-fuels.	◐	◔

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

TRANSPARENCY | INTEGRITY

Climate contributions today (Beyond-value-chain mitigation): *No climate contributions identified.* — ○ | ○

Misleading offseting claims today: *No offsetting claim identified.* — N/A | N/A

Approach to residual emissions: Net-zero target set for 2040 but no clarity on the extent to which the company will rely on CDR. — ○ | ?

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Volvo Group (2021, 2023a, 2023b, 2023c, 2024) and FMC (2022a, 2022b, 2022c)*

Volvo Group

Note to readers: *This assessment exclusively focuses on the climate strategy of AB Volvo as a producer of heavy-duty vehicles. It does not assess the business activities and climate strategy of the Volvo Car Group, which produces light-duty vehicles. The two companies operate independently of each other, despite sharing the Volvo brand name.*

AB Volvo (hereafter: Volvo Group) is one of the world's largest manufacturers of heavy-duty vehicles, such as trucks, buses, industrial and marine engines. Most of the company's emissions originate from the use phase of its vehicles and engines (96% of 2022 emissions) and from sourced materials such as steel (~4%). The company commits to ambitious targets and measures to phase in zero-emission vehicles leading up to 2030. Its climate strategy also introduces the first credible steps to address emissions from the upstream value chain. However, the Volvo Group's plans for climate action beyond 2030 lack transparency and specificity.

Volvo Group transparently discloses its operational and use phase emissions of sold vehicles, while reporting on all other emissions in the up- and downstream value chain is still under development. An explorative analysis conducted by the company estimates that emissions in the upstream value chain — such as those from the sourcing of steel, aluminium, and other materials — accounted for approximately 4% of total emissions in 2022 (Volvo Group, 2023a, pp. 23, 154–155, 177). No further explorative analysis of a similar kind has been done for other downstream value chain emissions, such as those associated with the end-of-life treatment of sold vehicles. For this reason, we estimate Volvo Group's total emissions to be at least 299 $MtCO_2$ in 2022, but likely higher if other categories not estimated currently were to be included.

The company's transparent and ambitious targets towards 2030 put a distinct focus accelerating the needed phase in of zero-emission vehicles in this crucial period for the global efforts to limit climate change. For this period, the company sets vehicle type-specific reduction targets for use-phase emissions (Volvo Group, 2023a, p. 151), including intensity targets for heavy-duty trucks and buses, and absolute reduction targets for construction equipment, industrial, and marine engines. In addition, the target to sell "at least" 35% of electric vehicles by 2030 across all vehicle types globally meets the 1.5°C-compatible benchmarks for heavy-duty trucks, which accounted for 66% of Volvo Group's revenue in 2022 (Volvo Group, 2023a, pp. 16, 151). However, for buses, which represented 4% of Volvo Group's revenue in 2022, the sales share of battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) must reach between 56–60% by 2030 globally and 100% by 2030 in advanced economies and China *(see detailed assessment in Annex II).*

The Volvo Group shows less transparency and specificity for the period beyond 2030. While the phase-in of BEVs and FCEVs will likely accelerate towards 2040, the company has not committed to specific sales targets for this period. Instead, it refers to aspirational developments under an "illustrative scenario for 1.5°C" (Volvo Group, 2023a, pp. 16, 155). The company plans for phasing in zero-emissions vehicles (ZEVs) towards 2040 are further called into question as it intends to continue selling vehicles with internal combustion engines (ICEs) running on biofuels, such as renewable liquid, hydrogenated vegetable oil, and biogas to an unspecified extent (Volvo Group, 2023a, pp. 16, 155). Although Volvo Group acknowledges the limited availability of sustainable biofuels (Volvo Group, 2023a, p. 158), it does not outline any specific criteria or guidelines to ensure the fuels' sustainability (Volvo Group, 2023b). The use of biofuels at scale faces multiple sustainability issues and should be avoided if technological alternatives are readily available *(see more information in Section 3.5).*

Comprehensive measures support the phase-in of electric vehicles by 2030 and take the first credible steps to address emissions from the upstream value chain. The company formed a joint venture together with Traton and Daimler Truck jointly investing EUR 0.5 billion to roll out a high-performance public charging network for battery electric trucks and coaches (Volvo Group, 2023a, p. 35). The company also invests in the R&D and the expansion of own production capacities for batteries and hydrogen fuel cells (Volvo Group, 2023a, pp. 18–19; 189). To address its upstream value chain emissions, Volvo Group is one of the world's first vehicle manufacturers to publicly set procurement targets for low-carbon alternatives to production materials like steel. As a founding member of The First Mover Coalition, the company commits to sourcing *at least* 10% of low-carbon steel and primary aluminium (FMC, 2022c, 2022a; Volvo Group, 2023a, p. 177). For the purchase of low-carbon steel, the company entered into supply agreements with SSAB in 2021 and with H2 Green Steel starting in 2026 (Volvo Group, 2021, 2023c, 2023a). Through these agreements, the company produced its first vehicle with zero-carbon steel in 2021 and began introducing fossil-free steel into parts of its vehicle product range in 2022 (Volvo Group, 2023a, p. 33). In 2023, the company started partnering with Norsk Hydro to establish a roadmap for increasing 'near zero' aluminium use before 2030 and supplying 'net zero' aluminium in 2040 (Volvo Group, 2024). Volvo Group does not specify what it means by near zero or net zero aluminium.

The climate strategy remains unsubstantiated in defining Volvo Group's 2040 net-zero target related to offsetting and renewable electricity procurement. The company discloses neither the extent to which it will reduce its own emissions by 2040 as part of this pledge, nor the amount and type of carbon credits it intends to use to claim net zero. Recently published guidance on meaningful net-zero target setting emphasises both of these aspects (ISO, 2022; UN HLEG, 2022; SBTi, 2023d). While Volvo Group might follow The First Mover Coalition's guidelines on "scalable and durable" carbon removal solutions (FMC, 2022b) could not identify any reference to this in Volvo's sustainability reporting. Similarly, the reporting provides no detailed information on the company's renewable electricity procurement, despite emphasising the need for increased sourcing of renewable energy beyond the 48% achieved in 2022 (Volvo Group, 2023a, pp. 155–156).

6 Electric utilities

6.1 Sector highlights

- **Electric utilities' emissions are primarily derived from electricity generation, sales of fossil gas and the upstream fuel chain** (which includes the resale of purchased electricity and the extraction, transport, and processing of fuels). The complete phase-out of fossil fuels and a rapid shift to renewables are the two main levers for electric utilities to decarbonise.
- **Likely driven by regulations, European companies generally demonstrate higher ambition than Duke Energy and KEPCO.** This is likely driven by legal compliance and more stringent regulations adopted in the EU, especially the EU emissions trading scheme. Duke Energy and KEPCO's targets fall short of global benchmarks, with a delayed phase-out of coal and fossil gas, and inadequate renewable energy targets. None of the five electric utilities present a comprehensive strategy for fossil gas phase-out.
- **Despite mostly operating in advanced economies, none of the assessed companies have committed to achieving net-zero emissions by 2035.** Both Iberdrola and Enel aim to reach (net) zero emissions by 2040, while ENGIE aims to reach net zero by 2045, and Duke Energy and KEPCO by 2050. All assessed companies would need to target net zero by 2035 to align their pledges with sectoral and regional benchmarks (IEA, 2023c, p. 79).
- **Several electric utilities pursue controversial solutions.** CC(U)S, bioenergy, and advanced nuclear technologies can distract electric utilities from investing in renewable generation and supporting electrification in end-use sectors.
- **Two of the five electric utilities do not clarify to what extent they will rely on offsetting to achieve their net-zero targets, while the other three provide limited details on how they will neutralise remaining emissions by their net-zero target year.** Duke Energy and KEPCO do not provide an emission reduction commitment alongside their net-zero pledge at all. Enel, Iberdrola, and ENGIE commit to reduce emissions across their value chain by 98%, 90% and, 84%, respectively. However, they provide limited details on the type of CDR they will use to neutralise their remaining emissions. None of the companies discloses information on climate contributions beyond the value chain.

Table 18 provides a summary overview of our (transparency) and integrity ratings for Iberdrola, Enel, ENGIE, Duke Energy, and KEPCO.

Table 18: Overview of integrity ratings for electric utilities.

COMPANY	HEADLINE PLEDGE	INTEGRITY	*Tracking & disclosure of emissions*	*Target setting*	*Emission reduction measures*	*Climate contributions & offsetting*	PAGE
Iberdrola	Net-zero emissions before 2040	◕	●	◕	◕	○	p. 96
Enel	Zero emissions in 2040	◕	●	◕	◕	◔	p. 92
ENGIE	Net-zero carbon by 2045	◔	●	◔	◔	○	p. 94
Duke Energy	Net-zero carbon by 2050	◔	◐	○	◔	○	p. 90
KEPCO	Carbon neutrality by 2050	○	◔	○	○	○	p. 98

6.2 Sectoral transition framework

Approximately three-quarters of global emissions are linked to energy, with 40% of this attributed to electricity and heat generation. Currently, the power sector is dominated by fossil fuels, with coal alone accounting for nearly 40% of global electricity generation (Ritchie and Rosado, 2020; Climate Watch and World Resources Institute, 2022). In order for other sectors to fully decarbonise, it is necessary that the power sector switches to renewable generation within the next two decades, and earlier in advanced economies. Electricity's share of final energy consumption is anticipated to surge from 20% today to over 50% by 2050 (IEA, 2023c, p. 79). End-use sectors, like transport, buildings, and certain industries like textiles and food, are expected to electrify in their efforts to decarbonise. Furthermore, electricity paves the way for decarbonisation in sectors that are difficult to electrify, like chemicals, steel, and aviation, by facilitating the production of green hydrogen (Henderson *et al.*, 2020, p. 14; IRENA, 2023a, p. 16).

Aligning with the 1.5°C pathway requires a steep and immediate reduction in *both* absolute emissions and carbon intensity. According to the IEA Net Zero Report, aligning the energy sector with a 1.5°C-compatible pathway requires a 44% emissions reduction globally in 2030 compared to 2021(IEA, 2023c, p. 79). Correspondingly, the global power sector will have to reduce its emission intensity to 48-186 gCO_2/kWh by 2030, and 0-23 gCO_2/kWh by 2040 (Dietz, Gardiner, *et al.*, 2021, p. 7; Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 20; IEA, 2023c, p. 199). This can be achieved by increasing the share of low-carbon energy sources, particularly renewables, and phasing out carbon-intensive fossil fuels (IPCC, 2022, p. 8). Under the 1.5°C-compatible trajectory, the electricity sector is required to be the first to achieve net zero — by 2035 for advanced economies, by 2040 for China, and by 2045 for the rest of the world (IEA, 2023c, p. 79). By 2050, it is anticipated that the electric utilities will not only have zero carbon emissions but also employ negative emissions technologies to achieve a state of negative carbon intensity (Dietz, Gardiner, *et al.*, 2021, p. 7; Boehm *et al.*, 2023, p. 29; IEA, 2023c, p. 199).

Decarbonising the power sector is not only technically feasible, but also economically viable and environmentally beneficial. In many countries, renewable energy has become the most cost-effective option for generating power due to its declining costs, which have fallen below the fossil fuel cost range (Boehm *et al.*, 2023, p. 33; IRENA, 2023b, p. 36). Over the past decade, the weighted average levelized cost of electricity (LCOE) for solar PV have dropped by 80%, onshore wind by 65%, and offshore wind by 54%. Additionally, the cost of short-duration energy storage is also falling rapidly, reaching around 89% between 2010 and 2021, and is expected to decrease even further (Ladislaw and Naimoli, 2020, p. 2; BloombergNEF, 2022; Boehm *et al.*, 2023, p. 33; Cole and Karmakar, 2023, p. 4). As a sector with the most advanced and readily available technological options for mitigation, electric utilities need not continue relying on fossil fuel-based generation systems in the medium and long term, which entail expensive social and environmental externalities (CAT, 2016, p. 7; IRENA, 2016, p. 7).

Electric utilities' climate strategies ought to avoid *false* technological solutions on the path to climate neutrality. Such solutions include the use of bioenergy, the use of CC(U)S, and the transfer (or sale) of polluting infrastructure to other companies. Bioenergy production is associated with a range of sustainability issues, including deforestation, biodiversity loss, uncertain GHG emissions reductions, and food insecurity *(see Section 3.3 of this report and Section 3 of the methodology document)*. The scarcity of sustainable bioenergy resources means that they should only be used in sectors where there are limited alternatives, which is not the case for the electricity utility sector (ETC, 2021, p. 62). Regarding CC(U)S, benchmarks indicate that this technology can only have a very minimal role in a decarbonised power sector, and only for gas power plants (CAT, 2023b, p. 10). CC(U)S extend the lifetime of fossil fuel and is a distraction from investing in true solutions. In addition, CC(U)S is faced with high challenges such as a high energy demand, imperfect capture rates, scarcity of storage potential, and very high costs compared to the costs of renewables and energy storage.

Key actions and measures for electric utilities

Measures to address electricity generation and its associated emissions along the value chain (scope 1 and/or upstream scope 3)

The primary source of emissions for electric utilities typically stem from electricity generation and its associated emissions along the value chain. Depending on the company's structure and business model, these emissions can be categorised under either scope 1 or upstream scope 3 (category 3). Collectively, these sources typically account for more than three quarters of the emissions profile of electric utilities.

Phase out of coal, oil, and gas for electricity and heat generation

Critical transitional measure

Phasing out fossil fuels represents the most important measure for decarbonising electricity to prevent investing in assets that will become stranded and locking in emissions that will derail us from staying in a 1.5°C trajectory (IEA, 2023c). Achieving this measure requires electric utilities to comply with the following milestones:

Global

- All (unabated) coal-fired power plants must be phased out globally by 2040 (Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 1; IEA, 2023c, p. 92).
- All large oil-fired power plants must be fully phased out globally by 2040 (IEA, 2023c, p. 92).
- All unabated fossil gas-fired power plants must be phased out globally by 2040, with a minimal role for CC(U)S (CAT, 2023b, p. 1). Fossil gas should constitute less than 5% of electricity generation by 2040, reducing further to 0-1% by 2050 (Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 12; IEA, 2023c, p. 92).

Advanced economies

- All unabated coal-fired power plants must be phased out in advanced economies by 2030 (CAT, 2023b, p. 1; IEA, 2023c, p. 92).
- All unabated fossil gas-fired power plants must be phased out in advanced economies by 2035, with a minimal role for CC(U)S (CAT, 2023b, p. 1).

Scale up renewables rapidly

Critical transitional measure

The acceleration of renewable energy adoption is the second key pillar in achieving steep reduction in carbon intensity, with a decarbonisation pathway that may vary based on regional differences (for detailed figures on the share of renewables in electricity generation milestones for certain countries, see CAT (2023b, p. 16). To align with a 1.5°C trajectory, electric utilities must ensure for operations that meet these benchmarks:

- Renewables should constitute between 59–89% in global electricity *generation* by 2030, 85–97% by 2040, and 89–100% by 2050 (IEA, 2022b, p. 138, 2023c, p. 197; Teske, 2022, p. 296; Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 16; IRENA, 2023c, pp. 22, 75). Variable renewable (wind and solar) will comprise between 40–78% in global electricity generation by 2030, 66–91% by 2040, and 70–96% by 2050 (IEA, 2022b, p. 138, 2023c, p. 197; Teske, 2022, p. 296; Boehm *et al.*, 2023, p. 29; IRENA, 2023c, pp. 22, 75).
- Renewables need to account for 68–77% of total *installed capacity* by 2030 and 82–94% by 2050, with higher shares in advanced economies (IEA, 2023c, p. 197; IRENA, 2023c, pp. 22, 75). Annual addition of variable renewable (wind and solar) capacity should reach approximately 1,100 GW by 2030, almost four times greater than the capacity added in 2022 (around 300 GW) (IEA, 2022b, p. 138, 2023c, p. 197; IRENA, 2023c, pp. 22, 75). China, the EU, and the United States are expected to account for 75% of this annual capacity addition.

Improve power system reliability and flexibility Enabling measure

Improving grid reliability and flexibility is a prerequisite to allow higher penetration of renewables, given the variable nature of wind and solar energy, alongside the increasing demands of electrification, which reshapes load curves and boosts demand variability (IEA, 2022b, pp. 214–216; Jafari *et al.*, 2022). According to IEA (IEA, 2023a, pp. 7-9,27,42-44,51,90,102-105, 2023c, p. 80) and IRENA (2023c, p. 152), grid expansion and improvement is crucial to effectively integrate an increasing amount of renewable sources while ensuring supply security and enhancing resilience against extreme weather events. Currently, over 3,000 GW of renewable power projects, half of which are in advanced stages, are awaiting grid connection. This backlog highlights the risk of the grid becoming a significant bottleneck in the energy transition. In addition, the process of developing new grid infrastructure can take up to 15 years, from planning to commissioning, in contrast to an average of 5 years for renewable projects. In advanced economies such as the EU, the US, and South Korea, delays in grid development could lead to increased reliance on fossil gas beyond 2030, potentially making energy less affordable and more susceptible to price volatility due to dependence on coal and fossil gas. This underscores the urgency for electric utilities, especially those owning transmission and distribution operations, to invest significantly in grid expansion and improvement in the short-term, in line with the scale required to meet these benchmarks:

- Grid investments are expected to double by 2030, rising from around USD 300 billion in 2022 to USD 680 billion, with a focus on digitalisation and modernisation of distribution systems (IEA, 2023e, p. 49, 2023c, pp. 80, 107, 146). By 2030, transmission and distribution grids will need to expand by 2 million kilometres annually to reach approximately 90 million kilometres in total.
- As battery storage emerges as an important option for grid flexibility in systems with a high share of variable renewables, it is anticipated that global utility-scale battery capacity will reach approximately 1,000 GW by 2030 and could exceed 4,000 GW by 2050 (IEA, 2022b, pp. 215–216, 2023c, pp. 83, 197).

Measures to address emissions from the sale of fossil gas (downstream scope 3)

Depending on the business model, another significant source of emissions for electric utility companies typically stems from the sale of fossil gas. This is categorised under downstream scope 3 (category 11). In line with the previous measures, electric utilities should actively facilitate the switch from fossil fuels to cleaner energy alternatives for the end-use sectors. This not only supports the broader industry transition but also directly addresses the primary emissions sources, which predominantly arise from fossil-based electricity generation and sales of fossil gas.

Support electrification and alternatives in other sectors Enabling measure

Transitioning from fossil fuels to electricity and lower-carbon fuel alternatives like green hydrogen in end-use sectors is one of the identified measures to align with the 1.5° pathway (IPCC, 2022, p. 29). Deep electrification of end-use sectors has the potential to cut emissions by 20–25% in buildings, 50–60% in transport, and 15–20% in industries (IRENA, 2019, pp. 6–7; Nadel, 2019). This is especially evident in applications such as heat pumps, electric light-duty vehicles, and low-to-medium temperature industrial processes. Complementarily, green hydrogen serves as a solution to overcome the limits of electrification to decarbonise the sectors that are difficult to electrify, such as chemicals, shipping, aviation, and high-temperature applications in the iron and steel industry (The Hydrogen Council and McKinsey & Company, 2021, pp. 13–17; Lorentz *et al.*, 2023, p. 9). The role of electric utilities can be pivotal in this transition, taking the lead in infrastructure investments and promoting partnerships, such as by scaling up green hydrogen production facilities, investing in EV charging infrastructure, or promoting the adoption of heat pumps for customers, which contributes to meet the following Paris-aligned benchmarks:

- Investments in clean hydrogen (mostly green hydrogen) and its derivatives infrastructure currently stand at approximately USD 1 billion annually in 2022 and need to increase to USD 100–150 billion annually by 2030 and USD 170 billion annually by 2050 (IEA, 2023c, p. 141; IRENA, 2023c, p. 23).
- Electrolyser capacity needs to be scaled up from 0.5 GW in 2022 to 428 GW by 2030 and 5,722 GW by 2050 (IRENA, 2023c, p. 23).
- Annual green hydrogen production must be ramped up from 0.03 million tonne in 2021, to 58 million tonne by 2030 and 330 million tonne by 2050 (Boehm *et al.*, 2023, p. 61).
- Investments for EV charging infrastructure and adoption support currently stand at USD 30 billion per year in 2022, and need to reach USD 137 billion per year by 2030 and USD 364 billion per year by 2050 (IRENA, 2023c, p. 23).
- Investments in heat pumps, presently at USD 64 billion per year in 2022, needs to rise to USD 237 billion per year by 2030 and USD 230 billion per year by 2050 (IRENA, 2023c, p. 23).

6.2 Duke Energy

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Electric Utilities	USD 28.8 bn (2022)	116.3 $MtCO_2e$ (2022)	Net zero carbon emissions by 2050	Moderate	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

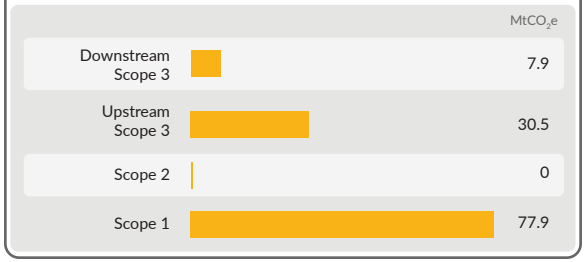
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 116.3 $MtCO_2e$ in 2022

Major emission sources: Direct emissions from electricity generation (67%)

Disclosure: All emission sources disclosed, but access is restricted for audiences outside the US

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and closure.



2 SETTING EMISSION REDUCTION TARGETS

	TRANSPARENCY	INTEGRITY
Headline target or pledge		
Net zero carbon emissions by 2050		
Short-term targets (up to 2030)	◐	◌
• *Reduce carbon emissions from electricity generation by at least 50% below 2005 levels by 2030*		
• *Net zero methane emissions from natural gas distribution business (scope 1) by 2030*		
Scope coverage: S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019): **14%** by 2030		
Limited reduction in emissions across the value chain compared to 2019 levels		
Medium-term targets (2031 - 2040)	◔	◔
• *Reduce scope 1 CO2 emissions from electricity generation by 80% below 2005 levels by 2040*		
• *Reduce scope 2 and certain scope 3 emissions by 50% by 2035 from 2021 levels*		
Scope coverage: S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019): **39%** by 2040		
Falls well short of 1.5°C compatible trajectories or benchmarks for the sector		
Longer-term targets (2040 - onward)	◔	◌
Net-zero emissions by 2050 from electricity generation and natural gas businesses, including scopes 1 and 2 and certain scope 3 emissions		
Scope coverage: S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019): **?**		
No specific commitment to emission reductions alongside net zero terminology		

3 REDUCING OWN EMISSIONS

		TRANSPARENCY	INTEGRITY
Operational emissions (scope 1) — 67% of 2022 emissions	Coal phaseout by 2035, delayed gas transition by 2050, and insufficient renewable targets lag behind global benchmarks for advanced economies and risk future stranded assets	◔	◔
Renewable electricity (scope 2) — 0% of 2022 emissions	*Not assessed.*	N/A	N/A
Upstream emissions (scope 3) — 26% of 2022 emissions	Coal phaseout by 2035, delayed gas transition by 2050, and insufficient renewable targets lag behind global benchmarks for advanced economies and risk future stranded assets	◔	◔
Downstream emissions (scope 3) — 7% of 2022 emissions	Shifting to waste-based RNG as a replacement for fossil gas to cut scope 3 downstream emissions is considered as a false solution	◔	◔

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

	TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation): *No climate contributions identified.*	◌	◌
Misleading offseting claims today: *No offsetting claim identified.*	N/A	N/A
Approach to residual emissions: No details on the amount of emissions that the company will claim to neutralise by 2050.	◌	?

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ◌ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Duke Energy (2022, 2023a, 2023b)*

Duke Energy

Duke Energy Corporation, headquartered in the United States, is a major energy holding company operating in six federal states. It specialises in the generation, transmission, and distribution of electricity, as well as the storage, transmission, and distribution of fossil gas. In 2022, two-thirds of its emissions originated from electricity generation, while a quarter comes from the upstream fuel chain, which includes the resale of purchased electricity and the extraction, transport, and processing of fuels. Over 60% of the company's electricity generation capacity derived from coal and fossil gas in 2022. Duke Energy committed to achieving net-zero emissions by 2050 and set short- and medium-term goals. However, insufficient renewable energy targets, a delayed coal phase-out, and the risk of over-reliance on fossil gas undermine these climate targets. Duke's climate strategy falls short of decarbonisation milestones for electric utilities needed to align with the Paris Agreement's 1.5°C global warming limit.

Duke Energy's emission reduction target for 2030 is insufficient to contribute to the deep emission reductions required for the power sector by that year. The company aims to reduce its scope 1 emissions by at least 50% below 2005 levels by 2030 (Duke Energy, 2023b, p. 17, 2023a, p. 65), which translates to only a 14% reduction below 2019 levels. Not only is this short-term target insufficient, but Duke Energy had already managed to reduce its scope 1 emissions by 44% below 2005 levels in 2022, indicating that the company needs to undertake only minimal additional efforts to reach its 2030 target of 50% reduction in scope 1 emissions (Duke Energy, 2023b, p. 16). As part of this 50% reduction commitment, Duke Energy pledged to achieve net-zero methane emissions from natural gas distribution (scope 1). However, the energy utility provides no further details on this commitment, including the expected role of offsetting versus own emission reductions.

Duke Energy's commitment to achieving net-zero emissions by 2050 does not meet the timelines required for electric utilities in advanced economies, which need to reach net zero by 2035 (IEA, 2023c). As milestones on the pathway to net zero, Duke Energy commits to reducing its scope 2 and selected scope 3 emissions by 50% below 2021 levels by 2035, and to reducing its scope 1 carbon emissions by 80% below 2005 levels by 2040 (Duke Energy, 2023a, p. 65). Neither these interim targets nor the 2050 net-zero pledge meet sectoral and regional benchmarks, which require power utilities in the United States to achieve net zero between 2035 and 2040 (CAT, 2023b, p. 1; IEA, 2023c, p. 62). While Duke specifies that it will offset part of its emissions to get to net-zero emissions, the company provides no details on the amount of emissions it plans to offset or the type of offsetting projects it plans to pursue (Duke Energy, 2023a, p. 53). Moreover, Duke Energy's publications frequently underscore that achieving its climate targets hinges on external factors, such as regulatory approvals, enabling policies, and technology advancements (Duke Energy, 2023a, p. 48,52,71). This emphasis indicates a potentially passive approach to accelerating climate action, despite the company's significant role in the energy sector.

Duke Energy's approach to phasing out coal-fired and gas-fired electricity generation does not align with the 1.5°C-compatible benchmarks for the sector, and creates risks of increased reliance on fossil gas and related stranded assets. Duke Energy plans to reduce its coal generation to 5% of the mix by 2030 and to phase out coal completely by 2035, but with the caveat that these targets are subject to regulatory approvals (Duke Energy, 2023a, p. 29). This timeline lags behind the 1.5 °C-compatible phase-out timeline of 2030 for advanced economies (CAT, 2023b, p. 1; IEA, 2023c, p. 62). Despite its emissions reduction commitment, Duke Energy does not plan to halt fossil gas-fired power plant construction after 2030, but instead relies on anticipated hydrogen capabilities and hydrogen blending in gas turbines (Duke Energy, 2022, p. 18,67, 2023a, p. 43), which could potentially lead to stranded assets in the future. Duke Energy is in the process of converting about one-third of its coal units to run fully or partially on fossil gas, with certain units expected to run fully on fossil gas beyond the designated coal plant phase-out year (Duke Energy, 2022, p. 60). The company only sets a goal to phase out its gas-powered generation portfolio by 2050 (Duke Energy, 2023a, pp. 48–49), which is 15 years beyond the advised timeline for developed countries (CAT, 2023b, p. 1).

Instead of rapidly increasing the share of renewable energy deployment, Duke Energy plans to incorporate false solutions like CCUS and biogas. In 2022, renewable energy accounted for only 8% of Duke Energy's total electricity generation (Duke Energy, 2023b, p. 22). The company's renewable targets in its generation mix — 18% by 2030, 35% by 2040, and 40% by 2050 — fall far short of 1.5 °C-compatible sectoral benchmarks in the United States, which suggest a renewable mix of 68%–86% by 2030, 85%–95% by 2035, 93%–97% by 2040, and 99%–100% by 2050 (Duke Energy, 2022, p. 18, 2023b, p. 22, 2023a, p. 20; CAT, 2023b, p. 16). At the same time, the company considers resorting to CCUS for its coal-fired power plants and combined cycle power plants (Duke Energy, 2023a, p. 37,44). Reliance on CCUS in electricity generation faces severe risks due to the unproven efficacy of these technologies and their potential environmental impacts. Duke Energy also regards renewable natural gas (RNG) from waste-based feedstocks as a 'carbon neutral' fuel (Duke Energy, 2023b, p. 31), potentially overlooking the fuel's negative sustainability implications while diverting attention from the need to invest in real solutions (Saadat *et al.*, 2020). The investment in RNG might prolong the use of fossil gas infrastructure rather than representing a genuine pivot towards more sustainable alternatives, such as renewables-based electrification.

6.3 Enel

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Electric Utilities	USD 147.8 bn (2022)	134.9 $MtCO_2e$ (2022)	Zero emissions in 2040	Reasonable	Reasonable

1 TRACKING AND DISCLOSURE OF EMISSIONS

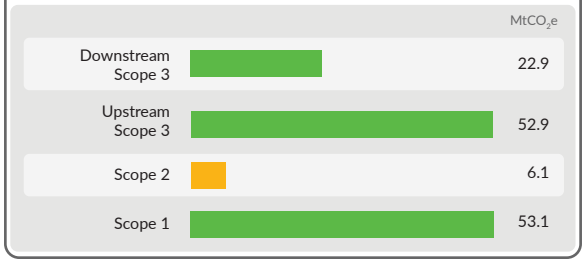
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 134.9 $MtCO_2e$ in 2022

Major emission sources: Energy production (scope 1, 29%), sales of gas (scope 3, 17%), upstream fuel chain incl. electricity purchased (scope 3, 29%).

Disclosure: Major emission sources are disclosed transparently.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and closure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	*Zero emissions in 2040*		
Short-term targets (up to 2030)	*68% GHG absolute reduction in all 3 scopes; 78% for integrated power (scope 1 and 3); 55% reduction in GHG scope 3 emissions relating to gas retail (all vs 2017)*		
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	59% by 2030		
Intensity targets are at the lower end of the range of the benchmarks for the sector but should be reduced even further to meet European benchmarks.			
Medium-term targets (2031 - 2040)	*Net zero in 2040; emissions intensity of electricty generation and gas sales reach 0.*		
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	98% by 2040		
Enel aims at reaching Zero Emissions until 2040. Depending on available technologies, it might have 2.5 Mt CO_2eq. residual emissions.			
Longer-term targets (2041 - onward)	*Not relevant*	N/A	N/A
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
Not relevant			

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	39% of 2022 emissions	Enel commits to phase-out coal (2027) and gas (2040) and invests in renewables, but the pace is not quite sufficient to fully align with EU benchmarks.		
Renewable electricity (scope 2)	3% of 2022 emissions	*Not assessed.*	N/A	N/A
Upstream emissions (scope 3)	39% of 2022 emissions	Mitigation strategies apply also to electricity purchased and sold to end customers, but the pace is not quite sufficient to fully align with EU benchmarks.		
Downstream emissions (scope 3)	17% of 2022 emissions	The company's strategy focuses on replacing fossil gas through electrification of its customers' energy demand. No investments in bioenergy are made.		

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*		
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	Objective is to reach real zero, but depending on technologies. Enel foresees residual emissions of up to 2.5Mt in 2040, without a specific plan for CDR options.		

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Enel (2023a, 2023b)*

Enel

Enel is an international energy based in Italy. Most of the company's emissions originate from electricity production and heat (39%), sales of gas (17%), and the upstream fuel chain (29%), which includes the purchase of electricity and the extraction and transport of coal and gas. The company aims to achieve net-zero emissions in 2040. This commitment translates to a 98% reduction of all emissions below 2019 levels. Enel commits to phasing out coal by 2027 and gas by 2040. The company's strategy lays the groundwork for a new business model focused on renewable energy generation and the electrification of customers in the building and mobility sectors. Overall, Enel's climate strategy is mostly aligned with the 1.5° pathway for the power sector for both 2030 and 2040.

Enel's 2030 intensity targets represent a step in the right direction but should be enhanced to meet decarbonisation benchmarks for Europe. The company commits to reducing the carbon intensity of power generation (scope 1) to 72 gCO_2e/kWh and integrated power (from both own electricity generation and electricity purchased) to 73 gCO_2e/kWh power by 2030 (Enel, 2023a, pp. 88–89). While these targets fall within the lower end of global benchmarks for the power sector (Dietz, Gardiner, *et al.*, 2021, p. 7; CAT, 2023b, p. 20; IEA, 2023c, p. 199; Jaeger *et al.*, 2023, p. 11), they do not meet the carbon intensity benchmarks set for the EU (CAT, 2023b, p. 19). Further, Enel commits to reduce absolute emissions across the value chain by 59% between 2019 and 2030, which would be in line with the 1.5°C-compatible trajectories for the sector at the global level. However, steeper reductions would be needed in the EU, where Enel generates the majority of its revenues.

Enel's pledge to aim for deep decarbonisation by 2040 falls slightly short of the timelines required for electric utilities in advanced economies, which need to reach net zero by 2035 (IEA, 2023c, p. 79). Enel commits to net-zero emissions by 2040 (Enel, 2023b, p. 24), which translates to a reduction of 98% below 2019 levels *(see integrity assessment in Annex II)*. Although Enel's 2040 intensity targets of 0 gCO_2e/kWh for power generation and integrated power align with the global benchmarks, electric utilities in Europe should reach these intensity levels already in the 2030s (CAT, 2023b, p. 20). According to the IEA (IEA, 2023c, p. 79), the power sector in advanced economies should reach net zero by 2035.

Enel commits to fully phasing out coal by 2027 and gas by 2040, meeting global and regional benchmarks. Enel's commitment on coal extends to scope 1 (its own generation) as well as scope 3 upstream (purchased electricity) emissions. The company also plans to exit from gas-fired generation and retail gas sales by 2040. These commitments are in line with the IEA's recommendation for advanced economies to phase out coal by 2030 and to limit the share of unabated gas in electricity generation to 5% by 2040 (IEA, 2023c, p. 92).

Enel's strategy emphasises on renewables and electrification. Enel is investing heavily in renewable energy, aiming to reach an 85% share of renewables in total installed capacities by 2030 and achieve full reliance on renewables by 2040. This target surpasses the 1.5°C-compatible benchmarks for the sector, which recommends a 68% share of renewable energy in total installed capacity by 2030 to limit global warming to 1.5°C (IEA, 2023c, p. 197). In parallel, Enel is focusing on electrifying sectors that currently rely on liquid fossil fuels. It is expanding its charging network to promote e-mobility and supporting the installation of heat pumps for domestic heating and induction cooktops in kitchens to facilitate the transition in the building sector. The company refrains from investing in potentially false solutions such as bioenergy and CC(U)S.

6.4 ENGIE

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Electric Utilities	USD 98.7 bn (2022)	174.3 $MtCO_2e$ (2022)	Net zero carbon by 2045	Moderate	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

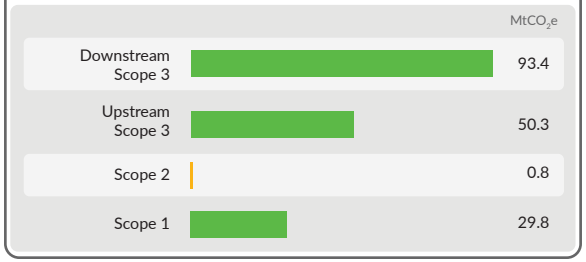
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 174.3 $MtCO_2e$ in 2022

Major emission sources: Energy production (scope 1, 36%), sales of gas (scope 3, 35%), upstream fuel chain incl. resale of electricity purchased (scope 3, 24%).

Disclosure: Major emission sources are disclosed transparently.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and closure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	***Net zero carbon by 2045***		
Short-term targets (up to 2030)	*Reduce carbon intensity of direct energy production (scope 1) to 110g CO2/kWh in 2030 and reduce carbon intensity of energy sales procured (scope 1 and 3) to 152g CO2/kWh in 2030*	◐	◔
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	24% by 2030		
	A range of objectives have been set but 2030 targets are not aligned with 1.5°C compatible decarbonisation benchmarks for the sector.		
Medium-term targets (2031 - 2040)	*No targets for the 2031-2040 timeframe identified.*	○	○
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
	ENGIE has not set medium-term targets.		
Longer-term targets (2041 - onward)	*Net zero carbon by 2045*	◔	◔
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	86% by 2045		
	The GHG target of at least -90% (2017 baseline) represents a 86% reduction compared to 2019 and is not in line with 1.5°.		

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	17% of 2022 emissions	Plans to phase-out coal but not gas power plants. Renewable ramp-up is insufficient. The company invests in potentially false solutions such as gas CCS.	◐	◐
Renewable electricity (scope 2)	0% of 2022 emissions	*Not assessed.*	N/A	N/A
Upstream emissions (scope 3)	29% of 2022 emissions	It is unclear whether ENGIE plans to reduce the GHG intensity of electricity purchased.	◔	○
Downstream emissions (scope 3)	54% of 2022 emissions	The strategy is centered around the role of (decarbonised) gas in the energy mix and there is not clear support for large-scale electrification.	◐	◔

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	○	○
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	Plans to neutralise up to 14% of emissions (based on 2019 levels) in 2045. This volume goes beyond definitions of residual emissions for the sector.	◐	○

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ○ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *ENGIE (2023)*

ENGIE

ENGIE is an international energy utility based in France. Most of the company's emissions originate from energy production (electricity, heating, and cooling) (36%), sales of gas (35%), and upstream fuel chain (24%), mostly involving the resale of purchased electricity and the extraction and transport of raw materials. ENGIE aims to achieve net-zero emissions by 2045, which is defined as a 90% GHG reduction compared to 2017 levels. Gas will continue to play a role in the company's operations even after reaching its net-zero target in 2045. ENGIE commits to a coal phase-out by 2027, although it is unclear whether this also covers electricity purchased for retail and shares in power plants it does not control. Overall, ENGIE's climate strategy for 2030 and 2045 does not align with the 1.5° pathway for the power sector, which poses a risk of delaying decarbonisation in other sectors.

ENGIE presents various absolute and intensity reduction targets, but for some targets we could not identify the emission sources they cover. For instance, it is unclear what ENGIE means by its target to reduce "other GHG emissions, including scope 3 from procurement, capital goods and the upstream of purchased fuels and electricity" to 85 $MtCO_2e$ (ENGIE, 2023, p. 16). ENGIE does not specify what other emission sources are covered by this target. As a result, it is not possible to aggregate ENGIE's various targets and understand the emission reductions across the value chain the company commits to. Based on our own analysis, we estimate that the various targets translate to a reduction of at least 24% by 2030, compared to 2019 levels *(see integrity assessment in Annex II)*.

ENGIE's short- and long-term climate targets are incompatible with the 1.5°C pathway for the sector. Aligning the energy sector with the 1.5°C-compatible pathway requires a steep and immediate reduction in carbon intensity and emissions over this decade. The net-zero emissions target by 2045 allows high volumes of residual emissions (14% of 2019 levels), with unspecified use of carbon sinks to neutralise them (ENGIE, 2023, p. 68). ENGIE's intensity targets for 2030, set at 110g CO_2e per kWh for energy production (i.e. electricity, heating and cooling in scope 1) and energy consumption (scope 2), as well as 153g CO_2e per kWh for energy sales produced (scopes 1 and 3) and purchased (scope 3), are at the upper end of the carbon intensity range recommended in existing literature (Dietz, Gardiner, *et al.*, 2021, p. 7; CAT, 2023b, p. 20; IEA, 2023c, p. 199; Jaeger *et al.*, 2023, p. 11). In terms of absolute targets, ENGIE's target of reducing emissions by at least 24% between 2021 and 2030 (based on own calculations, see integrity assessment in Annex II) falls significantly short of the sector benchmark, which aims for a 44% reduction in the power sector globally (IEA, 2023, p. 62), and would postpone most of the necessary reductions beyond 2030. Additionally, the company has not set any interim targets between 2030 and its long-term target in 2045.

There is some ambiguity surrounding ENGIE's commitment to phase out coal, and the company does not plan to end gas use in its power plants fleet. The company has set a coal phase-out goal by 2027 (ENGIE, 2023, p. 68), but it is unclear whether this commitment only refers to ENGIE's own power plants or also covers electricity purchased for resale and ENGIE's share in power plants it does not control. In addition, ENGIE does not commit to significantly decommission its gas power plants by 2030, which would be necessary to get on track for eventually phasing out gas. The company insists on the role of gas as a suitable flexibility option in the decarbonisation of the energy sector and supports the use of CCS to extend the life of gas power plants (ENGIE, 2023, p. 66).

The pace of transitioning to alternatives appears too slow and relies on flawed assumptions. ENGIE is scaling up renewable energy capacity, with a focus on wind and solar in its strategy. The goal is to reach a 58% of renewables capacity in its energy mix by 2030. However, global benchmarks for the sector indicate that a 68% share of renewable energy in total installed capacity is necessary by 2030 to stay below the Paris Agreement's warming limit of 1.5°C (IEA, 2023c, p. 193). Regarding gas sales, ENGIE commits to achieving 100% decarbonised gas by 2045, but its strategy relies on potentially false solutions such as large amounts of biomethane and the use of green hydrogen in sectors where more energy-efficient alternatives exist. Overall, the company's sustainability report indicates that it does not support the vision of large-scale electrification but sees the role of (decarbonised) gas as crucial in the transformation.

6.5 Iberdrola

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Electric Utilities	USD 56.7 bn (2022)	55.8 $MtCO_2e$ (2022)	Net zero emissions before 2040	Reasonable	Reasonable

1 TRACKING AND DISCLOSURE OF EMISSIONS

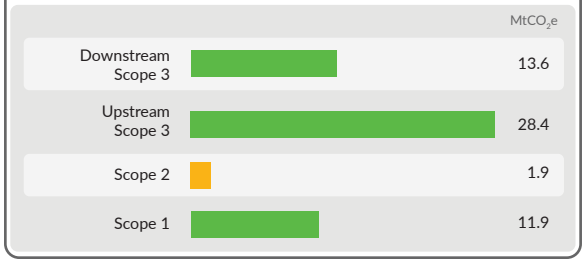
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 55.8 $MtCO_2e$ in 2022

Major emission sources: Three quarters of emissions originate from upstream fuel chain (incl. purchased electricity) and sales of fossil gas.

Disclosure: Detailed disclosures of emissions in all operating countries.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and closure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	***Net zero emissions before 2040***		
Short-term targets (up to 2030)	*Carbon neutrality in scope 1 and 2 emissions, a reduction of absolute scope 1, 2 and 3 GHG emissions 65% by 2030 and absolute scope 1, 2 and 3 emissions 20% by 2026, both from a 2020 base year*	◐	◕
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	64% by 2030		
	Potentially misleading carbon neutrality target, but targeted emission reductions are 1.5°C-compatible		
Medium-term targets (2031 - 2040)	*A reduction of scope 1, 2 and 3 emissions 90% by 2039 from a 2020 base year*	◕	◐
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	90% by 2040		
	Most relevant emissions scopes are covered but net zero target misses the benchmark for advanced economies		
Longer-term targets (2041 - onward)	*No targets identified.*	N/A	N/A
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
	No target identified.		

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	20% of 2022 emissions	Iberdrola has completely phased out coal in 2020. It has an ambitious renewable deployment target by 2030. No investments made in CCUS	◕	◕
Renewable electricity (scope 2)	3% of 2022 emissions	*Not assessed.*	N/A	N/A
Upstream emissions (scope 3)	52% of 2022 emissions	Iberdrola has completely phased out coal in 2020, yet fossil gas-fired power plants will be sold instead of decommissioned	◕	◕
Downstream emissions (scope 3)	24% of 2022 emissions	Comprehensive strategy to end its fossil gas sales is missing, but it supports decarbonising other sectors through green hydrogen and electrification	◔	◐

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	○	○
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	Plans to claim neutralisation of up to 10% of emissions in 2040 (based on 2019 levels) with land sequestration CDR. This volume goes beyond definitions of residual emissions for the sector.	◕	○

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ○ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Iberdrola (2020, 2022, 2023a, 2023b, 2023c, 2023d, 2023e, 2023f, 2023g)*

Iberdrola

Iberdrola is a multinational energy utility headquartered in Spain. Around half of the company's emissions originate from the upstream fuel chain, which includes the resale of purchased electricity, and the extraction, transport, and processing of fuels, while a quarter comes from the sales of fossil gas. Iberdrola has set both short- and medium-term goals to achieve net-zero emissions across its entire value chain by 2039. The company shut down its last coal-powered plants in 2020 and focuses on scaling up its renewable energy capacity generation, alongside phasing in green hydrogen to support decarbonisation in other sectors. These targets and measures align Iberdrola's climate strategy mostly with a 1.5°-compatible trajectory. Despite these positive steps, a comprehensive plan to completely phase out fossil gas is still missing.

While Iberdrola aims for deep decarbonisation by 2039, the company would need to bring its net-zero commitment forward by four years to be fully aligned with 1.5°C-compatible benchmarks for electric utilities in advanced economies (IEA, 2023c, p. 79). Iberdrola committed to net zero across all emission scopes before 2040 (Iberdrola, 2023f, p. 1). Alongside this net-zero target, the company pledged to reduce its own emissions by 90% below 2020 levels (Iberdrola, 2023g). While the IEA suggests that the global energy sector should reach net zero by 2045, advanced economies should reach this milestone already ten years earlier (IEA, 2023c, p. 79). Given that Iberdrola mainly operates in the European Union, United Kingdom and the United States, the company would have to bring its net-zero target forward to 2035 to meet this regional benchmark. Iberdrola's interim target is to achieve carbon neutrality in scope 1 and 2 emissions by 2030 (Iberdrola, 2023a), equivalent to a 68% reduction across the value chain compared to 2021. While this level of emissions reduction would be in line with the 1.5°C-compatible trajectories for the sector by 2030, using the term 'carbon neutrality' can be misleading to consumers and investors, as 'carbon neutral' suggests that Iberdrola will be close to fully decarbonised *(see integrity assessment in Annex II)*.

Although Iberdrola has completed its coal phase-out, the company has not published a comprehensive fossil gas phase-out plan: the company neither commits to fully phasing out its fossil gas-fired power plants nor to ending its fossil gas sales. The company closed its last coal plant in 2020, well ahead of the 2030 deadlines for the phase-out of unabated coal in advanced economies (CAT, 2023b, p. 1; Iberdrola, 2023f, pp. 87–88; IEA, 2023c, p. 62). However, Iberdrola has not yet publicly announced a plan for completely phasing out its gas-fired power plants, which account for 15% of its own installed capacity and 24% of its own electricity generation (Iberdrola, 2023b, p. 101, 2023d, p. 19). The only action taken towards addressing its fossil gas assets is the planned sale of its gas-fired power plants in Mexico instead of complete decommissioning (Iberdrola, 2023h). This misses the benchmark for aligning with a 1.5°C pathway, which requires advanced economies to phase out unabated gas by 2035 and the rest of the world by 2040 (CAT, 2023b, p. 1).

Iberdrola invests a significant portion of its capital expenditure to increase renewable energy capacity. In 2022, Iberdrola's own installed renewable energy capacity accounted for 66% of its total installed capacity, while its own renewable energy generation accounted for 46% of its total generation (Iberdrola, 2023g). Iberdrola aims to significantly expand its renewable capacity from 40 GW in 2022 to 95 GW by 2030, which will constitute approximately 93% of its total installed capacity (Iberdrola, 2020, p. 6). This target shows that the company is on track to meet global 1.5 °C-compatible benchmarks, which recommend a 68%-77% share of renewable energy in total installed capacity and a 59%-89% share of renewable energy in generation mix by 2030 (Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 16; IEA, 2023c, p. 197; IRENA, 2023c, pp. 22, 75). Also in 2022, Iberdrola allocated 86% of its capital expenditure to activities that support the implementation of critical transitional and enabling measures identified for electric utilities *(see Section 7.2: Electric Utilities – Sectoral Transition Framework)*. Around half of this investment was directed toward solar PV, wind, and hydropower projects, with the remaining portion allocated to the grid (Iberdrola, 2023d, pp. 245–246). Iberdrola is also adopting green hydrogen and electrification technologies, including extensive electric vehicle charging infrastructure (Iberdrola, 2023f, p. 98).

Iberdrola's strategy for claiming the neutralisation of its residual emissions relies on ecosystem conservation and restoration, which is not a credible equivalent to reducing emissions. The company plans to achieve net zero by neutralising the remaining 10% of its 2020 emissions through land sequestration carbon dioxide removal (Iberdrola, 2023f, p. 111). Central to this plan is the *Carbon2Nature* venture owned by Iberdrola, which aims to plant 20 million trees by 2030, predominantly in Latin American countries. The company anticipates that this initiative will have a carbon capture and storage capacity of over 6 million tonne CO_2 over the next 30 years (Iberdrola, 2022, 2023e). Due to several environmental constraints and the non-permanent nature of these removals, this does not represent a credible equivalent to emissions reduction *(see Section 3.5 in this report and Section 4.1.3 in the Methodology document)*.

6.6 KEPCO

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Electric Utilities	USD 55.2 bn (2022)	462.4 $MtCO_2e$ (2021)	Carbon neutrality by 2050	Poor	Very poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

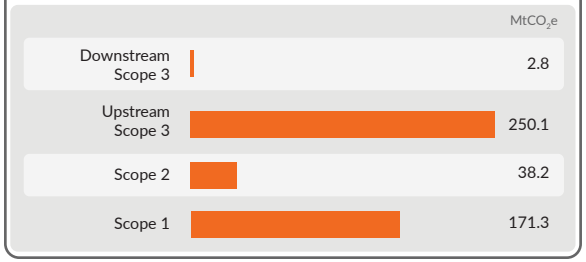
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 462.4 $MtCO_2e$ in 2021

Major emission sources: Approximately half of emissions are attributed to scope 3 upstream, particularly from power generation fuel combustion and production

Disclosure: KEPCO presents inconsistent figures for scope 1 & 2 emissions in 2022 sustainability report; scope 3 data is incomplete without explanation

Subsidiary coverage: Subsidiaries are only partially covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	*Carbon neutrality by 2050*		
Short-term targets (up to 2030)	*Reduce scope 1 and 2 by 47.4% below 2018 levels*	Moderate	Poor
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	18% by 2030		
Short-term target excludes scope 3 emissions and targeted emission reductions fall well short of 1.5°C-compatible benchmarks for the sector.			
Medium-term targets (2031 - 2040)	*No targets for the 2031-2040 timeframe identified.*	Very poor	Very poor
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
N/A			
Longer-term targets (2041 - onward)	*Carbon neutrality for its own operations (i.e. scopes 1 and 2) by 2050*	Very poor	Very poor
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	KEPCO does not specify what "carbon neutral" means and does not commit to own reductions for scope 3.		
Long-term target excludes scope 3 emissions and translates to a very limited reduction in emissions across the value chain.			

3 REDUCING OWN EMISSIONS

		TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	37% of 2021 emissions: Critically inadequate renewable targets, a delayed coal phaseout, a risk of fossil gas lock-in and use of false solution (CCUS)	Poor	Very poor
Renewable electricity (scope 2)	8% of 2021 emissions: *Not assessed.*	N/A	N/A
Upstream emissions (scope 3)	54% of 2021 emissions: Critically inadequate renewable targets, a delayed coal phaseout, and a risk of fossil gas lock-in	Poor	Very poor
Downstream emissions (scope 3)	1% of 2021 emissions: Implemented certain measures to decarbonise other sectors, from deploying EV charging points to scaling up green hydrogen	Poor	Poor

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	Very poor	Very poor
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	No details provided on the role and relevance of neutralisation in the carbon neutrality target	Very poor	?

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *KEPCO (2022, 2023)*

KEPCO

Korea Electric Power Corporation (KEPCO) is a major state-owned electric utility headquartered in South Korea. KEPCO accounts for almost 60% of the country's generation capacity and engages in overseas projects in 16 other countries, mainly in the Asia Pacific region. The majority of the company's emissions originate from the upstream fuel chain (54%), which includes the purchase of electricity and the extraction and transport of coal and fossil gas, followed by electricity generation of its group companies (37%). More than 60% of KEPCO's generation capacity is comprised of coal and fossil gas. KEPCO committed to carbon neutrality by 2050, but 1.5°C compatibility for the power sector in advanced economies requires net-zero emissions already by 2035. KEPCO's carbon neutrality target may be further undermined by inconsistent reporting, inadequate renewable targets, a delayed coal phaseout, and the risk of gas lock-in.

KEPCO's emission disclosure lacks consistency and transparency. The company's emissions data appears unclear and inconsistent, as KEPCO uses non-standardised units and categories across various emission scopes. In its 2022 sustainability report, KEPCO even presents differing figures for scope 1 and 2 emissions within the same document, both in the main section and the appendix (KEPCO, 2022, pp. 78-79,180-181). This inconsistency extends to the presentation of key milestones in KEPCO's strategic roadmap, making it difficult to assess essential metrics like carbon intensity, phaseout dates for fossil fuels, and generation and capacity mix. For instance, its overseas coal phaseout roadmap features varying years, showing one set of figures for 2022 and 2030, a different set of figures for 2030 and 2035, and another set for 2030 and 2050 (KEPCO, 2022, p. 59). Such inconsistency complicates the understanding of KEPCO's long-term plans and comparing them against established benchmarks.

KEPCO's interim and long-term goals for carbon neutrality not only fall short of aligning with a 1.5°C-compatible pathway, but the plans to achieve them remain vague, too. KEPCO pledged to achieve carbon neutrality by 2050, mirroring the South Korean government's goal. However, it does not meet the urgent timelines required for electric utilities in advanced economies, which should aim for net zero by 2035 (IEA, 2023c, p. 79). KEPCO's carbon neutrality target and its short-term target for 2030 exclude scope 3 emissions, which is equivalent to over half of its total emissions in 2021 (KEPCO, 2022, p. 69,181). Also, details are missing from the plans to achieve those targets. The company does not specify what share of the carbon neutrality target will be achieved through emissions reductions within the value chain and what share will come from neutralisation. Overall, KEPCO's carbon neutrality roadmap fails to articulate how the implementation of each mitigation measure will translate to tangible emission reductions.

KEPCO's coal and fossil gas phaseout appears too slow, posing the risk of stranded assets. KEPCO commits to phasing out coal and fossil gas by 2050 (Climate Action 100+, 2022; KEPCO, 2022, p. 59,68), 15-20 years later than the required timeline for advanced economies (CAT, 2023b, p. 1; IEA, 2023c, p. 62). KEPCO is still actively involved in constructing new coal-fired plants in Vietnam (2.4 GW) and Indonesia (2 GW) (KEPCO, 2022, p. 58). By 2030, KEPCO plans to expedite coal exit from overseas projects by selling its existing coal-fired power plants (KEPCO, 2022, p. 59), instead of decommissioning them. Another concern arises from KEPCO's conviction of gas as a 'transition fuel' in its coal phaseout plan, as evidenced by the company's decision to increase the capacity of combined cycle gas power plants, both domestically and internationally, to replace its coal fleets (KEPCO, 2022, p. 54,56, 2023, p. 32). For example, the recently commissioned gas-fired power plant in Malaysia is expected to operate for another 21 years, thereby increasing the risk of future stranded assets (KEPCO, 2022, p. 54,60).

KEPCO's progress in incorporating in renewables into its energy mix is critically inadequate to be aligned with 1.5°C trajectories for the sector. In 2022, only 3.3% of its electricity production came from renewables, remaining stagnant from 2021 (KEPCO, 2022, p. 11, 2023, p. 11). The company's target of increasing this share to 21.5% by 2030 (KEPCO, 2022, p. 70) significantly lags behind the 1.5°C-compatible global benchmark of 59-89% renewables share by 2030 (Boehm *et al.*, 2023, p. 29; CAT, 2023b, p. 16; IEA, 2023c, p. 197; IRENA, 2023c, pp. 22, 75). KEPCO's strategy also includes co-firing 20% of ammonia in coal-fired power generation and 50% of hydrogen in gas-fired power generation by 2036, with a goal of reaching 100% by 2050 (KEPCO, 2023, p. 13). There is a risk that such plans would extend the use of existing fossil fuel infrastructure, rather than a genuine pivot towards more sustainable alternatives, such as renewables-based electrification.

KEPCO's emissions reductions measure involves commercialising carbon capture, utilisation, and storage (CCUS) technologies, which we consider a false solution for the power sector. If unable to sell its overseas coal assets by 2030, KEPCO plans to resort to CCUS as a backup plan (KEPCO, 2022, p. 59,69,76). This reliance on CCUS in electricity generation faces severe risks given these technologies' unproven efficacy and potential environmental impacts, not to mention that it comes at a high cost compared to switching to renewables (Grant *et al.*, 2021). KEPCO's earnings have been on a downward trend, with a substantial operating loss in the fiscal year 2022 due to high and volatile energy costs, as well as capped electricity rates in South Korea (Ng and Ilango, 2022; Ng, 2023). This financial trend highlights the potential risk of relying on CCUS, which practically means continuing its dependence on fossil fuels.

7 Fashion

7.1 Sector highlights

- **Emissions in the fashion sector stem mostly from sourcing raw materials and from material production.** Many of these emissions can be addressed by sourcing renewable electricity and electrifying processes such as textile preparation and colouration. For fashion retailers, most emissions are located in the supply chain.
- **We see an improvement in fashion retailers' emissions disclosure and target setting practices,** both for medium- and long-term targets.
- **The extent to which companies' seemingly ambitious targets are credible will largely depend on the integrity of their strategies for renewable energy in the supply chain.** Despite limited details on supply chain measures, we see signs of high reliance on bioenergy and renewable energy certificates to claim emission reductions. This could significantly undermine the real ambition of these companies' targets.
- **It remains unclear to what extent companies' measures will contribute to and be sufficient for achieving their targets.** All the companies assessed mostly demonstrate awareness of what the key decarbonisation measures for the sector are. However, they present their planned measures in quite ambiguous terms.
- **We have not seen any clear references to more fundamental business-model transitions,** although most companies reflect on the need for the fashion sector to become more sustainable in terms of resource use and GHG emissions. This is especially important as a shift towards a sustainable fashion industry will necessarily mean producing and selling fewer products, which can be at odds with the fast fashion business-model.

Table 19 provides a summary overview of our transparency and integrity ratings for Adidas, Fast Retailing, H&M Group, Inditex and Nike.

Table 19: Overview of integrity ratings for fashion companies

COMPANY	HEADLINE PLEDGE	INTEGRITY	*Tracking & disclosure of emissions*	*Target setting*	*Emission reduction measures*	*Climate contributions & offsetting*	PAGE
H&M Group	Net zero emissions by 2040						p. 108
Inditex	Net zero emissions by 2040						p. 110
Nike	Net zero emissions by 2050						p. 112
Adidas	Climate neutral by 2050						p. 104
Fast Retailing	Carbon neutral by 2050						p. 106

7.2 Sectoral transition framework

The global fashion industry currently emits 0.9-1.2 $GtCO_2e$ per year, or around 5% of global emissions (Nature Climate Change Editorial, 2018; Sadowski, 2023). The sector needs to significantly reduce emissions to align with the Paris agreement 1.5°C temperature goal. According to recent literature, apparel producers will need to reduce its scope 1 emissions by 39-44%, scope 2 by 49-67% and scope 3 by 37% below 2019 levels by 2030 (Dietz, Hastreiter, *et al.*, 2021; Teske, 2022, p. 327). Additionally, the 2023 One Earth Climate Model requires the leather and textile manufacturing industry to reduce the carbon intensity of its electricity and heat supply to 57 gCO_2/kWh by 2030 (Teske *et al.*, 2023 data provided in Dataset 2). For fashion companies such as those covered in our analysis, these benchmarks apply to their supply chain. Finally, SBTi requires fashion companies to reduce their scope 1, 2 and 3 emissions by 4.2% a year to be 1.5°C compatible (SBTi, 2018, p. 20).

Emissions from major fashion brands are located mostly in the supply chain. For apparel companies, scope 1 emissions (with science-based targets) only account for 1% of their total emissions, while scope 3 represents around 96% (Ley *et al.*, 2021). The supply chain of fashion companies can be broken down into four distinct categories (Sadowski *et al.*, 2021; Sadowski, 2023):

- **Tier 4 - raw material extraction:** this includes the cultivation of crops used for fabric such as cotton, as well as the extraction of materials such as nylon and polyester from fossil fuels. It is responsible for around 23% of scope 3 emissions.
- **Tier 3 – raw material processing:** this includes processing raw materials into yarn and other intermediate products. It is responsible for around 15% of scope 3 emissions.
- **Tier 2 – material production:** this includes textile formation (knitting or weaving yarn into fabric), preparation, such as scouring, coloration and additional coloration and finishing, such as heat setting. It is responsible for around 53% of scope 3 emissions.
- **Tier 1 – finished product assembly:** this includes the final assembly of products, including cutting and sewing of fabric into garments. It is responsible for around 8% of scope 3 emissions.

By far, the largest source of emissions in this industry is the use of fossil fuels to produce electricity and heat for manufacturing. Especially significant is the use of coal to generate heat for tier 2 processes. Acknowledging this, many companies set out plans to replace coal for biomass in their tier 2 suppliers, claiming that biomass burning would be a zero or close to zero emissions fuel source. This position has been seriously challenged by recent research, which has identified a series of direct and indirect impacts of the widespread use of biomass, such as incentives for deforestation, which casts serious doubt over the potential benefits of switching to biomass (Searchinger and Heimlich, 2015; Sterman *et al.*, 2018; Flynn and Ball, 2023; Trend Asia, 2023). The industry should instead push towards full electrification of the manufacturing process, as well as the large-scale development of renewable electricity to meaningfully and sustainably reduce their scope 3 emissions.

To sustainably meet demand in future years, these companies will likely need to go beyond increasing energy efficiency and the use of renewables, to also shift their business model towards more quality and less quantity. This shift needs to involve a focus on quality and durability of products, policies to resale, repair and recycle them, and fundamentally, a shift towards less production. According to some estimates, around 73% of the growth in apparel manufacturing between 1980 and 2014 can be attributed to the rise of cheap, fossil fuel-based fabrics such as nylon and polyester. These emissions cannot be eliminated, and there are no readily available, carbon-free alternatives (Stand.earth, 2023). Additionally, many sources of the industry's emissions that are technically possible to abate, are in practice challenging to reduce at the needed pace, and in a sustainable and fair way to workers in manufacturing hubs. Growing demand, and intense competition drive prices down and make it all the more challenging. The fundamental problem with the fast fashion business model is already well understood and acknowledged by major fashion companies, but there is still a long way to go to achieve meaningful change (Drew and Yehounme, 2017; Stand.earth, 2023).

Key actions and measures for the fashion sector

Measures to reduce emissions from raw materials (upstream scope 3)

These emissions are currently some of the hardest to eliminate from the fashion industry value chain, as there are no GHG-free alternatives. However, these emissions can be reduced by increasing the use of current lower-GHG alternatives, and the development and adoption of innovative alternatives.

Commit to lower-GHG material sourcing targets, including recycled fibres and preferred cotton while specifying the GHG-performance of both traditional and alternative products sourced

Critical transitional measure

Emissions from raw materials vary significantly across materials. Commonly used synthetic materials such as polyester and nylon are made from crude oil and have a substantially higher GHG footprint than natural materials. For example, a 2018 study estimated that the emissions associated with producing a polyester t-shirt are 5.5 kg CO_2e, compared to 2.1 kg CO_2e for the production of a cotton t-shirt (Nature Climate Change Editorial, 2018). However, although its GHG footprint is lower, the use of cotton as a raw material also brings its complications, for example land and water use, pesticide pollution, and competition with food crops for arable land.

Current alternatives include mechanically-recycled polyester, mechanically-recycled nylon, organic/preferred cotton, mechanically-recycled cotton and viscose sourced from sustainable fibres (Ley *et al.*, 2021; Sadowski *et al.*, 2021; Sadowski, 2023). However, challenges associated with these processes such as energy requirements and costs also need to be addressed by companies. One especially important aspect is that recycled materials should stem from products of the industry (i.e. apparel and related products), which for polyester and nylon might be significantly more challenging to process than alternatives such as plastic bottles.

Invest in innovative alternatives such as biosynthetic fibres and cotton alternatives to accelerate their development

Enabling measure

Innovative alternatives include biosynthetic fibres, including Bio-PET (Polyethylene terephthalate), Bio-PA (Polyamide e.g. nylon) and polyhydroxyalkanoates (PHA). They also include the use of other natural fibres alternative to cotton, such as hemp, which can be "cottonised" to resemble the properties of cotton (Ley *et al.*, 2021; Sadowski *et al.*, 2021; Sadowski, 2023).

Support suppliers to implement sustainable farming practices to increase the GHG-efficiency of production

Enabling measure

Beyond committing to source higher shares of sustainable materials, companies can also help their tier 4 suppliers, which can sometimes be smaller businesses, to implement best farming practices to reduce the GHG-intensity of their products.

Measures to reduce emissions from manufacturing (upstream scope 3)

Manufacturing emissions in the fashion industry stem mostly from power and heat. There are three main ways to reduce them: RE procurement and generation, increasing energy efficiency, and electrification

Commit to 100% renewable electricity in the supply chain

Critical transitional measure

Renewable electricity procurement is key to decarbonise the fashion industry manufacturing process. Emissions from tier 1 and 3 of the manufacturing process stem mostly from electricity, and could be greatly reduced by switching to 100% renewables using high-quality procurement constructs (Ley *et al.*, 2021; Sadowski *et al.*, 2021; Sadowski, 2023).

Invest in energy efficiency measures, particularly to reduce their need for thermal energy in tier 2 processes (for example through dry processing)

Critical transitional measure

Efficiency measures are low-hanging fruit to reduce emissions because they have high returns on investment through energy savings. However, they also carry high upfront costs. Energy efficiency measures with high impact mostly focus on conserving and recovering heat.

One key measure to reduce emissions from apparel manufacturing is switching to dry processing (tier 2), which can decrease energy use by around 80%. Tier 2 process emissions, which represent over half of the industry's emissions, come from the use of coal to generate heat for textile processing, which is done in large tanks of hot water.

Commit to phase-out coal from value chain, replacing it with renewable heat (such as CSP), or through the electrification of key tier 2 processes (such as dyeing and finishing)

Critical transitional measure

Electrification of heat generation processes will also be necessary to ensure that the manufacturing process can achieve zero GHG emissions. Currently some major fashion brands are starting to make a move away from coal towards biomass for heat production, but this does not necessarily reduce emissions compared to fossil fuels, and it can have other adverse effects.

Measures to shift towards a more sustainable business model

Set reduced overproduction targets and policies to stop discarding new products

Critical transitional measure

A low-hanging fruit to reduce the environmental impact of the industry is to reduce the number of products being discarded throughout the value chain, but especially at the retail level. For example, according to some estimates, reducing overproduction (that is the waste generated due to unsold stock) by 10% through more efficient supply chains and more accurate demand forecast tools could reduce industry-wide emissions by 9% by 2030 (Berg *et al.*, 2020).

Set resale, repair and recycle programs with meaningful and clear targets

Enabling measure

Most large fashion brands now have at least some type of resale, repair or recycle programmes. These can be useful to support a shift to more sustainable business model without overproduction, but without scale, they will likely not have a meaningful impact. Companies need to clearly communicate the scope and scale of their programmes, and transparently show how they can help reduce consumption by extending product life. It is especially important for companies to also address the limitations of current recycling practices, especially for used apparel and related products.

7.3 Adidas

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Fashion	USD 21.4 bn (2022)	6.7 $MtCO_2e$ (2022)	Climate neutral by 2050	Poor	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

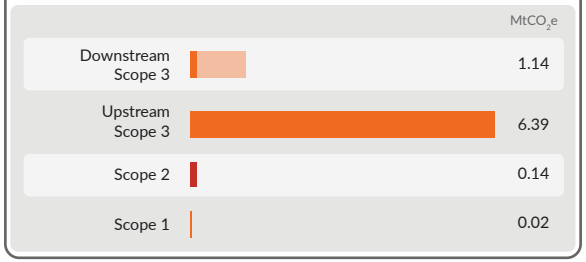
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 6.7 $MtCO_2e$ in 2022

Major emission sources: Purchased goods and services

Disclosure: No public disclosure of s3 emissions in 2017, which is the baseline year for the 2030 reduction target. No location-based reporting for scope 2.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and closure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	***Climate neutral by 2050***		
Short-term targets (up to 2030)	• *Climate neutral across own operations by 2025* • *30% reduction of absolute GHG emissions across by the value chain bu 2030 below 2017 levels.*	◐	◐
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in the period 2017-2022)	32-44% by 2030		
Translation of target to 2019 baseline is unclear due to highly variable emissions between 2017 and 2022. May be partially aligned with sectoral benchmarks.			
Medium-term targets (2031 - 2040)	*No targets for the 2021-2040 timeframe identified.*	○	○
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
No target identified.			
Longer-term targets (2041 - onward)	*No targets for the 2021-2040 timeframe identified.*	○	○
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
Lack of a reduction commitment alongside the climate neutrality pledge.			

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	0% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	2% of 2022 emissions	Standalone RECs are currently used for own operations in Europe and the USA. Intention to shift focus to PPAs, but no further details identified.	○	○
Upstream emissions (scope 3)	95% of 2022 emissions	Measures to phase out coal and increase RE use in the supply chain. Natural gas and biomass also used to replace coal. No commitment to stop overproduction.	◐	◔
Downstream emissions (scope 3)	2% of 2022 emissions	*Not assessed.*	N/A	N/A

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	○	○
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	No plans for future neutralisation claims identified, not clear what share of emissions Adidas plans to neutralise.	○	?

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ○ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Adidas (2023a, 2023b, 2024)*

Adidas

Adidas AG, headquartered in Germany, is one of the world's largest sportswear brands. About 90% of its emissions stem from the production and processing of raw materials and assembly of clothes and shoes (all scope 3, category 1). Adidas implements several promising measures for the decarbonisation of its supply chain, including to phase out coal and increase the use of renewables. However, the company's 2030 target is insufficient to be aligned with 1.5°C-compatible benchmarks for the sector, and its climate neutrality target for 2050 is not yet substantiated with a clear commitment to reduce emissions across the value chain.

Adidas's 2025 climate neutrality target for its own operations has the potential to mislead consumers, while the 2050 climate neutrality target for all emissions is not substantiated with an emission reduction target. Adidas aims to achieve climate neutrality in its own operations by 2025. Within this target, the company committed to reduce scope 1 and 2 emissions by 90% below a 2017 baseline. Since operational emissions account for just 1% of Adidas's emissions along the value chain, this climate neutrality target is highly likely to be misleading to consumers. Adidas also committed to climate neutrality across the value chain by 2050 but has not provided further information on this target (Adidas, 2024). It remains unclear what share of its value chain emissions Adidas plans to reduce towards achieving its climate neutrality claim and what share will be offset with reductions or removals outside the company's value chain.

Adidas's 2030 target may be partially aligned with 1.5°C-compatible benchmarks, but Adidas has not yet made progress towards the target since 2017, and its significance is not entirely clear due to highly variable emissions reported in recent years. The significance of Adidas's target to reduce emissions by 30% by 2030 is not immediately clear, since Adidas does not publish its emissions for the target base year in 2017 in its public documentation. The 2017 baseline emissions are only available in Adidas's non-public CDP response (Adidas, 2023a, pp. 69–74). The meaning of the target is further complicated by the fact that Adidas reports major fluctuations in emissions in the period between 2017 and 2023: 2019 emissions are nearly double the reported emissions in 2017, while values for 2021 to 2023 are closer to the 2017 values. We estimate that the target translates to approximately a reduction of 32-44% of the company's full value chain emissions, compared to average emissions in the time frame between 2017 and 2023. This would indicate a significant reduction, and the upper end of that estimate would be aligned with sector-specific emission reduction benchmarks for the textile and leather industry, which indicate that emissions should decrease by at least 41% between 2019 and 2030 to be aligned with a 1.5°C-compatible trajectory (Teske, 2022, pp. 322, 327). However, the feasibility of achieving the target is called into question by the fact that until 2023, Adidas had not achieved *any* absolute decrease in emissions below 2017 levels.

Adidas's 'Decarbonization Manifesto' combines a range of promising support measures, incentives, and requirements for its suppliers to move away from using coal in the production process. Adidas requires its tier 1 and tier 2 suppliers to phase phase-out coal boilers by 2025 but allows them to switch to natural gas or biomass (Adidas, 2024, p. 87). Neither is a credible decarbonisation option: switching to natural gas-fired boilers may lead to locking in fossil fuels, while biomass production and combustion leads to GHG emissions and a range of other sustainability problems, including biodiversity loss *(see section 3.3)*.

Adidas's plan to provide support for suppliers to access PPAs to procure renewable electricity could represent another promising signal (Adidas, 2024, p. 87). However, we could not identify further details on what this support entails and what outcomes it has achieved. At the same time, Adidas also encourages suppliers to procure standalone RECs, which are far less likely to result in real emission reductions than PPAs. High-quality procurement constructs can be especially difficult to access in some countries, so it is encouraging to see evidence of advocacy efforts with national governments and grid operators in Indonesia, Cambodia and Vietnam (Adidas, 2023b, p. 84). Adidas also reports that it will consider suppliers' performance on renewable electricity procurement in their supplier assessment process.

Adidas's plans for "sustainable articles" are unsubstantiated and may not result in significant GHG emission reductions. The company set out the ambition that 90% of its articles will be sustainable by 2025 (Adidas, 2024, p. 90), using an ambiguous definition. Adidas considers articles to be sustainable "when they show environmental benefits versus conventional articles due to the materials used, meaning that they are – to a significant degree – made with environmentally preferred materials." While Adidas provides examples of such materials, these were insufficient to appreciate their mitigation potential. There are also concerns about the effectiveness of some of the standards that Adidas uses to select "environmentally preferred materials". For instance, while the company claims that 99% of its leather volume is audited in accordance with the Leather Working Group protocol (Adidas, 2024, p. 91), the production of its sneakers is linked to animal husbandry in and deforestation of the Amazon (Stand.earth, 2021; Heugten, 2024). Adidas does not follow the HLEG's key recommendation to a deforestation-free supply chain by 2025 (UN HLEG, 2022, p. 26). The committed to a "deforestation and conversion free" leather supply chain by 2030 and started to map its supply chain beyond tier 3 suppliers, but does not yet present a concrete set of measures to end deforestation linked to leather production (Adidas, 2024, pp. 92, 94). Adidas plans to set "deforestation and conversion free" targets for natural rubber and timber-derived materials in the future.

7.4 Fast Retailing

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Fashion	USD 17.5 bn (2022)	6.0 $MtCO_2e$ (2022)	Carbon neutrality by 2050	Poor	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

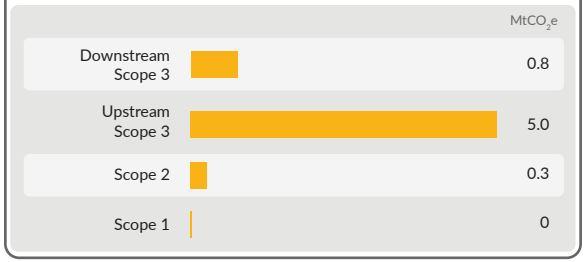
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 6.0 $MtCO_2e$ in 2022

Major emission sources: Scope 3 accounts for 95% of Fast Retailing's emissions. Purchased goods (70%) are the most important source. Use of sold products is shown separately and not counted towards the total.

Disclosure: GHG reported for all years and most categories. Activity indicators not provided for all scopes. Lowest S2 value used for total emissions.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	*Carbon neutrality by 2050*		
Short-term targets (up to 2030)	*To reduce scope 1 and 2 emissions by 90% and scope 3 emissions (from the production of raw materials for products, fabric production and garment manufacturing) by 20% by FY2030*	●	◔
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	19% by 2030		
Targeted emission reductions across the company's whole value chain are insufficient to meet the global benchmark of 43% GHG emission reductions by 2030.			
Medium-term targets (2031 - 2040)	*No target identified.*	◌	◌
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
No target identified.			
Longer-term targets (2040 - onward)	*Carbon neutrality by 2050.*	◌	◌
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
Carbon neutrality target is not supported by emission reduction target			

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	0% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	5% of 2022 emissions	Most electricity procured to date through standalone RECs. No clear commitment to use high quality constructs towards 100% RE target.	◔	◔
Upstream emissions (scope 3)	82% of 2022 emissions	Measures cover most key areas but lack sufficient information to estimate impact.	◔	◌
Downstream emissions (scope 3)	13% of 2022 emissions	*Not assessed.*	N/A	N/A

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	◌	◌
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	The company has not announced any plans to neutralise residual emissions in the future, although it aims for carbon neutrality by 2050.	◌	?

5-point rating scale: ● High ◕ Reasonable ◑ Moderate ◔ Poor ◌ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Fast Retailing (2021, 2023a, 2023b) and Uniqlo (2022)*

Fast Retailing

Fast Retailing Co., Ltd. (Fast Retailing) is a Japanese fashion retail multinational company that owns the Uniqlo brand, among others. Most of its emissions stem from materials sourcing and manufacturing in the supply chain (~95%). To tackle these emissions, the company facilitates suppliers to develop emission reduction plans, but it discloses few details on the goals and ambitions of these plans. The company's 2030 emission reduction targets fall far short of what is needed to limit global warming to 1.5°C.

Key developments over the past year: We could identify only minor changes to Fast Retailing's sustainability strategy from our previous analysis of the case study in the *2022 Corporate Climate Responsibility Monitor* (Day *et al.*, 2022). Accordingly, only minor modifications were made to this case study.

Fast Retailing's 2030 targets collectively amount to a reduction of 19% of the company's emissions footprint compared to 2019, which is not aligned with global efforts to limit global warming to 1.5°C. Fast Retailing has two targets to be achieved by 2030, these are validated to be 1.5°C-compatible by the SBTi. The first one is 20% absolute reduction of supply-chain emissions, specifically from raw materials, fabric, and garment production for the Uniqlo and GU brands, which represent ~95% of the company's revenue (Fast Retailing, 2023b, p. 17). The second one is 90% absolute reduction of operational emissions (scopes 1 and 2, under direct company control) (Fast Retailing, 2021, p. 29). These two targets cover 74% of the company's emissions footprint and exclude emission sources like the end-of-life treatment of sold products. They equate to an emissions reduction commitment of just 19% across the full value chain, compared to 2019 levels, falling short of the IPCC's estimate of minimum 43% global GHG emission reductions by 2030 to keep warming below 1.5°C (IPCC, 2022). Furthermore, a sectoral 1.5°C-aligned benchmark indicates that fashion retailers should reduce upstream scope 3 emissions by a minimum of 41% between 2019 and 2030 (Teske, 2022), but Fast Retailing only commits to 16% upstream scope 3 emission reductions by that year.

Fast Retailing has expressed the aim to reach net-zero emissions by 2050, but it has not disclosed a concrete plan for emission reductions between 2030 and 2050. Fast Retailing's climate strategy focuses on 2030 emission reduction targets. Although it expresses the intention to 'strengthen our efforts to achieve net zero GHG emissions by 2050' (Fast Retailing, 2023b, p. 17), it does not clarify what these efforts would entail in the future. The company does not disclose whether it will reach the net-zero target through further emission reductions or through emissions offsetting in the 2030–2050 period.

Fast Retailing's emission reduction measures focus on emission reduction plans for supplying factories, but details on how the company engages with suppliers—the company's main source of emissions—remain limited. To address emissions from corporate sites, Fast Retailing aims to improve energy efficiency by installing LED lighting, automatic temperature control, and more efficient air conditioning (Fast Retailing, 2023b, p. 56, 2023a). However, these measures only target 5% of the company's emissions footprint (scope 2) (Fast Retailing, 2023a). Fast Retailing's most significant source of emissions (76% of its emissions footprint) is the manufacturing of garments in third-party factories, including raw material production, fabric production, and sewing. To address these emissions, the company reports to be recycling more materials and piloting clothing repair stations (Uniqlo, 2022; Fast Retailing, 2023a). While repair stations could potentially extend products' lifetimes, they would have a significant impact in emission reductions *only if* they would lead to a shift in consumer behaviour and a reduction in the volume of new garments purchased and produced. We did not identify any clear indication that Fast Retailing is preparing to shift away from a fast fashion business model.

Fast Retailing also claims to cooperate with suppliers by providing them with supplier-tailored emission reduction plans (Fast Retailing, 2023b, p. 56, 2023a). These include energy-saving and renewable-energy measures, like eliminating coal energy from manufacturing processes, and Fast Retailing pledges support for their implementation (Fast Retailing, 2023b, p. 56). However, the company does not provide specifics on the coverage and depth of the emission reduction plans, what its pledged support entails, or how it aims to enforce them. While this level of supplier interaction may represent good practice, the lack of details does not facilitate a complete understanding of whether Fast Retailing's strategy will be sufficiently effective at reducing supply-chain emissions.

Fast Retailing aims to use 100% renewable electricity by 2030, but it does not commit to procurement options that would likely result in additional renewable electricity capacity. In 2022, Fast Retailing claims to have sourced 42% of its electricity consumption from renewable sources (Fast Retailing, 2023a, p. 3). In 2021, the company recently installed solar PV capacity at 13 stores in Japan, and in 2022 it expanded the initiative to its North America and Southeast Asia stores, specifying that electricity will be procured through PPAs. However, the company's electricity procurement in 2022 came almost exclusively from standalone RECs. To ensure that its 2030 renewable electricity target results in truly additional renewable electricity capacity and the abatement of the company's energy-related emissions, Fast Retailing should move towards high-quality constructs and 24/7 matching.

7.5 H&M Group

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Fashion	USD 22.1 bn (2022)	6.1 $MtCO_2e$ (2022)	Net zero by 2040	Reasonable	Moderate

1 TRACKING AND DISCLOSURE OF EMISSIONS

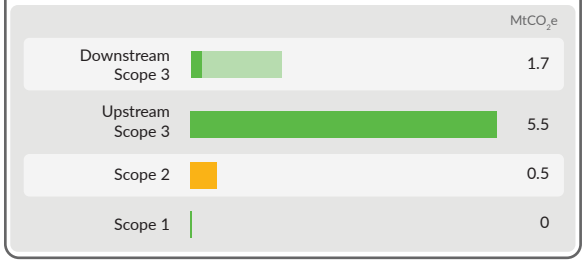
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 6.1 $MtCO_2e$ in 2022

Major emission sources: Scope 3 accounts for 94% of H&M's emissions. Purchased goods (67%) are the most important source. Use of sold products is shown separately and not counted towards the total.

Disclosure: GHG reported for all years and most categories. Activity indicators provided for all scopes. Lowest S2 value used for total emissions.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	*Net zero by 2040*		
Short-term targets (up to 2030)	*Reduce scope 1, 2, and 3 by 56% below 2019 levels*	●	◔
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	56% by 2030		
Target includes all relevant information. Target in line with existing benchmarks.			
Medium-term targets (2031 - 2040)	*Reducing scope 1, 2 and 3 emissions by 90% below 2018*	◔	◔
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	90% by 2040		
Target includes all relevant information. Target in line with existing benchmarks.			
Longer-term targets (2041 - onward)	*No target identified.*	N/A	N/A
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
No target identified.			

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	0.4% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	7.6% of 2022 emissions	H&M signals that it plans to use PPAs to implement its 2030 target for 100% renewable electricity, but does not commit to hourly matching.	◐	◐
Upstream emissions (scope 3)	88.9% of 2022 emissions	Measures cover all key areas but lack sufficient information to estimate impact, especially regarding the use of biomass and reducing (over)production.	◐	◔
Downstream emissions (scope 3)	3.1% of 2022 emissions	*Not assessed.*	N/A	N/A

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	Unclear whether H&M plans to make climate contributions, for example through its LEAF membership.	◔	?
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	Plan to neutralise residual emissions equal to 10% of 2019 emissions. Agreements have been signed for DACCS, but LEAF coalition membership may also imply a partial reliance on biological CDR.	◔	◔

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ○ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *H&M Group (2023a, 2023b, 2023c, 2023d)*

H&M Group

H&M Group is a Sweden-based fast fashion retailer that comprises of eight brands, including H&M, COS and Monki. The majority of H&M Group's emissions stem from fabric production, garment manufacturing and raw materials (~92%). Although H&M Group has ambitious emission reduction targets for 2030 and 2040, those may be undermined by the lack of a clear plan for implementing measures to achieve those targets.

Key developments over the past year: We could identify only minor changes to H&M Group's sustainability strategy since our previous analysis of the case study in the *2022 Corporate Climate Responsibility Monitor* (Day *et al.*, 2022). Accordingly, only minor modifications were made to this case study.

H&M Group plans to reduce emissions across its value chain by 56% by 2030 and by 90% by 2040 below 2019. These may be ambitious targets that signal the need for immediate climate action, as long as they are not undermined by reliance on standalone RECs and biomass to claim decarbonisation of the supply chain. Their 2040 net-zero target is accompanied by the commitment to reduce emissions across the value chain by 90%. H&M group plans to offset the remaining 10% of emissions with "permanent" carbon dioxide removals and has recently signed an agreement for direct air capture (DAC) (H&M Group, 2023d, p. 31). This ambition level goes beyond the global benchmark for a 1.5-compatible emission reduction trajectory. However, the true ambition level of H&M Group's targets depends on the measures used to achieve them. Based on their latest CDP disclosure, we see signals that the company could be planning to rely heavily on standalone RECs and biomass to claim the decarbonisation of its supply chain, which could severely compromise these targets (H&M Group, 2023b).

H&M Group committed to a target of 100% renewable electricity in the supply chain by 2030, but the significance of the target may be undermined by the lack of commitment to electrify key manufacturing processes. The company states that by 2030, the electricity sourced in the supply chain will be 100% renewable (H&M Group, 2023d, p. 26). Given that most of the company's suppliers are based in Southeast Asia, where policies are often not conducive to renewable energy procurement, this target may be ambitious. However, much of the energy consumption in the clothing manufacturing process typically derives from other energy carriers, and we identify no commitment to shift to non-combustible sources of renewable power (e.g. wind, solar, hydro, and geothermal), but only a mention of a "push to phase out coal and electrify steam" (H&M Group, 2023a). As such, the supply chain renewable electricity target may be somewhat misleading due to its limited significance. We could also not clearly identify how H&M Group plans to achieve this target. The company lists several initiatives, including an *Energy Expert Team* that provides suppliers with data, information and training on renewable energy and energy efficiency, and the initiation of a *Sustainable Supplier Facility* that allows brands and suppliers to co-invest in in decarbonisation technologies (H&M Group, 2023c). These plans may represent good practice examples for supplier engagement, but further details would be necessary to understand their real impact.

H&M Group covers most key emission reduction measures; however, more detailed information is needed to understand their likely reduction impact. Decarbonising the fashion sector requires a diverse set of reduction measures, including reducing overproduction, phasing out coal, switching to renewable energy, maximising material and energy efficiency, and ramping up the development of innovative materials (Berg *et al.*, 2020; Ley *et al.*, 2021; Sadowski *et al.*, 2021). While H&M Group refers to most of these measures in its public communications, it stops short of disclosing to what extent these will reduce emissions across the value chain (H&M Group, 2023d). For example, measures to support farmers (tier 4) as well as tier 1 and 2 suppliers cover necessary areas but lack detail about the GHG impact of their implementation. Measures and targets related to sourcing more sustainable and recycled materials (so-called "preferred materials") provide enough detail to understand the current situation and progress towards targets but lack information regarding the GHG performance of "preferred materials" and recycled materials, to understand the full impact of the switch. H&M Group refers to external sustainability standards to define what counts under their "preferred materials", such as the Materials Sustainability Index, but fail to disclose GHG performance data of their current and future materials. The company also highlights various innovative materials they are investing in but does not outline to what scale these could be used in the next decade and what their emission reduction potential is. Finally, while the company claims to be in the process of shifting towards a circular fashion model, it does not refer to the impact of such a shift on its production volumes, resource intensity and GHG footprint.

H&M Group commits to 100% renewable energy in its own operations, but this target will only result in real emission reduction if the renewable energy is sourced from high-quality constructs. H&M Group claims that in 2022, 92% of its electricity consumption came from renewable sources (H&M Group, 2023d, p. 31). This is mostly done through the procurement of standalone RECs, which in some cases are purchased in one country and used in another. For example, H&M Group uses Norwegian RECs to claim their electricity consumption in Bulgaria and Croatia came from renewable sources. Standalone RECs do not generally contribute to the installation of additional renewable energy capacity and are not a suitable approach for companies to reduce their electricity-related emissions. In 2024, H&M group complemented their existing renewables target, by adding that by 2030, at least half of the renewable energy procured for their own operations should come from PPAs with new renewable electricity generation (H&M Group 2024, p21). H&M Group could further improve its future renewable sourcing strategy by making clearer commitments to using only high-quality constructs and moving to a 24/7 matching approach.

7.6 Inditex

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Fashion	USD 34.2 bn (2022)	14.2 $MtCO_2e$ (2022)	Net zero by 2040	Reasonable	Moderate

1 TRACKING AND DISCLOSURE OF EMISSIONS

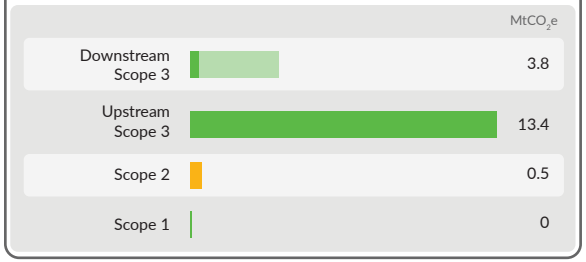
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 14.2 $MtCO_2e$ in 2022

Major emission sources: Scope 3 accounts for 97% of Inditex's emissions. Purchased goods (77%) are the most important source. Use of sold products is shown separately and not counted towards the total.

Disclosure: GHG reported for all years and most categories. Activity indicators provided for all scopes. Lowest S2 value used for total emissions.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	*Net zero by 2040*		
Short-term targets (up to 2030)	*Reducing scope 1 and 2 emissions by 90% and scope 3 by 50% below 2018 levels by 2030*	●	◔
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	46% by 2030		
Target in line with existing benchmarks, but no interim target identified.			
Medium-term targets (2031 - 2040)	*Reducing scope 1, 2 and 3 emissions by 90% below 2018*	◔	◔
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	91% by 2040		
Target in line with existing benchmarks, but no interim target identified.			
Longer-term targets (2041 - onward)	*No target identified.*	N/A	N/A
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
No target identified.			

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	0.1% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	3.2% of 2022 emissions	Inditex is increasing its use of PPAs to reach 60% of its electricity consumption by 2030, improving its previous reliance on standalone RECs for its 100% renewable claim.	◑	◑
Upstream emissions (scope 3)	94.3% of 2022 emissions	Measures cover all key areas but lack sufficient information to clarify impact, especially regarding the use of biomass and reducing (over)production.	◑	◔
Downstream emissions (scope 3)	2.5% of 2022 emissions	*Not assessed.*	N/A	N/A

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	○	○
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	Plans to neutralise residual emissions equal to 11% of 2019 emissions to achieve 2040 net zero target. No further details provided.	◑	◑

5-point rating scale: ● High ◕ Reasonable ◑ Moderate ◔ Poor ○ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Inditex (2023a, 2023b)*

Inditex

Industria de Diseno Textil S.A. (Inditex) is a Spanish-based multinational fashion retailer, better known for its flagship brand Zara. It is the biggest fast fashion group in the world by revenue, with USD 34.2 billion in 2022. Most of its emissions stem from its supply chain, especially those related to the sourcing and processing of raw materials. Inditex's pledge for net-zero emissions by 2040 implies an ambitious 89% emission reduction below 2019 levels, which is aligned with 1.5°C benchmarks for the sector. However, the sufficiency of Inditex's emission reduction measures to meet the company's ambitious targets remains unclear.

Inditex's net zero pledge is now substantiated by a deep emission reduction target across the value chain. Since our last analysis in February 2023, Inditex has updated its climate commitments (Inditex, 2023b, p. 7) which now include a commitment to achieve a 90% emission reduction across all scopes by 2040 below 2018 levels. We have estimated that this target implies an 89% reduction below 2019 levels by 2040, which is aligned with sector-specific benchmarks to limit global warming to 1.5°C. Inditex's new target represents a significant improvement compared to our previous assessment, but its significance for reducing global emissions will hinge on how emissions from energy in the value chain are reduced.

The company's interim 2030 targets amount to a 46% emissions reduction below 2019 levels, which is also likely aligned with global efforts to limit global warming to 1.5°C. Inditex has also updated its 2030 emission reduction targets in the past year. It specified that its scope 1 and 2 target of a 90% reduction below 2018 levels only covers market-based scope 2 emissions, excluding location-based scope 2 emissions *(for more information on why it is important that companies report scope 2 emissions under both accounting methods, please see Methodology Section 1.1)*. Inditex has also committed to reducing its scope 3 emissions (excluding capital goods and franchises) by 50% below 2018 levels (Inditex, 2023b, p. 7). This target has been substantially improved since our last assessment in 2022 (up from 20%), and now brings Inditex's overall 2030 climate commitments in line with existing 1.5°C-compatible benchmarks.

Inditex's current approach to procuring renewable electricity has significant limitations that undermine its 100% renewables claim. With the information available, we understand that over 99% of Inditex's operational electricity consumption in 2022 was matched by standalone RECs of unspecified vintages. Self-generation projects in specific locations accounted for a very minor share of supply. Although Inditex specifies that it purchases RECs from the same grid on which demand is placed, the purchase of standalone RECs offers no real prospects for supporting additional renewable energy capacity and grid decarbonisation in many regions, including Europe, which is the major region of Inditex's operations (Mulder and Zomer, 2016; Brander et al., 2018; Bjørn et al., 2022). Recognising the need to improve its renewable electricity procurement, Inditex aims to source 60% of its electricity demand from own generation and PPAs and VPPAs by 2030 (Inditex, 2024b, p. 10). While this is likely a step forward from their current practice of 99% standalone REC procurement, the integrity of their new target will depend on details such as the location and age of the installations they purchase electricity from, as well the matching method used *(see section 3.2)*.

Inditex's emission reduction measures cover most key areas but are not detailed enough to understand their potential significance. Inditex has targets and measures to reduce emissions from raw materials sourcing, including switching to "preferred materials" such as organic cotton and investing in innovative fibres that can substitute either cotton or fossil fuel-based fibres such as nylon (Inditex, 2023a, 2023b). However, the company does not present a clear estimate of what these measures would mean in terms of emission reduction. Inditex also has clear targets and measures to increase recycling and reusing its products and shows detailed information to help readers understand the order of magnitude of the current implementation of its measures today (Inditex, 2023b, 2023a). Reaching deep decarbonisation will require fashion retailers to move away from a quantity-focused fast fashion business model to a less resource intensive production model. Inditex's strategy includes a shift towards increasing the durability of its products, as well as increasing circularity of the materials used (Inditex, 2023b, 2023a), but it stops short of estimating what the achievement of its climate targets will mean for its business volume and resource use.

Inditex plans to phase out coal from its supply chain, but is encouraging suppliers to move to bioenergy, which would have negative climate and environmental consequences. While Inditex states to encourage electrification of processes, where possible, the company also encourages suppliers to move to bioenergy in some processes. Inditex could be clearer about for which processes and in what situations it pursues bioenergy as a sustainable solution. If Inditex encourages suppliers to use bioenergy for processes that could be electrified, this can considerably undermine the significance of any renewable electricity targets set for the supply chain. While the IEA considers bioenergy a "renewable" energy source, the sustainable potential for bioenergy is very limited and should only be used for processes that cannot be electrified or otherwise served by modern renewable heat sources such as concentrated solar or geothermal energy *[see discussion in section 3.3]*. A substantial increase in demand for bioenergy will contribute to issues such as biodiversity loss, water pollution, land conflicts and an increase GHG emissions.

Information on electricity use and renewable electricity targets in the supply chain is very limited, despite the high relevance of this emission source in Inditex's overall value chain. A substantial share of emissions from manufacturing textiles derive from carbon-intensive electricity use, so switching to renewable electricity in the supply chain is a critical measure in decarbonising the fashion industry (Berg et al., 2020; Ley et al., 2021; Sadowski et al., 2021). While Inditex's GHG emission disclosure in 2022 indicated that over 94% of its full value chain emissions (excluding indirect use-phase emissions) derive from the company's supply chain, we could not identify any quantitative estimates on electricity consumption within the supply chain, nor on renewable electricity generation or procurement instruments. The target for facilities in the supply chain to "increase the purchase and/or generation of electricity coming from 100% renewable sources" (Inditex, 2023a) is potentially misleading. This could be misunderstood as a target for 100% renewable electricity, although it only sets to increase the procurement of renewable energy to an undefined level and without a target year. In its 2023 sustainability report, Inditex includes a target to procure at least 50% of the electricity used for manufacturing processes in its supply chain from renewable sources by 2030, and 100% by 2040 (Inditex, 2024a, p. 201). However, it stops short of determining which procurement mechanisms will be used to achieve its target, which can greatly influence its integrity. Additionally, without a parallel commitment to electrify manufacturing processes, Inditex's supply chain target leaves out a significant share of its emissions, especially those associated with the use of coal boilers.

7.7 Nike

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Fashion	USD 51.2 bn (2022)	10.2 $MtCO_2e$ (2022)	Net zero by 2050	Moderate	Moderate

1 TRACKING AND DISCLOSURE OF EMISSIONS

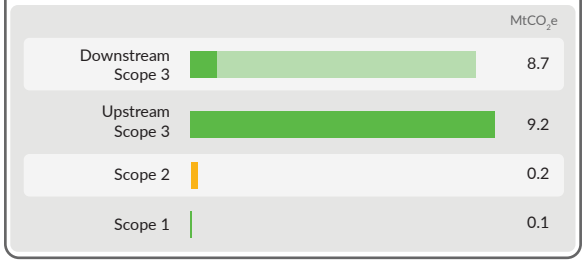
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 10.2 $MtCO_2e$ in 2022

Major emission sources: Scope 3 accounts for 97% of Nike's emissions. It's most important source is purchased goods and services (83%). Use of sold products is shown separately and not counted towards the total.

Disclosure: GHG reported for all years and most categories. Explanations provided for missing categories. Activity indicators provided for all scopes.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	***Net zero by 2050***		
Short-term targets (up to 2030)	• *By 2025: reduce s1 and s2 by 70% below 2020 levels* • *By 2030: reduce s1 and s2 by 65% below 2015 levels, reduce s3 by 30% below 2015 levels*	●	◕
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	41% by 2030		
	2030 target includes is in line with existing fashion benchmarks. No interim scope 3 target.		
Medium-term targets (2031 - 2040)	*No targets for the 2021-2040 timeframe identified.*	◌	◌
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
	No target identified.		
Longer-term targets (2041 - onward)	*Net zero by 2050. Reducing s1, s2 and s3 emissions by 90% below 2015.*	◕	◕
Scope coverage	S1 S2 S3↑ S3↓		
Own emission reductions (compared to full value chain in 2019)	91% by 2050		
	Target in line with existing benchmarks, but no interim target identified.		

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	0.5% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	2.2% of 2022 emissions	Nike is close to meeting its target for 100% RE by 2025, mostly through local PPAs, but does not commit to hourly matching.	◐	◐
Upstream emissions (scope 3)	90.4% of 2022 emissions	Measures cover all key areas but lack sufficient information to clarify impact, especially regarding the use of biomass and reducing (over)production.	◐	◔
Downstream emissions (scope 3)	6.9% of 2022 emissions	*Not assessed.*	N/A	N/A

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	◌	◌
Misleading offseting claims today	*No offsetting claim identified.*	N/A	N/A
Approach to residual emissions	Plans to neutralise residual emissions equal to 9% of 2019 emissions. No details disclosed on types of CDR.	◐	◐

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ◌ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Nike (2023)*

Nike

Nike Inc. is a US-based multinational fashion retailer. It is one of the largest in the world by revenue, reaching USD 51.2 billion in 2022. Like other large fashion retailers, Nike's emissions stem mostly from its supply chain, especially from sourcing materials and manufacturing. Nike's most prominent emission reduction targets imply a ~41% reduction by 2030 below 2019 levels, which is almost aligned with 1.5°C compatible benchmarks for the fashion sector. It remains unclear to what extent Nike's proposed measures will be sufficient to achieve its targets.

Nike's 2030 targets imply a 41% reduction in total value chain emissions below 2019 levels, which is aligned with 1.5°C compatible benchmarks for the fashion sector. The targets are prominently presented and all the relevant emissions data to understand their impact is available in the company's own reports (Nike, 2023, p. 108). Nike's scope 3 target does not include emissions from the use of sold products, which represent a significant share of the company's total emissions. However, this is because these emissions stem mostly from the washing and drying of Nike's products, over which the company has little control. This is an *optional* rather than a mandatory reporting category of the GHG Protocol Corporate Standard, and its exclusion from the target is reasonable. Including these emissions in the target could be misleading, as major progress towards the targets could otherwise be achieved by the decarbonisation of the power grid and improvements in appliance efficiency, with little to no action from the company. Nike also set out a 2050 net zero target which is not prominently presented, but rather only mentioned once at the end of its 2022 impact report (Nike, 2023, p. 182). The target implies a 91% reduction in total value chain emissions below 2019 levels, which meets 1.5°C-compatible benchmarks for the fashion sector.

Nike's strategy covers most of the key decarbonisation measures identified for the sector but lacks sufficient detail to understand their expected GHG impact. Nike commits to eliminating coal from its value chain by 2030 and it mentions potentially sustainable solutions such as the electrification of steam, but the company stops short of committing to non-combustible sources of renewable power (e.g. wind, solar, hydro, and geothermal), leaving open the option of less sustainable energy solutions such as the use of biomass. The company also reports to engage with suppliers to increase energy efficiency, as well as on-site renewables and purchasing renewable energy. Nike mentions that it only plans to use standalone RECs or other certificates as a bridge measure until higher quality options are available. However, there is no associated target or commitment to increase the use of renewables in Nike's supply chain, nor a clear commitment to move entirely away from low quality procurement constructs such as standalone RECs. Nike has targets to improve the GHG footprint of its materials, including a target to increase "preferred materials" to 50% of all materials by 2025, with an estimated 0.5 $MtCO_2e$ saving, and to reduce waste from the manufacturing process. Its strategy also covers other related aspects such as repairing and reselling used products but does not include associated targets. Finally, Nike's strategy does not include information on other key aspects such as engagement with tier 4 suppliers (such as a farmers) to incentivise adoption of best practices, plans to invest in innovative materials, or plans to reduce (over)production.

Nike also set out a series of 2025 targets to reduce emissions in its own operations and to address some emission sources in its value chain. Its main targets are to reduce scope 1 and 2 emissions by 70% below 2020 levels by 2025. Nike indicates that these targets will be achieved mostly through purchases of renewable electricity (Nike, 2023, p. 13). Other targets include to maintain emissions from manufacturing and transportation. The existence of short-term targets is a positive signal that the company is committed to immediate action. However, the significance of their targets will depend on the measures pursued to achieve them, especially related to the procurement of renewable electricity.

Nike claims that its operational electricity consumption derives 96% from renewable sources today, and aims for 100% by 2025 (Nike, 2024, p. 12), but the quality of procurement constructs remains unclear. Roughly a quarter of its renewable electricity demand is met by RECs and three quarters by PPAs (Nike, 2023, pp. 192–193). Only a relatively insignificant share of electricity demand today is generated with own capacity. Nike provides limited details on the PPA constructs, many of which appear to be established with generation facilities located in different countries to the location of consumption. Therefore, clarity is still lacking regarding the extent to which the PPAs lead to additional renewable electricity capacity on the grid, and the extent to which Nike's claim of 93% renewable electricity is met by adequate constructs.

8 Food & agriculture

8.1 Sector highlights

- **Emissions from the food and agriculture companies assessed here mainly stem from upstream agricultural emissions (scope 3),** from livestock (enteric fermentation), crop production, fertiliser production and application, and land-use change (deforestation). A large share of these emissions can be reduced by reducing animal-source food and increasing plant-rich foods in diets, eliminating deforestation and minimising food loss and waste.
- **We see an improvement in the quality of some food and agriculture companies' emissions reporting and disclosure:** some of the companies we assessed cover a larger share of their upstream and downstream value chain emissions in their disclosure. Public-facing sustainability reports now generally include a breakdown of scope 3 emissions, highlighting the emissions-intensive nature of sourcing of ingredients.
- **Four out of the five food and agriculture companies assessed here have targets that are aligned with SBTi's FLAG guidance,** which also means that the companies have separate targets for their energy and industry-related emissions and for their forest, land and agriculture (FLAG) emissions. In general, we see a reasonable level of long-term ambition for non-FLAG emissions among the assessed companies.
- **For the FLAG targets, however, land sequestration CDR plays an undefined role, significantly undermining the real ambition level of some companies' targets.** Current guidance allows companies to aggregate emissions and removals, and allows for land sequestration CDR to count toward emission reduction targets, due to the difficulties of disaggregating emissions and sequestration in some agricultural sectors.
- **The potentially significant role for land sequestration CDR obscures the lack of critical transition measures for emission reductions in the food and agriculture sector.** Only one company presents a plan to increase the share of plant-based protein and products with a lower carbon footprint. The lack of real commitments to transition toward less emissions-intensive business models, such as focusing on plant-based protein to reduce livestock herds, is not immediately clear from companies' FLAG targets due to the significant potential role of CDR towards their emission reduction targets *(see also section 3.4)*.

Table 20 provides a summary overview of our transparency and integrity ratings for Danone, Mars, Nestlé, Tesco and Walmart.

Table 20: Overview of integrity ratings for agrifood companies

COMPANY	HEADLINE PLEDGE	INTEGRITY	*Tracking & disclosure of emissions*	*Target setting*	*Emission reduction measures*	*Climate contributions & offsetting*	PAGE
Danone	Net zero emissions by 2050	◐	◕	◐	◕	◔	p. 118
Mars	Net zero emissions by 2050	◐	◐	◕	◐	◔	p. 120
Nestlé	Net zero emissions by 2050	◔	◐	◔	◔	◌	p. 122
Walmart	Zero emissions in operations by 2040	◔	◔	◌	◐	◔	p. 126
Tesco	Net zero emissions by 2050	◌	◔	?	◌	◌	p. 124

8.2 Sectoral transition framework

Food system emissions are estimated to account for almost a third of global emissions annually: 16 $GtCO_2e$ per year (Crippa *et al.*, 2021; Boehm *et al.*, 2023). A deep and rapid transition in the food system is crucial: even if fossil fuel emissions were to be eliminated immediately, global food system emissions alone would make it impossible to limit global warming to 1.5°C (Clark *et al.*, 2020). Against this backdrop, the IPCC's Sixth Assessment Report states that a rapid decrease in food system emissions requires extensive and unprecedented actions from both the demand and supply sides.

Companies assessed here include food processors and retailers. Almost 90% such companies' disclosed emissions are attributable to scope 3 emissions. The largest emission sources include livestock, crop cultivation, land use, and land-use change, so measures to reduce these emissions are crucial to limit warming to 1.5°C (T. C. Liu *et al.*, 2023, p. 6). Major emissions generated from the food system include deforestation and land clearing, production and use of fertilizers and other agrichemicals, enteric fermentation during the production of ruminants (cows, sheep, goats), production of rice paddies, livestock manure and combustion of fossil fuels in food production and supply chains (Clark *et al.*, 2020). Relevant emission reduction strategies for the food and agriculture sector include (Roe *et al.*, 2019; Clark *et al.*, 2020):

- Reducing the emissions from agricultural activities (with reducing emissions from enteric fermentation, synthetic fertilizer production, and rice cultivation being the main measures),
- Halting deforestation and land degradation
- Shifting to regional, plant-based diets
- Lowering per capita calorie intake
- Increasing agricultural yields
- Reducing food loss and waste
- Enhancing soil carbon sequestration

If these crucial measures are implemented with an accelerated pace, global food system emissions could reach net zero, or even reach net *negative* emissions, by 2050. This requires deep emission reductions of annually 3.3%, as well as exploiting the emission removals of the sector through extensive soil carbon sequestration, land restoration, pursuing agroforestry and improved land and forest management (Clark *et al.*, 2020; Costa *et al.*, 2022).

The livestock sector is responsible for 80% of global methane (CH_4) emissions – a very potent greenhouse gas with an immediate warming effect – and for about 12% of anthropogenic warming to date (Reisinger *et al.*, 2021). If current livestock expansion rates remain the same, emissions from land-use change could emit 6 $GtCO_2e$/year by 2050, representing about 65% of total agricultural emissions (Searchinger *et al.*, 2019, p. 23). By expanding into natural ecosystems, livestock systems are also a major driver of land-use change and deforestation, causing significant CO_2 emissions and biodiversity loss (Searchinger *et al.*, 2019; Boehm *et al.*, 2023, p. 105). Global pathways consistent with limiting warming to 1.5°C with no or limited overshoot call for livestock methane emissions to fall by 38% by 2050 relative to 2010 and continue to decline toward 2100 (Reisinger *et al.*, 2021). Failure to reduce livestock methane emissions would seriously impede the feasibility of limiting warming to 1.5°C. Dietary changes, such as adopting plant-rich diets will be essential to reduce methane emissions.

Various emissions benchmarks are presented in the literature. The lack of a single agreed-upon benchmark stems from the sector's complexity and the need to balance multiple objectives such as emissions reductions, food security, farmer livelihoods, biodiversity, and emissions removals. The targets range from reducing absolute agricultural production emissions by 39% by 2050 compared to 2017 levels (Boehm *et al.*, 2023, p. 126) to an 85% reduction in emissions by 2050 compared to 2020 levels (Roe *et al.*, 2019; Dietz and Jahn, 2024). The wide range of benchmarks is linked to differing assumptions around the role of land sequestration CDR, possible demand-side shifts related to diets, and certain measures' technical potential. In 1.5°C-aligned pathways, global residual emissions mainly persist in the food and agriculture sector, since reducing to zero emissions is not feasible with today's known technologies and methods. Land sequestration CDR plays an important role – on a global scale – to get the sector's emissions to net zero, but what roles emission reductions and removals should play in companies' climate strategies remain unclear.

Key actions and measures for the food and agriculture sector

Measures to reduce methane emissions and emissions from livestock

Reduce animal-source food and increase plant-rich foods in diets

Critical transitional measure

The most immediate measure to reduce livestock methane emissions due to enteric fermentation is a significant shift in protein consumption in high-consuming regions away from animal-based towards plant-based and alternative proteins with lower environmental impacts. It also frees up land, currently used for livestock systems, to be used for more carbon efficient uses without affecting food security (Reisinger *et al.*, 2021). Literature provides various levels of reduction in meat and dairy consumption: Roe *et al.* (2021, p. 825) describe a 50% adoption of plant-based diets by 2050, while Boehm *et al.* (2023, p. 125) illustrate that to be 1.5°C compatible, ruminant meat consumption needs to reduce from 91 kcal/capita/day in 2020 to 60 kcal/capita/day in 2050, reducing overall consumption by 24%. Reducing animal-based food consumption by only 10% would nearly eliminate net cropland expansion (Searchinger *et al.*, 2019, p. 80). While the shift to plant-based protein comes with many benefits, there are also social, economic, and cultural challenges related to it. It must entail a just transition for livestock farmers, as roughly 1.3 billion livelihoods depend on livestock systems (Reisinger *et al.*, 2021). Companies play a crucial role in influencing the availability, affordability, convenience and desirability of certain foods and the market for plant-based foods presents a strong business case (Searchinger *et al.*, 2019, pp. 92–94; Bloomberg Intelligence, 2021).

Reduce emissions from livestock

Enabling measure

Alongside the shift towards more plant-based diets, enabling measures to reduce the emissions of livestock directly are needed to already start reducing the emissions intensity. Existing measures include increasing feed quality, increasing meat productivity, and manure management. Novel technologies could help achieve further supply-side methane emissions reductions if cost and R&D constraints are overcome. These technologies include synthetic methane inhibitors, a methane vaccine (pending proof of concept), low-emissions breeding and the use of seaweed as a feed additive (Reisinger *et al.*, 2021, p. 7).

Measures to reduce emissions from the production of food (upstream scope 3)

Global GHG emissions intensity of agricultural production need to decline by 31% by 2030 and 56% by 2050 relative to 2017 levels (Boehm *et al.*, 2023, p. 126).

Removal measure: increase soil health for enhanced carbon sequestration

Critical transitional measure

Alongside deep emissions reductions, the interest in the potential for soil carbon sequestration on working agricultural lands to remove emissions is growing. The potential mitigation impact of soil carbon sequestration can be significant (Costa *et al.*, 2022), but the potential and its feasibility are still debated among researchers (Boehm *et al.*, 2023, p. 126). The practices to increase carbon sequestration are often called 'regenerative' and include a range of measures such as erosion control, use of larger root plants, reduced tillage, restoration of degraded soils, and agroforestry (Roe *et al.*, 2019, p. 825). Such practices can improve soil health, increase biodiversity, and reduce reliance on chemical inputs and pesticides while maintaining agricultural productivity in a changing climate (Boehm *et al.*, 2023, p. 126).

Added to the uncertainty and lack of data concerning soil carbon sequestration, 'regenerative' practices cannot replace other critical measures, especially regarding ruminant emissions. Recent studies show that reducing emissions intensity for ruminants through soil carbon sequestration is overly optimistic (Wang *et al.*, 2023). Hence, emission reduction measures remain of the upmost importance; it is most appropriate to adopt separate emission reduction and emission removal.

Sustainably increase crop and livestock productivity on existing agricultural land

Critical transitional measure

More food and feed needs to be produced on existing agricultural lands while lowering the emissions intensity of agricultural production (Boehm *et al.*, 2023, p. 124). Productivity can be increased through a range of measures. Some measures such as agroforestry can lead to increased crop yield compared to conventional farming methods on top of other positive ecological impacts (Kuyah *et al.*, 2019). When increasing productivity sustainably, the need to depend on emerging and uncertain measures, such as carbon sequestration, decreases (Costa *et al.*, 2022, p. 5).

Shift away from the use of fossil fuels in the food and agriculture supply chain

Enabling measure

The current food system is responsible for approximately 30% of the world's energy consumption (T. C. Liu *et al.*, 2023, p. 4). Scaling renewable energy, enhancing fuel efficiency, electrifying transport fleets, and improving synthetic fertiliser production are all necessary measures for shifting the current food systems away from fossil fuels. Nitrogen fertiliser production and use represent approximately 5% of global GHG emissions (Gao and Serrenho, 2023).

Measures to reduce food loss and waste (upstream and downstream scope 3)

Reduce the share of food production lost or wasted by 50% by 2030 compared to 2016 levels, and maintain these levels through 2050

Critical transitional measure

About 24% of food is lost or wasted between production and consumption each year, causing unnecessarily higher levels of production and landfill emissions (Searchinger *et al.*, 2019, p. 52; Boehm *et al.*, 2023, p. 124). Therefore, reducing food loss and waste is a crucial measure to limit the growth in demand for agricultural goods (Boehm *et al.*, 2023, p. 124). Food loss occurs during the production, post-harvest and processing stages, whereas food waste occurs when safe food is discarded from the retail store to the point of intended consumption (Searchinger *et al.*, 2019, p. 53). Corporations play an important role as a lot of downstream consumer waste takes place in restaurants and retail markets, not just homes. Companies can fight food loss by engaging with their suppliers to reduce waste and implementing food loss and waste programs (Boehm *et al.*, 2023, p. 138). Food waste can also be reduced through improvements to infrastructure or innovative methods to sell food that would otherwise be wasted (Clark *et al.*, 2020).

Reduce emissions from cooling and refrigeratio (scope 1 for food retailers, scope 3 for food producers)

Reduce the use of HFCs and switch to climate friendly refrigerants

Enabling transitional measure

In order to avoid food losses and waste while global temperatures are rising, refrigeration will be increasingly important. Currently, the most commonly used refrigerants are hydrofluorocarbons (HFCs), which have high global warming potentials (Roberts, 2017). About 40% of refrigerant and cooling emissions can be avoided by 2030 by using low global warming potential natural refrigerants (Green Cooling Initiative, 2015, p. 7). Alternative refrigerants with low or zero global warming potential are available on the market but currently face financial and technical challenges to rapid uptake (Boehm *et al.*, 2023, p. 55).

8.3 Danone

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Food and Agriculture	USD 29.1 bn (2022)	25.7 $MtCO_2e$ (2022)	Net-zero emissions by 2050	Moderate	Moderate

1 TRACKING AND DISCLOSURE OF EMISSIONS

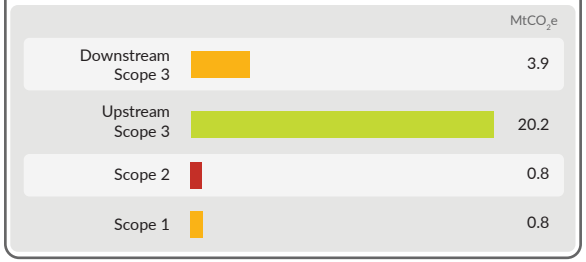
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 25.7 $MtCO_2e$ in 2022

Major emission sources: Almost 80% of emissions from upstream scope 3, 76% from purchased goods and services. Downstream transportation second most important (10%).

Disclosure: Consistent reporting and disclosure, but several scopes not accounted for and further breakdown of sources would be beneficial for better understanding. Scope 2 market-based used for total emissions.

Subsidiary coverage: Subsidiaries are only partially covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	***Net-zero emissions by 2050***		
Short-term targets (up to 2030)	*Reduce absolute scope 1 and 2 emissions 47.2% by 2030 (2020 baseline), absolute scope 1 and 3 FLAG emissions 30.3%, scope 3 non-FLAG 42, methane emissions from fresh milk 30%.*	◐	◕
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	30% by 2030		
	2030 targets may be 1.5°C aligned for some key emission sources, but targets do not cover all emissions, so translate to a 30% reduction of 2019 value chain emissions. Danone has a methane target, but provides no baseline emissions, so could not be quantified.		
Medium-term targets (2031 - 2040)	*No target identified.*	○	○
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
	No target identified.		
Longer-term targets (2041 - onward)	*Net zero emissions across the value chain by 2050.*	◔	◑
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	62.7% by 2050		
	The net-zero target does not cover all emissions. It is not accompanied by an explicit emission reduction commitment, but an estimate for residual emissions implies significant emission reductions.		

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	3% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	3% of 2022 emissions	Very limited public reporting on RE procurement. Majority comes from low-quality constructs. No information on planned constructs identified.	◔	◔
Upstream emissions (scope 3)	79% of 2022 emissions	Several measures identified for deep reduction of emissions, most notably a plan to increase share of plant-based protein. Emission reduction strategy includes short-term and longer-term measures.	◐	◕
Downstream emissions (scope 3)	15% of 2022 emissions	Limited detail on measures related to downstream emissions.	◔	?

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	Mitigation beyond value chain through "Livelihoods Funds". €68.8 M invested in period 2011-2023, partially in return for product level carbon neutrality claims. Since 2023, an undefined volume of support continues without offsetting claims.	◔	◔
Misleading offseting claims today	Carbon neutral production sites based mostly on a combination of RECs and carbon credits.	◔	○
Approach to residual emissions	Definition of residual emissions unclear due to the exclusion of significant volumes of emissions in the scope of the net zero target. Neutralisation plans include land sequestration CDR and other carbon capture technologies.	◔	?

5-point rating scale: ● High ◕ Reasonable ◐ Moderate ◔ Poor ○ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Danone (2020, 2023a, 2023b)*

Danone

Danone S.A. is a French corporation that mainly produces dairy and dairy products. The largest share of its emissions occurs in scope 3, with purchased goods and services, mainly related to milk and dairy ingredients, accounting for 75% of its value chain emissions in 2022. Danone has a net-zero target for 2050 and committed to emissions reductions of 34.7% by 2030. Due to a limited scope coverage, the latter target translates to emission reduction of 30% compared to the full value chain emissions in 2019. This is almost in line with 1.5°C-aligned benchmarks for the sector. Furthermore, the company plans to increase its share of plant-based protein production and has a target to reduce its methane emissions by 30% by 2030.

Though some emission sources are not covered by Danone's targets, the company's short-term targets reflect the need for a rapid emission reduction in the sector. Danone has emission reduction targets for 2030 that cover a selected share of emissions: some minor scope 3 emissions categories are excluded, summing to roughly 5.7 $MtCO_2e$, equivalent to 20% of 2019 value chain emissions (Danone, 2020a, pp. 73–90, 2023b, p. 14). Besides presenting the baseline emissions and absolute targeted emission levels, the company does not make the scope exclusion explicit in its latest *Climate Transition Plan*, which limits the transparency of Danone's climate strategy. Danone's short-term climate strategy includes various targets, with different levels of ambition for different emission sources (Danone, 2023b, p. 16). When assuming the excluded emission sources remain constant until 2030, the company's targets translate to 30% of emission reductions by 2030, compared to 2019 reported value chain emissions. With this, Danone's targets are almost in line with 1.5°C benchmarks for the food and agriculture, but the company could improve the transparency around excluding a share of emissions *(see Annex II)*.

Although Danone does not have an emission reduction target as part of its net-zero target, the company estimates that its residual emissions will be 4.5 $MtCO_2e$ in 2050 and wants to "neutralise" those with carbon credits or 'insetting' (Danone, 2023b, p. 38). The estimated residual emissions imply emission reductions of roughly 80%, compared to its 2020 baseline emissions. When comparing to 2019 value chain emissions, assuming the aforementioned emissions outside the target's coverage stay at a constant level of 5.7 $MtCO_2e$, the emission reductions are roughly 64%. Danone describes that it will either purchase carbon credits to reach net zero, or realise land sequestration carbon dioxide removals through own projects (which is also referred to as 'insetting' by others) (Danone, 2023b, p. 38). Danone does not describe in much detail what kind of projects it will depend on, but mentions land sequestration carbon dioxide removals and carbon capture without further specification (Danone, 2023b, p. 38). Nonetheless, the implied plan for emission reductions of roughly 64% would be almost in line with sectoral benchmarks for the food and agriculture sector.

In its *Climate Transition Plan*, Danone presents potentially comprehensive emissions reduction measures, including plans to increase the share of plant-based protein (Danone, 2023b, pp. 18; 35). This measure strengthens the integrity of Danone's longer-term climate strategy. Since the implementation of Danone's planned measures for the short-term would mean reaching the technical and physical limitations of methane reductions in the livestock sector without reducing dairy production, increasing the share of plant-based protein is a crucial additional measure to reach deeper levels of emission reductions (Reisinger *et al.*, 2021). Danone describes the importance of dairy for "healthy, sustainable and accessible diets" (Danone, 2023c, p. 4), but also highlights its plans to further increase the share of plant-based and low-carbon products (Danone, 2023b, pp. 35–36). Our current understanding of Danone's goal to make low-carbon products its main source of business is that it entails a reduction in livestock and absolute dairy production, but Danone could clarify this further. Given the uncertainty, the developments regarding Danone's dairy production and livestock volumes need to be closely monitored. By increasing the share of plant-based protein production, the company creates an opportunity to transition away from an emissions-intensive business model and to achieve deeper emission reductions in the longer term.

Danone's climate strategy includes a target to reduce methane emissions related to fresh milk production by 30%, compared to 2020 levels (Danone, 2023c, p. 3). Danone is a signatory to the Global Methane Pledge, and even though the company does not report on methane emissions yet, it is commendable that Danone is one of the first major agrifood companies to set a target for reducing methane emissions, which is one of the most challenging and critical emission sources of the sector (Reisinger *et al.*, 2021). During COP28, Danone pledged to start reporting on its methane emissions in 2024 (Douglas, 2023).

8.4 Mars

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Food and Agriculture	USD 45 bn (2022)	30.9 $MtCO_2e$ (2022)	Net-zero GHG emissions by 2050 in full value chain.	Moderate	Moderate

1 TRACKING AND DISCLOSURE OF EMISSIONS

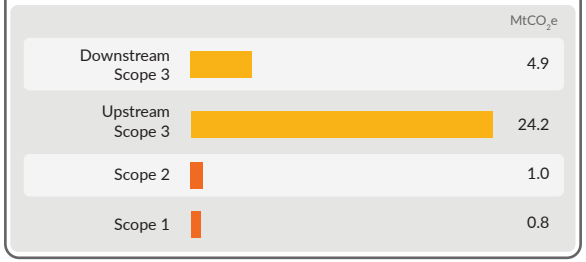
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 30.9 $MtCO_2e$ in 2022

Major emission sources: 94% of 2022 emissions occurred in scope 3; 73% from purchased goods and services (mainly agriculture and land-use change), 16% from downstream transportation.

Disclosure: Mars annually reports to CDP, but does not disclose in public-facing reporting annually. Its Net Zero Roadmap has a breakdown of emissions, but not using conventional reporting standards.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

TRANSPARENCY | INTEGRITY

Headline target or pledge: ***Net-zero GHG emissions by 2050 in full value chain.***

Short-term targets (up to 2030): *Reduce value chain emissions by 27% by 2025 and 50% by 2030 (2015 baseline).*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): 50% by 2030

Main emission reduction target (50% by 2030) is transparantly presented and in line with sectoral and global benchmarks. Carbon sequestration is not considered as part of target.

Medium-term targets (2031 - 2040): *No target identified*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): N/A

No target identified.

Longer-term targets (2041 - onward): *Net-zero emissions by 2050*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): 80% by 2050

Long-term net-zero target includes an emission reduction of 80%. Although this is aligned with sectoral benchmarks, role of biological CDR remains uncertain. With 50% from 2030, target is already in line with sectoral benchmarks.

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	3% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	3% of 2022 emissions	Mars pursues some high-quality RE procurement constructs, but public reporting is limited and the coverage of the target unclear.		
Upstream emissions (scope 3)	78% of 2022 emissions	Some critical measures are presented, that - in sum - will bring the emissions in line with 2030 target. Post-2030 emission reduction strategy is lacking.		
Downstream emissions (scope 3)	16% of 2022 emissions	No measures identified that can reduce emissions of this scope.		

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*		
Misleading offseting claims today	Carbon neutrality claims for specific brands. Information insufficient to determine the integrity of the claims.		?
Approach to residual emissions	Net-zero target includes neutralisation of residual emissions equal to 20% of 2019 emissions. Limited further details.		

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Mars (2023a, 2023b, 2023c)*

Mars

Mars Incorporated, headquartered in the US, is a private company that produces confectionary and pet food and provides animal care services. Almost three-quarters of reported emissions occur in upstream scope 3, mainly from agriculture and land-use change. Mars has a net-zero target for 2050 which includes an emission reduction commitment of 80%, and a 2030 emission reduction target of 50%. The company presents its 2030 target with a range of emission reduction measures that appear aligned with the targeted level, independent of measures for land sequestration carbon dioxide removals. Mars's ambition in the short-term is in line with 1.5°C-benchmarks, but the company does not present an emission reduction strategy for after 2030. More details on its net-zero strategy as well as regular reporting would improve the transparency of the company's climate plans.

Mars's targets up to 2030 are in line with sectoral and global 1.5°C-aligned benchmarks. Mars has emission reduction targets for 2025 and 2030 of 27% and 50% respectively, compared to 2015 levels (Mars, 2023d, p. 12, 2023c, p. 8). These targets also translate to 27% and 50% compared to 2019 value chain emissions and are in line with benchmarks for the global food sector *(see Annex II)*. They signal the need for a rapid decrease in Mars's value chain emissions and represent commitments to real emission reductions: the company explicitly states that the targets do not depend on offsets or carbon sequestration on farms (Mars, 2023c, p. 26). The company does support enhanced land sequestration carbon dioxide removal (CDR), but states it will not use those removals for target realisation (Mars, 2023a). By providing this explicit clarification and confirming the integrity of its ambition, Mars acknowledges the current accounting limitations of CDR and prioritises deep emission reductions over contentious removal claims, while other companies are extensively counting on land sequestration CDR towards their more ambiguous targets.

In its net-zero roadmap, Mars presents a diverse set of emission reduction measures until 2030, which appear in line with the targeted emission levels. The presentation of measures is moderately transparent and well-structured. Mars presents the emission reduction potential of seven emission sources and divides them into 21 emission reduction measures (Mars, 2023c, pp. 25–32). The company presents a business-as-usual scenario and targeted emissions of each emission source, as well as the emission reduction potential of each measure. However, the descriptions of measures are generally vague and often lack detail. Acknowledging that its deforestation-related emissions are significant, Mars describes the most significant reductions for agriculture and land-use change, with halting deforestation related to cocoa production being the most important measure (Mars, 2023c, p. 28), accounting for almost a quarter of the total emission reduction potential. Increased use of renewable electricity across Mars's value chain also plays a significant role in the company's strategy (Mars, 2023c, pp. 25–33), which accounts for almost a fifth of the total emission reduction potential, mainly to reduce scope 3 emissions. Mars presents emission reduction measures that can – in total – reduce the company's value chain emissions by more than the desired 50% by 2030 (Mars, 2023c, pp. 25–32).

It remains unclear how Mars plans to reduce emissions further after 2030. Although Mars's strategy until 2030 appears to be aligned with 1.5°C benchmarks, significant gaps remain for after 2030, both in terms of emission reduction measures as well as targets. The measures that Mars presents appear to have limited emission reduction potential beyond 2030; deeper emission reductions would be dependent on the implementation of other measures, which may be very difficult to implement at a later stage if not already planned for now. For example, Mars does not present any plans to meaningfully reduce emissions related to dairy production (Mars, 2023c, p. 27), which likely makes up a substantial part of the agricultural emissions. This emission source requires the initiation of a transition soon, in order to ensure deep emission reductions by 2050. More information on Mars's longer-term emission reduction strategy is needed for a thorough and fair assessment of the company's 2050 target.

Mars's net-zero target is substantiated with an 80% emission reduction target, but potential reliance on land sequestration CDR leaves the integrity of this target unclear. By specifying that the net-zero target means a reduction of at least 80% of its value chain emissions, Mars indicates a long-term ambition that could be in line with sectoral benchmarks (Mars, 2023c, p. 9). However, while Mars rules out the use of CDR towards its 2030 targets, the company does not specify whether CDR could play a role in achieving the 80% of emission reductions by 2050. Still, if Mars maintains its planned reductions of 50% until 2050, the emission reductions might be in line with sectoral benchmarks, regardless of the use of CDR.

Renewable electricity is key to Mars's emission reduction strategy, mainly to reduce scope 3 emissions, but the company only provides little information on planned procurement constructs. Mars describes its ambition to include 100% renewable energy by 2040 (Mars, 2023d, p. 12), but also reports to have reached its limit for onsite wind and solar capacity (Mars, 2023c, p. 33). The company states that it plans to use more PPAs but does not provide any more details on this, nor on the measures it will take to support the use of renewable electricity in the supply chain (Mars, 2023c, p. 33). More information is needed to assess whether this will lead to real and meaningful emission reductions.

Mars does not regularly and publicly report on all of the most relevant sustainability indicators. Mars's disclosure of today's emission reduction practices and emissions is minimal. Its public-facing annual sustainability report does not include a disclosure of emissions or other relevant data (Mars, 2023d, pp. 12–15). Mars only disclosed its emissions in its one-time publication presenting its net-zero roadmap (Mars, 2023c, p. 10); it only reports thorough data on a regular basis through its non-public CDP responses. The lack of regular public-facing reporting limits a thorough understanding of the company's emissions trends and efficacy of existing and future emission reduction measures.

8.5 Nestlé

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Food and Agriculture	USD 98.8 bn (2022)	114.7 $MtCO_2e$ (2022)	Net-zero GHG emissions by 2050	Poor	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

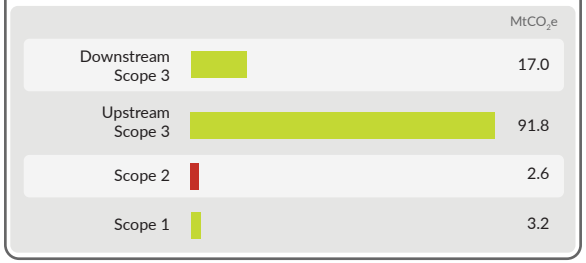
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 114.7 $MtCO_2e$ in 2022

Major emission sources: Main emissions are from agricultural activities and other purchased goods and services (72%).

Disclosure: Annual disclosure of emissions, with a breakdown provided in public-facing reporting. Only market-based emissions disclosed for scope 2.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

		TRANSPARENCY	INTEGRITY
Headline target or pledge	***Net-zero GHG emissions by 2050***		
Short-term targets (up to 2030)	*Reduce scope 1, 2 & 3 emissions by 20% by 2025. By 2030, reduce non-FLAG scope 1, 2 & 3 emissions by 50.4% and scope 3 FLAG emissions by 50%.*	◔	◔
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	16-24%		
	Updated SBTi FLAG-aligned targets. Limited emission reduction commitment based on targets and measures presented in Net Zero Roadmap, which includes a mix of land sequestration CDR and emission reductions.		
Medium-term targets (2031 - 2040)	*No target identified.*	◌	◌
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	N/A		
	No target identified.		
Longer-term targets (2041 - onward)	*Reduce non-FLAG scope 1, 2 & 3 emissions by 90% by 2050 vs 2018; reduce absolute scope 3 FLAG GHG emissions by 75% by 2050 vs 2018*	◔	?
Scope coverage	S1, S2, S3↑, S3↓		
Own emission reductions (compared to full value chain in 2019)	?		
	Undefined role of CDR for net-zero target and updated SBTi targets.		

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	3% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	2% of 2022 emissions	Renewable electricity procurement constructs account for 77% of consumption, 41% through PPAs. Disclosure of information only in CDP responses.	◔	◑
Upstream emissions (scope 3)	80% of 2022 emissions	Some measures to reduce upstream s3 emissions identified, but includes uncertain measures such as regeneration. Lacks clear commitments to measures that will lead to deep emission reductions.	◔	◔
Downstream emissions (scope 3)	15% of 2022 emissions	No measures identified that meaningfully address downstream scope 3.	◌	◌

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	◌	◌
Misleading offseting claims today	Nestlé has discontinued its carbon neutrality claims for brands, but the company subtracted carbon dioxide removals from its reported emissions in 2022.	◔	◔
Approach to residual emissions	All targets depends on 'neutralisation' and 'insetting' using land sequestration CDR. Limited details are provided.	◔	?

5-point rating scale: ● High ◕ Reasonable ◑ Moderate ◔ Poor ◌ Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Nestlé (2023a, 2023b, 2024)*

Nestlé

Switzerland-based Nestlé S.A. (Nestlé) is the world's largest food and beverage company by revenue, with brands such as KitKat, Nesquik, and Nespresso. The biggest share of Nestlé's emissions is related to agricultural activities. Nestlé commits to reaching net-zero GHG emissions by 2050, and published new targets aligned with the Science Based Targets initiative (SBTi) Forest, Land and Agriculture (FLAG) guidance in 2023. Although these updates could mark an improvement in Nestlé's climate strategy, Nestlé's targets remain potentially misleading and ambiguous due to an unspecified amount of land sequestration carbon dioxide removals within the value chain, referred to as "carbon scope 3 removals". Nestlé did not publish updated baseline emissions for its 2030 target, so we continue to interpret that the pledge to reduce emissions by 50% by 2030 translates to emission reductions of just 16–24% based on measures presented in its Net Zero Roadmap, which does not include clear plans for the deep decarbonisation of agricultural emissions.

Key developments over the past year: Nestlé updated its 2030 and 2050 net-zero pledge since the previous iteration of this analysis in February 2023 (Day, Mooldijk, Hans, *et al.*, 2023), aligning its pledge with the SBTi FLAG guidance (SBTi, 2022a). These updates represent only minor changes compared to the information previously assessed. Hence, we did not identify any improvements on the key issues that undermine Nestlé's climate strategy.

Nestlé's emission reduction pledges may be misleading. We interpret that the pledge to reduce emissions by 50.4% by 2030 translates to only 16–24% emission reductions compared to the company's emissions in 2019. Nestlé's SBTi-certified targets include emission reduction targets of 20% by 2025 and 50.4% by 2030, with 2018 as a base year, which marks a very slight increase from its previous 50% target. The company now presents a separate 50% reduction target in FLAG emissions by 2030 (SBTi, 2023e; Nestlé, 2024, p. 12). In its Net Zero Roadmap, Nestlé presents its interim emission reduction targets for each emission source compared to a business-as-usual scenario, showing the targeted emission levels for each emission source for 2030 (Nestlé, 2023b, p. 4). We calculate from the figures presented in the company's Net Zero Roadmap that its commitments translate to just a 16% reduction of the company's full value chain emissions in 2019, or a maximum of 24% under the most optimistic interpretation *(see further details on the target and this calculation in Annex II)*.

Nestlé's 2050 net-zero pledge remains ambiguous due to limited scope coverage and an unspecified role of land sequestration carbon dioxide removals. Based on the company's Net Zero Roadmap, we have calculated that Nestlé's 2050 net-zero pledge covers 81.4% of Nestlé's 2018 emissions footprint (Nestlé, 2023b, pp. 6–8). However, it is not clear if this can be the right baseline, since this would in theory fall short of SBTi requirements for net-zero targets to cover at least 90% of a company's emissions. Nestlé did not publish its updated baseline emissions for 2018 alongside its new SBTi FLAG targets, but does present the covered emissions of more recent reporting years in its latest sustainability report (Nestlé, 2024, p. 8). The company does not provide a comparison with full value-chain emissions of 2018. The updated net-zero pledge now includes a 90% emissions reduction commitment for industry- and energy-related emissions and a 75% emission reduction target for FLAG emissions by 2050 (Nestlé, 2024, p. 12), but the latter includes an undefined role for land sequestration carbon dioxide removals (CDR). Further clarification on the role of land sequestration CDR is needed to understand whether the 2050 pledge represents a commitment that will lead to permanent, deep emission reductions. This is particularly relevant given the extensive role for CDR vis-à-vis emission reductions in the company's plan for implementing its 2030 target.

Nestlé states that it "will not rely on offsetting" (Nestlé, 2023a, p. 12) and does not refer to 'insetting' anymore, but will rely on land sequestration CDR for its target realisation and makes emission removals claims today. Although the company says it will not rely on offsetting for target realisation, it also describes that Nestlé's brands do purchase carbon credits for their "consumer engagement strategy", without specifying what exact claims are being made with those (Nestlé, 2023b, p. 41). Without further information on the volume and projects supported as well as the claims being made, it is not clear whether this alternative approach constitutes credible climate contributions or a repackaging of potentially misleading claims with new terminologies. The company continues to claim the neutralisation of emissions through land sequestration CDR taking place within its value chain in its public-facing documents, though to a lower extent. Nestlé claimed to have removed 4.3 $MtCO_2e$ in 2022 (Nestlé, 2023a, p. 12), but presents removals of only 0.76 $MtCO_2e$ in 2023 (Nestlé, 2024, p. 7). The company no longer describes removals as 'insetting', but as "carbon scope 3 removals" and "natural climate solutions" (Nestlé, 2023b, pp. 20, 39–41, 45). The company presents plans to remove 25.2 $MtCO_2e$ of land sequestration CDR by 2030: 13 $MtCO_2e$ through undefined "carbon scope 3 removals", and 12.2 $MtCO_2e$ land sequestration CDR measures presented alongside emission reduction measures (Nestlé, 2023b, pp. 14, 19). This volume equates almost a quarter of 2018 value chain emissions.

Nestlé's plans do not include sufficiently transformational measures to achieve deep decarbonisation of agricultural emissions in the long run. The majority of Nestlé's GHG emissions derive from upstream agricultural activities. The agriculture sector faces major challenges for decarbonisation; existing technologies and measures to mitigate the emissions intensity of many agricultural products have limited potential, especially for the livestock sector, which accounted for a quarter of Nestlé's reported emissions in 2023 (Nestlé, 2024, p. 7). Although Nestlé's range of emission reduction measures are expected to lead to a respectable 48% reduction of manufacturing emissions by 2030, they will reduce emissions from dairy, livestock, soil, and forests, which are far more significant emission sources, by just 6% between 2018 and 2030, excluding measures to claim that emissions are offset through land sequestration CDR (Nestlé, 2023b, pp. 14, 19, 20). These emission sources represent the most significant challenge for agri-businesses. It is not credible for agri-businesses to claim that they are on a path to deep decarbonisation without major innovations to drastically reduce the emissions footprint of livestock agriculture or diversifying away from this highly GHG emissions intensive industry.

8.6 Tesco

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Food and Agriculture	USD 67.8 bn (2022)	77.5 $MtCO_2e$ (2022)	Net zero by 2050 across the full value chain	Poor	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

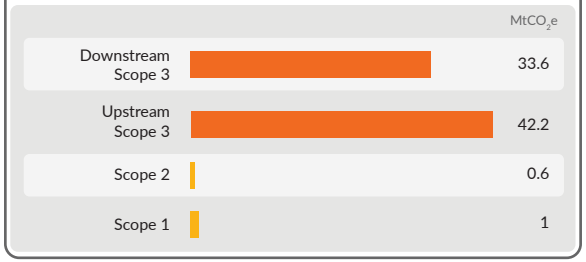
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 77.5 $MtCO_2e$ in 2022

Major emission sources: ~50% of reported emissions are related to purchased goods and services, and ~40% to use of sold products (though unclear what this entails).

Disclosure: A major share of scope 3 emissions is omitted frome some GHG inventory tables in public-facing reporting.

Subsidiary coverage: Subsidiaries are only partially covered in the emissions reporting and disclosure. It remains unclear to what extent subsidiaries are currently covered.



2 SETTING EMISSION REDUCTION TARGETS

TRANSPARENCY | INTEGRITY

Headline target or pledge: ***Net zero by 2050 across the full value chain.***

Short-term targets (up to 2030): *Reduce scope 1 & 2 by 60% by 2025 and by 85% by 2030 (2015 baseline).*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): 1% by 2030

Transparent short-term targets, but cover only a very small share of emissions. No meaningful scope 3 targets before 2032.

Medium-term targets (2031 - 2040): *Reduce scope 3 energy & industrial emissions by 55% by 2032 (2019 baseline), reduce scope 3 FLAG emissions by 39% by 2032 (2019 baseline). Net zero scope 1 and 2 by 2035.*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): 27-45% by 2032

Medium-term targets that could translate to deep emission reductions, but major scope exclusions that are not presented in public-facing documentation. Undefined role of CDR that could undermine targets.

Longer-term targets (2041 - onward): *Net zero across value chain by 2050. Reduce non-FLAG scope 3 emissions by 90% by 2050 (2019 baseline), and scope 3 FLAG by 72% by 2050 (2019 baseline).*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): 63-74% by 2050

Net-zero target, presented with emission reduction targets. Scope exclusions not presented in public-facing documentation. FLAG targets integrity unclear, as role of CDR is undefined. Non-FLAG targets are sufficient.

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	1% of 2022 emissions	*Not assessed.*	N/A	N/A
Renewable electricity (scope 2)	1% of 2022 emissions	Limited level of detail on electricity consumption in public-facing documentation. Claim of 100% RE consumption today; ~90% of demand is met with RECs.	Poor	Very poor
Upstream emissions (scope 3)	55% of 2022 emissions	Little to no measures identified that meaningfully reduce upstream scope 3 emissions.	Poor	Very poor
Downstream emissions (scope 3)	43% of 2022 emissions	Plans to reduce emissions from downstream transport. No further measures identified that can meaningfully reduce emissions in this scope.	Very poor	?

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	*No climate contributions identified.*	Very poor	Very poor
Misleading offseting claims today	*No offsetting claims identified.*	N/A	N/A
Approach to residual emissions	No information provided on how emissions will be neutralised towards net-zero claims in the future.	Very poor	?

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Tesco (2023a, 2023b, 2024)*

Tesco

Tesco PLC is a UK-based groceries multinational and general retailer. Almost 90% of Tesco's emissions occur in scope 3: roughly 50% of its emissions footprint is related to purchased goods and services, mainly stemming from the production of the products the retailer sells, and almost 40% from the use of its sold products. Tesco's headline pledge is to reach net-zero emissions across its value chain by 2050. In the short term, the company mainly focuses on scope 1 and 2 targets, which will not lead to meaningful reductions in its value chain emissions. Moreover, partial exclusions of scope 3 emissions in its short- and medium-term targets are not transparently communicated. Tesco's long-term targets for non-FLAG emissions appear reasonably ambitious, but the company does not specify the potentially significant role of land sequestration carbon dioxide removals for its FLAG targets. It remains unclear how the company plans to realise these targets: its emission reduction strategy lacks detail and the presented measures are unlikely to lead to deep emission reductions.

Tesco focuses disproportionally on scope 1 and 2 in its emission reduction strategy and emissions disclosure; the company does not have any targets that will lead to deep emission reductions in the short term. The most important reason for the latter is that Tesco does not have any emission reduction targets for scope 3 before 2032 (Tesco, 2024). Tesco's climate strategy until 2030 focuses on scope 1 and 2, whereby these scopes account for only 2% of value chain emissions (Tesco, 2023a, pp. 103–115). This focus is also reflected in the company's public-facing emissions disclosure, where less than 1% of scope 3 emissions are presented – covering only emissions related to business travel and a selected share of transport and distribution (Tesco, 2023b, pp. 19; 23). Tesco's targets until 2030 translate to emission reductions of 1% by 2030, compared to 2019 value chain emissions.

Tesco's emission reduction targets for the medium-term cover only a share of total emissions, which is not transparently communicated. Tesco's targets are to reduce non-Forest, Land, and Agriculture (FLAG) scope 3 emissions by 55% and FLAG-related emissions by 39%, by 2032 and compared to a 2019 baseline (Tesco, 2024). However, Tesco covers only 67% of baseline emissions with both targets (Tesco, 2023a, pp. 47–58). Due to these scope exclusions, we estimate that Tesco's targets would translate to emission reductions somewhere in the range of 27-45% compared to 2019 value chain emissions. Tesco specifies the scope exclusions only in its CDP disclosure and not in its public-facing communication on its climate strategy (Tesco, 2023a, pp. 47–60). The public-facing targets imply a higher level of ambition than they entail in reality.

Tesco presents its emission reduction plans with a very limited level of detail, and it is not clear how the presented measures can lead to deep emission reductions. The company presents only a few emission reduction measures in broad terms, and the measures that target scope 3 mainly put the responsibility with others. Tesco hopes that suppliers and consumers will undertake extensive action, without indicating intent to provide extensive support or requirements (Tesco, 2023b, p. 24). Currently, the company shows little to no commitment to implementing emission reduction measures that would be of high relevance for a retailer with significant FLAG emissions, such as commitments to increase the share of plant-based protein sales or a deforestation-free supply chain Tesco describes measures to improve health- and biodiversity-related aspects of its environmental impact more extensively on its climate change webpage (Tesco, 2024). The company states it will publish a transition plan in 2024 (Tesco, 2023a, p. 73).

Tesco presents emission reduction commitments of 72% and 90% for FLAG and non-FLAG emissions respectively alongside its net-zero pledge (Tesco, 2024), where the latter represents a reasonable level of ambition, but the former remains ambiguous. Since Tesco's non-FLAG emissions account for almost two-thirds of its emissions footprint, a large share of its emissions is subject to the reasonably ambitious 90% emission reduction target. For the FLAG emissions, however, we find that the limited scope coverage and likely dependence on land sequestration carbon dioxide removals, as explicitly allowed in SBTi's FLAG guidance, reduces the potential emission reduction commitment substantially. As for Tesco's medium-term targets, the targets' baseline emissions of scope 3 categories 3 (fuel and energy-related activities) and 11 (use of sold products) differ significantly from the emissions reported elsewhere. Scope exclusions and the related transparency issues lead us to estimate that the targets translate to an emission reduction range of 63-74% in 2050. These estimates partially rely on an undefined role of land sequestration carbon dioxide removals that will reduce the real emission reduction commitment even further. Tesco claims that these targets are in line with SBTi's FLAG guidance and Net Zero Standard, but it remains uncertain whether the limited scope coverage is in line with the requirements presented in those guides.

8.7 Walmart

SECTOR	REVENUE	EMISSIONS	PLEDGE	TRANSPARENCY	INTEGRITY
Food and Agriculture	USD 611.3 bn (2022)	301.8 $MtCO_2e$ (2022)	Zero emissions across global operations by 2040.	Poor	Poor

1 TRACKING AND DISCLOSURE OF EMISSIONS

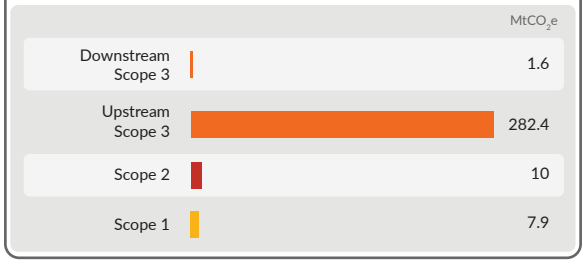
TRANSPARENCY & INTEGRITY

Tracking and disclosure: 301.8 $MtCO_2e$ in 2022

Major emission sources: Major emission sources are related to purchased goods and services (upstream scope 3, 95%).

Disclosure: In public-facing documentation, Walmart only reports on scope 1 and 2 emissions. Scope 3 emissions are only reported in CDP disclosure.

Subsidiary coverage: Subsidiaries are covered in the emissions reporting and disclosure.



2 SETTING EMISSION REDUCTION TARGETS

TRANSPARENCY | INTEGRITY

Headline target or pledge: *Zero emissions across global operations by 2040.*

Short-term targets (up to 2030): *Reduce scope 1 & 2 emissions by 35% by 2025 and 65% by 2030, compared to 2015 levels.*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): 5% by 2030

Short- to medium-term targets translate to 5% emission reductions compared to 2019 value chain emissions: this is not in line with 1.5°C-benchmarks.

Medium-term targets (2031 - 2040): *Zero emissions in operations by 2040.*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): 9% by 2040

Long-term target translates to 9% emission reductions, compared to 2019 value chain emissions. This is not in line with 1.5°C-benchmarks.

Longer-term targets (2041 - onward): *No target identified.*

- Scope coverage: S1, S2, S3↑, S3↓
- Own emission reductions (compared to full value chain in 2019): N/A

No target identified.

3 REDUCING OWN EMISSIONS

			TRANSPARENCY	INTEGRITY
Operational emissions (scope 1)	3% of 2022 emissions	Measures to reduce scope 1 emissions presented including changing refrigerants and electrifying transport, but only in vague terms.		
Renewable electricity (scope 2)	3% of 2022 emissions	Aims for higher-quality RE constructs to reach 100% RE by 2035, but RE share remains modest. Information only provided in CDP disclosure.		
Upstream emissions (scope 3)	94% of 2022 emissions	Significant categories of upstream scope 3 emissions addressed through supplier engagement programme, but information remains vague.		
Downstream emissions (scope 3)	1% of 2022 emissions	*Not assessed.*	N/A	N/A

4 RESPONSIBILITY FOR UNABATED AND RESIDUAL EMISSIONS

		TRANSPARENCY	INTEGRITY
Climate contributions today (Beyond-value-chain mitigation)	Commits to protect/restore 50 million acres of land by 2030, without neutralisation claim; reached 30 million acres in 2022. Very limited detail on emissions impact provided.		?
Misleading offseting claims today	*No offsetting claims today identified.*	N/A	N/A
Approach to residual emissions	Explicitly states that it will achieve its targets without carbon offsets, but does not have a target that covers scope 3 emissions.		?

5-point rating scale: High | Reasonable | Moderate | Poor | Very poor — **Transparency** refers to the disclosure of information. **Integrity** refers to the quality and credibility of the approach.

Sources: *Walmart (2020a, 2021a, 2022, 2023b, 2023a, 2023c, 2023d) and Schneider Electric (2022)*

Walmart

Walmart Inc. (Walmart) is a US-based retail corporation that operates grocery stores, department stores, and hypermarkets. Most of Walmart's emissions (94% of 2022 emissions) originate from the procurement of goods (upstream scope 3). Walmart has set targets to take responsibility for its operational scope 1 and 2 emissions. However, its strategy for upstream scope 3 emissions, which account for most of the company's overall climate impact, lacks a clear reduction commitment. Walmart sets no emissions reduction target for scope 3 emissions but rather builds on Project Gigaton, a programme in which Walmart engages with its suppliers to set targets and reduce emissions themselves voluntarily. Walmart does not have a separate target for FLAG emissions.

Key developments over the past year: We could identify only minor changes to Walmart's sustainability strategy since our previous analysis of the case study in the *2023 Corporate Climate Responsibility Monitor* (Day, Mooldijk, Hans, *et al.*, 2023). The company states it no longer anticipates reaching its 2025 emissions reduction target and does not provide an explanation for this setback, putting into question the credibility of its scope 1 and 2 emissions targets. Walmart has continued to increase the number of suppliers signed up to its Project Gigaton engagement programme to reduce upstream scope 3 emissions. Since the publication of its scope 1 and 2 SBTi targets in 2016, Walmart has made no progress in target ambition, despite the critical insufficiency of these targets in the context of the climate crisis now many years later. Accordingly, only minor modifications were made to this case study.

Walmart has not updated its highly insufficient targets since launching them in 2016; its targets still cover a negligible share of emissions. Walmart's headline target is to reduce its scope 1 and 2 emissions, referred to as 'operational emissions', to zero by 2040, complemented by interim targets for 2025 and 2030. The company does not seek to offset emissions and commits to sourcing 100% renewable energy in global operations (scope 1 and 2) by 2035 (Walmart, 2023b). Walmart has set interim emission reduction targets for its scope 1 and 2 emissions: reductions of 35% by 2025 and 65% by 2030, compared to a 2015 baseline (Walmart, 2022a, p. 28). The targets translate to approximately a 25% emission reduction from scopes 1 and 2 by 2025 and 60% by 2030, from a 2019 baseline. Including scope 3 emissions, the targets translate to only a 5% emission reduction by 2030 and 9% by 2050, compared to 2019 levels (Walmart, 2023c, p. 19). In addition to the very limited level of ambition embodied by these targets, their credibility is further called into question by Walmart's announcement in 2023 that it anticipates being unable to reach its 2025 target (Walmart, 2023b).

In 2017, Walmart launched Project Gigaton to address scope 3 emissions, which account for 94% of the company's emissions footprint, but the potential impact of the measures remains unclear. To address scope 3 emissions, the company launched its Project Gigaton in 2017. Through Project Gigaton, Walmart wants to engage suppliers, offering them guidance to reduce their emissions in six areas: energy, nature, product use and design, waste, packaging, and transportation (Walmart, 2023c, p. 20). Suppliers can sign up for the programme and receive access to resources and training that help them set their own targets and design strategies to tackle their emissions. The project includes key sector reduction measures such as sourcing 20 relevant commodities 'more sustainably' by 2025 using various certifications to guarantee the level of sustainability. However, it remains unclear what impact these measures will have on its scope 3 emissions (Walmart, 2023c, p. 18). Measures concerning renewable energy procurement under Project Gigaton are more transparent. To increase the share of renewable electricity in its supply chain, Walmart supports suppliers to access collaborative Power Purchase Agreements (PPAs) (Schneider Electric, 2022) *(see Section 3.2)*. Since 2017, around 5,200 suppliers have joined the programme (Walmart, 2023c, p. 20); while these suppliers account for 12% of all suppliers, they account for roughly 75% of US net sales (Walmart, 2023d, p. 96), an increase from last year's 4,500 suppliers (Walmart, 2022). With Project Gigaton, Walmart aims to reduce 1 $GtCO_2e$ in cumulative scope 3 emissions in the period between 2017 and 2030. The progress of Project Gigaton is measured through avoided CO_2e emissions, using a business-as-usual (BAU) scenario as a baseline (Walmart, 2023a, p. 4). Walmart notes that this approach for calculating progress does not align with GHG Protocol's Corporate Value Chain Standard. As we were unable to identify the variables included in Walmart's BAU calculations, we could not evaluate to what extent reported progress compares to real emissions reductions. Although Project Gigaton is presented as a central element of Walmart's sustainability strategy, the company did not commit to any targets for scope 3 emissions. How the cumulative emission reductions are aligned with a 1.5°C trajectory remains unclear.

Walmart's public-facing reporting neglects a large share of emissions; Walmart can improve its GHG emissions reporting to ensure transparency and accountability. In its public climate change strategy, the company does not disclose its scope 3 emissions, which account for 94% of the company's total emissions in 2022 (Walmart, 2023d, pp. 59–67). In its CDP disclosure, Walmart partially reports on its scope 3 emissions: a share of downstream scope 3 emissions are being recalculated (Walmart, 2023d). Furthermore, its main reporting of emissions from energy procurement (scope 2) uses a market-based accounting approach. This reduced energy procurement emissions by more than 3 $MtCO_2e$ in 2022 compared to a location-based accounting approach. Scope 3 and location-based scope 2 emission estimates are only included in Walmart's disclosure to CDP, which the company makes publicly accessible by publishing it on its website (Walmart, 2023d, pp. 56–67); not in its public-facing sustainability documentation.

Walmart commits not to use offsets to reach its target for zero operational emissions, while pledging to make a climate contribution to support nature-based solutions without claiming to neutralise its emissions. Walmart explicitly plans to reduce scope 1 and 2 emissions to zero by 2040, without the use of offsets (Walmart, 2021a). In parallel, Walmart and Walmart Foundation have committed to protect or restore 50 million acres of land by 2030, without linking this contribution to a neutralisation claim (Walmart, 2020a). This is an effective approach to supporting nature-based solutions for climate change mitigation outside of its value chain. However, Walmart could improve their transparency on these contributions by disclosing further information on how it determines the volume of support. It remains unclear whether this is linked to assuming responsibility for unabated emissions, particularly given that scope 3 emissions are not included in Walmart's main climate targets.

Glossary and abbreviations

Additional potential (of CDR)	See "*Scarcity (of CDR)*"
AFOLU	Agriculture, Forestry and Other Land Uses
BECCS	Bioenergy with carbon capture and storage
BEV	Battery electric vehicles
Biological capture and storage	See "*Nature-based solutions*".
BVCM	Beyond value chain mitigation (SBTi terminology; see *Climate contribution*)
CAR	Climate Action Reserve
CCS	Carbon capture and storage
CCU	Carbon capture and utilisation
Climate contribution	We define climate contributions as the financial support provided by a company to support climate change action beyond the company's own value chain, without claiming the neutralisation of its own emissions in return.
Carbon dioxide removals (CDR)	All scenarios consistent with a 1.5°C temperature increase include a major role for carbon dioxide removals.(Rogelj *et al.*, 2018) This includes nature-based solutions for carbon sequestration in forests, soils, peatlands and mangroves, technological solutions such as BECCS and DACCS with underground storage, and solutions with mineral storage.
Carbon credit	A carbon credit is a certified unit of a reduction of GHG emissions, or a removal of carbon dioxide (see *Carbon dioxide removals*). Companies sometimes used carbon credits to claim to balance out GHG emissions elsewhere.
CDM	Clean Development Mechanism
CDP	Formerly the Carbon Disclosure Project: Many companies report emissions as well as other details of their climate strategies to CDP. CDP provide companies with a certified rating of their level of climate transparency, which is often used in company's marketing materials.
CEO	Chief Executive Officer
CO_2	Carbon dioxide
COP	Conference of the Parties (see *UNFCCC*).
DACCS	Direct Air Carbon Capture and Storage, see also "*Carbon dioxide removals (CDR)*"
DRI-EAF	Direct reduced iron – Electric arc furnace
ESG	Environmental Social Governance
EU	European Union
EV	Electric vehicle
FLAG	Forest, Land and Agriculture Science Based Target Setting Guidance (a standard by the Science Based Targets initiative for land-based emissions disclosure and target setting).
GHG Protocol	The GHG Protocol is an initiative driven by the World Resources Institute and World Business Council for Sustainable Development, that provides international guidance and standards for GHG emissions accounting.
GHG	Greenhouse gas
Guarantees of origin (GOs)	Other terminology for Renewable Energy Certificates (REC), see *"Renewable Energy Certificates (REC)"*
HDV	Heavy-duty vehicle

High-hanging fruit	The high-hanging fruit of mitigation potential refers to the technologies and measures to decarbonise emission sources that remain otherwise entirely inaccessible to host country governments in the near- and mid-term future, on account of high costs or other insurmountable barriers that cannot reasonably be overcome.
HLEG	The United Nations' High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities
ICT	Information and communications technology
IEA	International Energy Agency
Insetting	'Insetting' is a business-driven concept used by a limited number of actors with no universally accepted definition. Insetting is often described as offsetting within the value chain. The approach can lead to low credibility GHG emission offsetting claims and presents a significant risk of double counting the same emission reductions.
Integrity (rating)	The *Corporate Climate Responsibility Monitor* assesses the transparency and integrity of companies' climate pledges. Integrity, in this context, is a measure of the quality, credibility and comprehensiveness of a company's approaches towards the various elements of corporate climate responsibility.
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
ISO	International Organisation for Standardisation
Land sequestration CDR	Measures for carbon dioxide removal that involve biological carbon capture and storage in natural ecosystems, such as soils, forests, peatland and mangroves.
LEV	Low-emission vehicles
LNG	Liquified natural gas

Location-based method (for scope 2 emissions accounting)	The location-based method for scope 2 emissions accounting reflects the average emission intensity of the electricity grid from which the consumer's energy is delivered.
Market-based method (for scope 2 emissions accounting)	The market-based method for scope 2 emissions accounting reflects the emissions from electricity generation specifically procured by the consumer (which may not reflect the electricity they actually consume from a grid that features multiple buyers and sellers). It derives emission factors from contractual renewable electricity procurement instruments.
Nationally determined contributions (NDCs)	Nationally determined contributions (NDCs) are the pledges made by national governments to the United Nations Framework Convention on Climate Change to mitigate climate change. The Paris Agreement requires all Parties to submit and regularly update their NDCs to represent their possible highest level of ambition. Recognising the insufficiency of climate change mitigation commitments in existing NDCs, the Glasgow Pact from COP26 urged all Parties to update their NDCs again ahead of COP27.
Neutralisation	Fundamentally, companies' plans to neutralise emissions towards net zero targets constitute a form of offsetting. Nevertheless, we recognise an emerging consensus that the terminology 'neutralisation' is differentiated by other forms of offsetting on the basis that it should apply only to residual emissions.
Non-GHG climate forcers	Non-GHG climate forcers include the emission of gases and aerosols, and processes that change cloud abundance, leading to radiative forcing. Radiative forcing is a change in the balance of radiation in the atmosphere, which contributes to global warming. For example, the non-GHG climate forcers are estimated to increase the climate impact of GHG emissions from the aviation industry by a factor of approximately 3 (Atmosfair, 2016).
Offsetting	*See carbon credits.*
Permanence (of CDR)	The *permanence* of a CDR outcome refers to the timescale and degree to which sequestered carbon remains stored and not released into the atmosphere.

Power purchase agreement (PPA)	A PPA is a long-term contract between an electricity provider and an electricity consumer, usually spanning 10-20 years. The consumer agrees to purchase a certain amount of electricity from a specific asset under a pre-determined pricing arrangement. PPAs are generally signed with new renewable energy installations and form part of the project investment decision (NewClimate Institute and Data-Driven EnviroLab, 2020). PPAs can also be signed for existing installations, in which case it is less likely the PPA results in additional renewable electricity capacity. However, it may be that existing installations would cease operations if the operator cannot sign a new PPA.
PV	Photovoltaics
R&D	Research & development
Renewable energy certificate (REC)	Renewable Energy Certificates (RECs) are also known under various names, such as Guarantees of Origin (GOs) or Energy Attribute Certificates (EACs). RECs can be acquired simply as an accounting tool alongside other renewable electricity procurement constructs, or may be procured as "standalone RECs". *Standalone RECs:* The procurement of RECs without any accompanying renewable electricity procurement construct, such as a PPA.
Residual emissions	Residual emissions are the remaining GHG emissions from hard-to-abate emission sources where no known feasible options remain for further decarbonisation. (See also *unabated emissions*)

Scarcity (of CDR)	The maximum potential of most carbon dioxide removal measures is technically limited, and even further restricted by environmental constraints. Due to issues such as land requirements, high water consumption, high energy consumption, land degradation and pollution, among other environmental costs, carbon dioxide removal technologies can only be scaled-up so far without significantly endangering sustainable development goals, including food security. The scarcity of carbon dioxide removals measures – in terms of their maximum absolute or annual technical potential – is an important consideration when evaluating the feasibility of net-zero claims at the level of individual actors. Robust future use of scarce carbon dioxide removal options must be consistent with achieving net-zero and eventually net-negative emissions at the global level, which is required to avoid the most damaging effects of climate change over the coming decades.
Science Based Targets initiative (SBTi)	SBTi reviews and certifies the climate targets of companies who join the initiative as members. Companies' climate targets are certified as 1.5°C or 2°C compatible if they align with SBTi's own methodology and benchmarks.
Scope (of GHG emissions)	The GHG Protocol Corporate Standard classifies a company's GHG emissions into three 'scopes' (WBCSD and WRI, 2004):
Scope 1 emissions	Scope 1 emissions are direct emissions from owned or controlled sources.
Scope 2 emissions	Scope 2 emissions are indirect emissions from the generation of purchased energy (see also *location-based method* and *market-based method*).

Scope 3 emissions	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 (GHG Protocol, 2013).
Upstream scope 3 emission sources	Upstream emissions are indirect GHG emissions related to purchased or acquired goods and services (GHG Protocol, 2013).
Downstream scope 3 emission sources	Downstream emissions are indirect GHG emissions related to sold goods and services (GHG Protocol, 2013).
Normal scope 3 emission sources	The GHG Protocol's Scope 3 Standard identifies 15 distinct reporting categories for scope 3 emission sources, and requires companies to quantify and report scope 3 emissions from each category (GHG Protocol, 2013).
Optional scope 3 emission sources (indirect use-phase emissions)	*Indirect use-phase emissions* are described by the GHG Protocol Scope 3 Standard (GHG Protocol, 2013) as an optional reporting component. In contrast to direct use-phase emissions from products, such as the energy consumption of vehicles and appliances, indirect use-phase emissions refer to the emissions that occur indirectly from the use of a product. For example, apparel requires washing and drying; soaps and detergents are often used with heated water.
Sustainable aviation fuels (SAF)	Sustainable aviation fuels are aviation fuels derived from renewables or waste considering certain sustainability criteria.
Transparency (rating)	The *Corporate Climate Responsibility Monitor* assesses the transparency and integrity of companies' climate pledges. Transparency ratings refer to the extent to which a company publicly discloses the information necessary to fully understand the integrity of that company's approaches towards the various elements of corporate climate responsibility.
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
Unabated emissions	Unabated emissions are GHG emissions from emission sources for which further emission reductions are technically feasible at that point in time. (See also *residual emissions*)
Value chain emissions	A company's full value chain emissions refers to the entirety of scope 1, scope 2, and scope 3 emissions.
US	United States
Value chain emissions	A company's full value chain emissions refers to the entirety of scope 1, scope 2, and scope 3 emissions.

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Annex I – Companies assessed in this report

We assess 20 companies in this report. We refer to them using shortened names *(see left column)* but assess the company and all subsidiaries covered by the full name *(see right column)*.

Shortened name	Full name
Adidas	Adidas AG
Daimler Truck	Daimler Truck AG
Danone	Danone S.A.
Duke Energy	Duke Energy Corporation
Enel	Enel
ENGIE	ENGIE
Fast retailing	Fast Retailing Co., Ltd.
H&M Group	H & M Hennes & Mauritz AB
Iberdrola	Iberdrola
Inditex	Industria de Diseno Textil S.A.
KEPCO	Korean Electric Power Corporation
Mars	Mars Incorporated
Nestlé	Nestlé S.A.
Nike	Nike Inc.
Stellantis	Stellantis N.V.
Tesco	Tesco PLC
Toyota	Toyota Motor Corporation
Volkswagen Group	Volkswagen AG
Volvo Group	AB Volvo
Walmart	Walmart AG

Selection criteria

We assess the top three global companies for each of the eight following sectors, according to their annual revenue in 2022 (Forbes, 2023): electric utilities; fashion; food and agriculture; automobile manufacturers. Our analysis excludes majority state-owned companies due to our perception that fundamental differences in management structures and decision-making structures for climate change strategy may significantly detract from the comparability of these companies' plans, and the insights that we can draw from the company sample.

For food and agriculture – after including the largest company of the sector – we then include only companies with targets formulated under SBTi's new FLAG guidance, to test the hypothesis that the new FLAG guidance can improve the integrity of agrifood companies' targets.

For automobile manufacturers, we include also the largest 2 companies producing *trucks only*, to understand credibility of plans for heavy duty vehicles.

For this iteration of the Corporate Climate Responsibility Monitor, we did not require "membership of a Race to Zero initiative" as criteria for selection. For example, Daimler Trucks, Korea Electric and Stellantis do not have SBTi targets or other links to Race to Zero campaign. This counters the misguided critique that we attack the best leading companies.

The 20 companies covered by this monitor account for approximately USD 2.3 trillion of revenue in 2022, approximately 6% of revenue from the world's largest 500 companies (Forbes, 2023). Their total self-reported GHG emission footprints in 2019, including scope 3 emissions, amount to approximately 3.9 $GtCO_2e$. This is equivalent to roughly 7% of global GHG emissions.[6]

Section A also includes updates to the companies assessed in the 2022 and 2023 iterations of the Corporate Climate Responsibility Monitor, covering 51 companies in total. These 51 companies account for approximately USD 6.1 trillion of revenue in 2022, approximately 16% of revenue from the world's largest 500 companies (Forbes, 2023). Their total self-reported GHG emission footprints in 2019, including scope 3 emissions, amount to approximately 8.8 $GtCO_2e$. This is equivalent to roughly 15% of global GHG emissions.

6 *Some overlap in emission statistics is likely in the cases that one company's scope 3 emissions are included in the scope 1 or 2 emissions of another company in this analysis. We anticipate that any overlap is marginal and of limited significance to the key insights derived from this report. The companies' combined emission footprint may also be higher than this estimate, due to some companies' incomplete emission disclosure.*

Updated assessments for companies covered in CCRM 22 and CCRM 23

Alongside the detailed analysis of the 20 focus companies of this report, we have updated parts of 31 company assessments previously covered in the Corporate Climate Responsibility Monitors of 2022 and 2023 for our analyses in Part A (Day *et al*., 2022; Day, Mooldijk, Hans, *et al*., 2023). We refer to them using shortened names *(see left column)* but assess the company and all subsidiaries covered by the full name *(see right column)*.

Shortened name	Full name
Corporate Climate Responsibility Monitor 2023	
Ahold Delhaize	Koninklijke Ahold Delhaize N.V.
Amazon	Amazon.com, Inc.
American Airlines	American Airlines Group Inc.
Apple	Apple Inc.
ArcelorMittal	ArcelorMittal S.A.
Carrefour	Carrefour S.A.
Deutsche Post DHL	Deutsche Post AG (Deutsche Post DHL Group)
Foxconn	Hon Hai Precision Industry Co., Ltd.
Google	Alphabet Inc.
Holcim	Holcim Limited
JBS	JBS S. A.
Maersk	A.P Møller - Mærsk A/S
Mercedes-Benz	Mercedes-Benz Group AG
Microsoft	Microsoft Corporation
PepsiCo	PepsiCo, Ltd.
Samsung Electronics /Samsung	Samsung Electronics Co., Ltd.
Thyssenkrupp	ThyssenKrupp AG

Shortened name	Full name
Corporate Climate Responsibility Monitor 2022	
Accenture	Accenture Plc
BWM	BMW AG
CVS Health	CVS Health Corporation
Deutsche Telekom	Deutsche Telekom AG
E.ON	E.ON SE
GlaxoSmithKline	GlaxoSmithKline Plc
Hitachi	K.K. Hitachi Seisakusho
IKEA	Inter IKEA Holding B.V. and Ingka Holding B.V.
Novartis	Novartis AG
Saint-Gobain	Compagnie de Saint-Gobain S.A.
Sony	Sony Group Corporation
Unilever	Unilever Plc
Vale	Vale S.A.
Vodafone	Vodafone Group Plc

Annex II – Target integrity assessments

Adidas

Short-term targets towards 2030	Moderate	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Very poor
➔ What are the targets and what do they actually mean?					
Adidas's **2025 climate neutrality target** covers scope 1 and 2 emissions only and requires these emission sources to be reduced by 90% between 2017 and 2025. This is **equivalent to the reduction of approximately 1%** of Adidas's total value chain emissions in 2019. The target for **a 30% reduction of value chain GHG emissions between 2017 and 2030** is more significant, covering all of the company's disclosed value chain emissions. **We estimate that the wtarget translates to approximately a reduction of 32-44%** of the company's full value chain emissions compared to average emissions levels in the period 2017 to 2023. The upper end of the range is compared to average emissions in the time frame between 2017 and 2023; the lower end of the range is compared to the same average but excluding years that appear as extreme outliers.		No targets identified.		Adidas pledges **carbon neutrality by 2050, but does not commit to a deep emissions reduction target alongside this pledge.** The terminology of this target may be misleading; net-zero targets can give consumers and investors the impression that the company aims to reach deep levels of emission reductions, which the company does not commit to.	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Adidas's 2030 target may be partially aligned with 1.5°C-compatible benchmarks, but the company has made limited very progress since 2017. The meaning of the target is complicated by the fact that Adidas does not publish its emissions for the target base year in 2017 in public documentation, and that Adidas reports major fluctuations in its emissions in the period between 2017 and 2023, without providing explanations. Accordingly, a direct translation to 2019 emissions for comparison to benchmarks and other companies is not possible. A 32-44% reduction below average 2017-2022 emission levels would be significant, and the upper end of that estimate would be aligned with global economy-wide benchmarks to keep warming below 1.5 °C (43% by 2030 compared to 2019 levels(IPCC, 2022)). Given that emissions in the fashion industry occur in various sectors, including agriculture and energy, we expect the industry to decarbonise at the same speed as this global trajectory. The upper end of our estimated 32-44% emission reduction range also meets sector benchmarks, though the lower range falls short of it: the textile and leather industry and the manufactured fibres and synthetic rubber industry should reduce their GHG emissions by 41% and 46%, respectively (2022, pp. 322; 327). While Adidas's 2030 may be partially aligned with 1.5°C-compatible benchmarks, the company has made limited progress towards its target. In 2023, Adidas reported total emissions of 5.1 $MtCO_2e$ (excluding indirect use-phase emissions). This was the first year that the company reported emissions lower than the 2017 baseline of 5.8 $MtCO_2e$.		Adidas's lack of targets for the period 2031-2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022).		**We consider the lack of an explicit emission reduction target alongside the carbon neutrality pledge as highly insufficient** considering the need for deep and credible emission reductions towards mid-century to stand a reasonable chance of limiting global warming to 1.5°C (IPCC, 2022) .	

Daimler Truck

Short-term targets towards 2030	Unclear	Medium-term targets for the period 2031-2040	Moderate	Long-term targets for the period beyond 2040	Moderate
➔ What are the targets and what do they actually mean?					
Daimler Truck commits to the following emission targets towards 2030: • Carbon neutrality for scope 1 and 2 emissions (production facilities) in Europe, India, Japan, and the US by 2025. • 42% reduction scope 1 and 2 emissions by 2030 below 2021. While not committing to any scope 3 emission reduction target towards 2030, Daimler Truck intends to sell "up to 60%" of zero-emission vehicles by 2030 in Europe Japan, and the US (Daimler Truck, 2023a, pp. 78, 81, 93). We interpret this as an aspirational upper bound to sell zero-emission vehicles (ZEVs) by 2030 while reserving Daimler Truck's right to stay below it. The company does not set any minimum lower bound. We cannot independently quantify Daimler Truck emissions reduction by 2030 along the entire value chain as the company does not publicly disclose scope 3 emissions.		Daimler Truck commits to **carbon neutrality for scope 1 and 2 emissions by 2039**, but does not commit to a specific emissions reduction target for these scopes alongside this pledge. Instead, the company vaguely states its intention to use "renewable energies and CO_2 compensation certificates" to meet the target (Daimler Truck, 2023a, p. 93). The company does not commit to any scope 3 emission reduction targets towards 2040 but intends to offer 100% of zero-emission vehicles by 2039 in Europe, Japan, and the US (Daimler Truck, 2023a, pp. 81, 93). For these three geographies, the company aims for carbon neutral products and services in its supply chain by 2039 (Daimler Truck, 2023a, pp. 81, 93). We cannot independently quantify Daimler Truck emissions reduction by 2040 along the entire value chain as the company does not publicly disclose scope 3 emissions.		Daimler Truck aims to achieve **carbon neutrality across the entire value chain by 2050,** but does not commit to a specific emissions reduction target alongside this pledge. Since the company's carbon neutrality pledge does not entail any explicit commitment to deep decarbonisation, labelling it as a 'carbon neutrality target' may be misleading. Daimler Truck also aims to sell only zero-emission vehicles worldwide by 2050, with a target already set to achieve this in Europe, the United States and Japan by 2039 already (Daimler Truck, 2023a, pp. 78, 81).
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
We cannot independently assess Daimler Truck's aspirational and non-committal intention to sell zero-emission vehicles by 2030 against existing 1.5°C-aligned milestones. Recent literature suggests that 30–37% of heavy-duty trucks should be battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) globally by 2030 to align with the 1.5°C Paris Agreement targets (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). Daimler Truck merely outlines its intention to sell "up to 60%" of zero-emission vehicles by 2030 in Europe, Japan, and the United States (Daimler Truck, 2023a, pp. 78, 81, 93). These key markets jointly represent around 75% of its total revenue in 2022. We interpret this as an aspirational upper bound for the sales of ZEVs, allowing Daimler Truck leeway to sell fewer vehicles if necessary. In addition, we cannot find any targets for the sale of zero-emission vehicles by 2030 in other markets, which collectively accounted for 25% of total revenue in 2022. Furthermore, there is no emission reduction target for its upstream scope 3 emissions.		**Daimler Truck's 2039 interim targets partially meet 1.5°C Paris Agreement-aligned milestones for heavy-duty vehicle manufacturers' downstream scope 3 emissions, as identified in existing literature** (UNFCCC, 2021, pp. 10–11; Mission Possible Partnership, 2022, p. 40; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). Daimler Truck aims to offer 100% of zero-emission vehicles by 2039 in Europe, Japan, and the United States (Daimler Truck, 2023a, pp. 81, 93), jointly representing around 75% of its total revenue as key markets in 2022. This is in line with the 1.5°C-compatible shares of 100% battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) by 2040 in advanced economies and China (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88–93). However, we could not identify any targets for the sale of zero-emission vehicles towards 2040 in other markets outside Europe, Japan, and the US, which collectively accounted for 25% of total revenue in 2022. Additionally, we could not identify specific targets for its scope 1, 2, and upstream scope 3 emissions alongside the two scope-specific carbon neutrality pledges.		**Daimler Truck's global target to sell 100% zero-emission vehicles by 2050 meets the 1.5°C-aligned milestones identified in existing literature** (UNFCCC, 2021, pp. 10–11; Mission Possible Partnership, 2022, p. 40; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). This global phase-out date for ICEs in heavy-duty vehicles is in line with upper range of decarbonisation milestones identified in the literature, which suggests reaching a 100% share of battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) between 2045–2050 globally (Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93).

Danone

Short-term targets towards 2030	Reasonable	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Moderate
➔ What are the targets and what do they actually mean?					
What are the targets and what do they actually mean? By 2030, compared to 2020 levels: • Reduce scope 1 (excluding FLAG emissions) and 2 emissions by 47.2% • Reduce scope 1 and 3 FLAG emissions by 30.3% • Reduce scope 3 non-FLAG emissions by 42.0% • Reduce methane emissions from fresh milk by 30% **Danone's short-term targets translate to an emission reduction of 30% compared to 2019 value chain emissions.** The share of emissions not covered equals roughly 6 $MtCO_2e$ in 2030, when comparing the baseline emissions presented in the Climate Transition Plan to emissions disclosed under CDP. **We could not include Danone's methane target in this estimate.** Danone does not provide baseline emissions for methane specifically, and it is unclear whether this target is contained within – or additional to – other scope 1 and 3 targets.		No targets identified for the 2031-2040 period.		**Danone does not commit to a deep emissions reduction target alongside its 2050 net-zero pledge. However, the company's estimated residual emissions in 2050 would imply an emission reduction of roughly 63% compared to 2019 value chain emissions.** Since these estimated reductions under the net-zero pledge fall short of a commitment to deep emission reductions (i.e., at least 90% below 2019 levels globally, or 72% for the agriculture sector), we consider that the terminology of the net-zero target may be potentially misleading. Moreover, the company's net-zero pledge does not entail an explicit commitment to this level of emission reductions.	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Danone's range of short-term targets almost meets 1.5°C Paris Agreement-aligned milestones for the food and agriculture sector identified in existing literature for the emission sources that they cover, although some emission sources are not covered by the targets. Teske (2022, p. 328) describes that between 2019 and 2030, the food and agriculture industry should reduce its scope 3 emissions by 34%. Overall, the company's 2030 targets – including emission sources that are not covered by the target – are almost aligned with this benchmark. Boehm *et al.* (2023) describe emission reduction requirements of 17% for enteric fermentation and 21% for manure management, both below 2017 levels. Danone's implied emission reduction targets go beyond these levels. The SBTi published its guidance for Forest, Land, and Agriculture (FLAG) in 2022. Although the FLAG guidance requires companies to commit to annual reductions of at least 3.03%, translating to reductions of 30.3% between 2020 and 2030 (SBTi, 2022b, pp. 44–45), this includes land sequestration carbon dioxide removals. We cannot use the FLAG guidance for this assessment due to the lack of specificity on the role of emission reductions vis-à-vis land sequestration CDR, towards aligning with 1.5°C-compatible transition pathways for the sector.		Danone's lack of targets for the period 2031-2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022).		**We find that Danone's 2050 target meets 1.5°C Paris Agreement aligned milestones for food and agriculture sector.** Teske (2022, p. 328) identifies 1.5°C-aligned absolute emission reduction milestones for various emission sources of agricultural activities, which represent upstream scope 3 emissions for Danone. All energy-related emissions need to reduce 100% by 2050, whereas AFOLU emissions and non-CO_2 emissions need to reduce by 42% by 2050 below 2019 levels. In sum, these required reductions mean a reduction of 51% across all scopes, below 2019 levels. Danone's implied emission reduction commitment aligns with this. The Transition Pathways Initiative (TPI) derives an emission intensity per tonne of agricultural input aligned with '1.5°Ctrajectories by 2050: 0.414 tCO_2/tonne agricultural input (Dietz *et al.*, 2022, p. 13). This represents an 85% reduction in intensity compared to 2.751 tCO_2/tonne agricultural input in the 2020 base year. Due to a lack of information on intensity and volumes of agricultural input, we cannot directly assess whether Danone's implied emission reduction commitment meets these intensity benchmarks. However, the implied emission reduction commitment and plan to increase the share of plant-based protein in production contribute to the shift that is signalled by the required change in intensities. Boehm *et al.* (2023) describe emission reduction requirements of 29% for enteric fermentation and 39% for manure management, both below 2017 levels. Danone's implied emission reduction commitment goes beyond these levels. We evaluate Danone's implied emission reduction commitment moderate rather than high or reasonable because Danone does not commit to the implied reductions that we derive from the company's estimated residual emissions. The company only provides an estimate of residual emissions; we do not consider this to represent an explicit emission reduction commitment.	

Duke Energy

Short-term targets towards 2030	Very Poor	Medium-term targets for the period 2031-2040	Poor	Long-term targets for the period beyond 2040	Very poor
➔ What are the targets and what do they actually mean?					
Duke Energy commits to the following emission reduction targets towards 2030 (Duke Energy, 2023a, p. 65): • Reduction of scope 1 carbon emissions from electricity generation by at least 50% below 2005 levels • Net-zero methane emissions from its fossil gas distribution business The company's scope 1 target **translates to a reduction of 14% across the value chain below 2019 levels by 2030.** Duke Energy anticipates that its target intensity from scope 1 emissions will be about 225 gCO_2e/kWh by 2030 (Duke Energy, 2022, p. 58). Alongside these emission reduction targets, Duke Energy plans to expand its renewable energy portfolio to constitute 20% of its total generation capacity by 2030, and to reduce the share of coal in its total generation to below 5% by 2030, pending regulatory approval.		Duke Energy set the following targets towards 2040 (Duke Energy, 2023a, p. 65,67): • Reduction of carbon scope 1 emissions from electricity generation by 80% below 2005 levels by 2040 • Reduction of scope 2 and some scope 3 emissions (fossil fuel procurement, power purchased for resale, and downstream use of gas) by 50% below 2021 levels by 2035. **These commitments translate to a reduction of 39% across the value chain below 2019 levels by 2040.** Duke Energy aims to reach 35,000 MW of renewable energy capacity by 2035 and anticipates renewable generation share of 35% by 2040. Duke Energy aims to exit from coal generation by 2035, pending regulatory approval (Duke Energy, 2023a, p. 65).		Duke Energy has pledged to achieve net-zero carbon emissions by 2050 (Duke Energy, 2023a, p. 65). Since Duke Energy's net-zero pledge does not include a specific emission reduction commitment, we consider that the terminology of this target may be misleading. 'Net zero' terminology can give the impression that Duke Energy aims to reach deep levels of emission reductions, which the company does not commit to. Duke Energy aims to reach 40% renewable generation and to phase out fossil gas in generation by 2050 (Duke Energy, 2023a, p. 20,48,49).	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Duke Energy's short-term targets do not meet 1.5°C Paris Agreement-aligned milestones for electric utilities based on available literature. The IEA Net Zero Report highlights that the energy sector needs to reduce emissions by 44% by 2030 relative to 2021 levels to align with a 1.5°C pathway (IEA, 2023c). Duke Energy's emissions reduction target translates to an 8% reduction within that period, falling far below the sector benchmark. **Duke Energy's projected carbon intensity of approximately 225 gCO_2e/kWh by 2030 does not align with sectoral benchmarks.** Boehm *et al.* (2023, p. 29) and CAT (2023b, p. 20) find that carbon intensity should decrease to 25-26 gCO_2e/kWh in the United States by 2030; Teske *et al.* (Teske *et al.*, 2023) proposes a maximum of 64 gCO_2/kWh in OECD countries. TPI's benchmark of 138 gCO_2e/kWh is taken from the IEA's 2021 Net Zero by 2050 report, but the IEA (2023) has since revised this benchmark to 186 gCO_2e/kWh (Dietz, Gardiner, *et al.*, 2021; IEA, 2023c). The IEA foresees higher levels of CCS and BECCS than CAT and the State of Climate Action report (Boehm *et al.*, 2023, p. 29). Duke Energy's target for 20% renewable energy by 2030 falls far below the 68%-86% benchmark for the United States (CAT, 2023b, p. 16).		**Duke Energy's medium-term targets do not meet 1.5°C Paris Agreement-aligned milestones for electric utilities based on available literature.** Developed countries need to reach net-zero emissions by 2035 to stay within a 1.5°C-compatible pathway (equivalent to 0 gCO_2e/kWh) (IEA, 2023c). The company's projected carbon intensity for energy production is estimated to be around 45 gCO_2e/kWh by 2040. This is partly due to the company's plan to retire certain coal fleets only by 2035, missing the more stringent phase-out recommendation for advanced economies by 2030 as suggested by the IEA. Duke Energy anticipates that natural gas will account for 27% of its generation mix by 2040, despite recent literature suggesting the need for the full phase-out of unabated fossil gas in the United States by 2040 (CAT, 2023b, p. 12). Duke Energy's renewable energy target of 35% in its generation mix by 2040 falls significantly short of 1.5°C-aligned benchmarks, which recommend 85%–95% renewables by 2035 and 93%–97% renewables by 2040 in the United States (CAT, 2023b, p. 16).		**Duke Energy's long-term net-zero by 2050 target does not meet a 1.5°C Paris Agreement-aligned milestones for electric utilities.** Duke Energy's commitment to achieving net-zero emissions by 2050 does not meet the urgent timelines required for electric utilities in advanced economies, which need to reach net zero by 2035 (IEA, 2023c). The company's plan to phase out fossil gas only by 2050 indicates a slow transition pace away from fossil-fuel-based electricity generation and poses the risk of a fossil gas lock-in and stranded assets. Duke Energy's renewable energy target of 40% in its generation mix by 2050 also falls significantly short of the global 1.5°C-aligned benchmarks, which recommend a range of 99%-100% renewable energy by 2050 (CAT, 2023b, p. 16).	

Enel

Short-term targets towards 2030	Moderate	Medium-term targets for the period 2031-2040	Reasonnable

→ What are the targets and what do they actually mean?

Enel commits to the following emission reduction targets towards 2030, compared to 2017, which translate to a **reduction of 59% across the value chain by 2030.**

- 68% reduction in all absolute scope 1, 2 and 3 GHG emissions.
- 80% reduction in carbon intensity relating to power generation, resulting in a carbon intensity of 72 gCO_2e/kWh (covering 98% of scope 1 emissions.)
- 78% reduction in carbon intensity relating to integrated power, resulting in a carbon intensity of 73 gCO_2e/kWh (covering 98% of scope 1 emissions and 73% of scope 3 emissions, category 3.)
- 55% reduction in absolute emissions relating to gas retail (covering 100% of scope 3 emissions, category 11)
- 55% reduction in "additional absolute GHG emissions" (covering 0.4% of scope 1 emissions, 100% of scope 2 emissions, 28.6% of scope 3 emissions, category 1 for the 2030 target, and 40% for the 2040 target, and 26.6% of scope 3 emissions, category 3.

Enel also commits to phasing-out coal in electricity generation by 2027, and achieving an 85% share of renewables in total installed capacity by 2030.

Enel has pledged to achieve **net-zero zero emissions by 2040,** including **at least 98% emission reductions,** compared to 2017:

- 99% reduction in all absolute scope 1, 2 and 3 GHG emissions.
- 100% reduction in carbon intensity relating to power generation (covering 98% of scope 1 emissions).
- 100% reduction in carbon intensity relating to integrated power (covering 98% of scope 1 emissions and 73% of scope 3 emissions, category 3).
- 100% reduction in absolute emissions relating to gas retail (covering 100% of scope 3 emissions, category 11).
- 90% reduction in additional absolute GHG emissions, resulting in residual emissions of 2.5 Mt CO_2e (covering 0.4% of scope 1 emissions, 100% of scope 2 emissions, 28.6% of scope 3 emissions, category 1 for the 2030 target and 40% for the 2040 target, and 26.6% of scope 3 emissions, category 3).

Enel also commits to phase-out gas in electricity generation and exit from retail gas sales by 2040, and to achieving a100% share of renewables in total installed capacities by 2040.

→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?

Enel's 2030 targets partially meet the 1.5°C Paris Agreement-aligned milestones for electric utilities, as identified in existing literature. Boehm *et al.* (2023, p. 29) and CAT (2023b, p. 20) suggest that global carbon intensity should decrease to 48-80 gCO_2e/kWh by 2030, and to 6-12 gCO_2e/kWh in the EU (CAT, 2023b, p. 19); Teske *et al.* (Teske *et al.*, 2023) propose 132 gCO_2/kWh globally and 80 gCO_2/kWh in the EU. The benchmark by the Transition Performance Initiative of 138 gCO_2e/kWh is taken from the IEA's 2021 Net Zero by 2050 report, but the IEA has since revised this benchmark to 186 gCO_2e/kWh (Dietz, Gardiner, *et al.*, 2021; IEA, 2023c). The IEA allows for higher levels of CCS and BECCS than CAT and the State of Climate Action report (Boehm *et al.*, 2023, p. 29).

Enel's intensity targets fall within the lower end of this range, with 72g CO_2e/kWh for power generation (scope 1) and 73g CO_2e/kWh for integrated power. However, these targets are significantly higher than the benchmarks set for the EU, where Enel generated 83% of its revenues in 2022 (Enel, 2023a, p. 460).

Enel's emission reduction target of 59% by 2030 below 2019 levels (own calculations) is in line with the 1.5°C-compatible pathway for the energy sector suggested by the IEA (IEA, 2023c). The recommends a 44% absolute emissions reduction globally by 2030, compared to 2021. However, in the EU, the power sector needs to achieve even steeper emission reductions and reach net zero by 2035 (IEA, 2023c). Enel's target of 85% of renewable capacity in its energy mix by 2030 surpasses global benchmarks, which recommend a share of 68% renewable energy in installed capacities by 2030 (IEA, 2023c).

Enel's 2040 medium-term targets partly meet the 1.5°C Paris Agreement-aligned milestones for electric utilities, as identified in existing literature. Enel aims to achieve zero carbon intensity for electricity generation (including its own generation and purchased electricity) by 2040 and to exit from gas by the same year. These goals are in line with the 1.5°C-compatible pathway suggested in the IEA Net Zero Report, which requires the energy sector to reach a CO_2 intensity of electricity generation of 3g CO_2e/kWh in 2040 (IEA, 2023b, p199). However, Enel's headline target of achieving net-zero emissions by 2040 falls short of the urgent timelines required for electric utilities in advanced economies, which should aim for net zero by 2035 (IEA, 2023c). On the other hand, Enel's target of 100% of renewable capacity in its energy mix by 2040 surpasses the 1.5°C-compatible global benchmarks, which recommends a share of 80% renewable energy in installed capacities (IEA, 2023c).

ENGIE

Short-term targets towards 2030	Very poor	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Very poor
➔ What are the targets and what do they actually mean?					
ENGIE commits to the following targets towards 2030, compared to 2022 (own calculations): • 40% reduction in absolute GHG emissions from energy production (scopes 1 and 3). • 26% reduction in absolute GHG emissions from final gas sales (scope 3). • 42% reduction in carbon intensity for energy production (scope 1) and energy consumption (scope 2), resulting in a carbon intensity of 110gCO_2e/kWh • 44% reduction in carbon intensity for energy sales produced (scopes 1 and 3) and purchased (scope 3), resulting in a carbon intensity of 152 gCO_2e/kWh • 6% reduction in absolute "other GHG emissions, including scope 3 from procurement, capital goods, and the upstream of purchased fuels and electricity (scope 3 categories 1, 2 and 3)". ENGIE also commits a coal-phase out by 2027 for own electricity generation, and a 58% share of renewables capacity in its electricity mix by 2030. ENGIE's absolute targets of 43 MtCO_2e from energy production and 52 MtCO_2e from final gas sales amount to **a reduction of at least 24% below 2019 levels across full value chain emissions by 2030** (based on own calculations). The company's different targets span different scopes, with coverage sometimes not specified, making it impossible to aggregate them into one single absolute target for 2030.		No target identified.		**ENGIE aims to reach net zero by 2045.** Their commitment is "net zero carbon" but we understand this to cover all GHG emissions, because Enel accompanies the target by a commitment to reduce GHG by 90%. This translates to **a reduction of 86% by 2045 below 2019 levels** across the entire value chain alongside its net-zero pledge. Since this reduction target falls short of a commitment to deep emission reductions (i.e., at least 90% below 2019 levels), we consider that the "net zero" terminology may be misleading. This position is in line with the ISO Guidelines for Net Zero and the SBTi Net Zero Standard (ISO, 2022; SBTi, 2023b).	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
ENGIE's 2030 targets do not meet the 1.5°C Paris Agreement-aligned milestones for electric utilities, as identified in existing literature. Boehm *et al.* (2023, p. 29) and CAT (2023b, p. 20) suggest that global carbon intensity should decrease to 48-80 gCO_2e/kWh by 2030, and to 6-12 gCO_2e/kWh in the EU (CAT, 2023b, p. 19); Teske *et al.* (Teske *et al.*, 2023) propose 132 gCO_2/kWh globally and 80 gCO_2/kWh in the EU. The benchmark by the Transition Performance Initiative of 138 gCO_2e/kWh is taken from the IEA's 2021 Net Zero by 2050 report, but the IEA has since revised this benchmark to 186 gCO_2e/kWh (Dietz, Gardiner, *et al.*, 2021; IEA, 2023c). The IEA allows for higher levels of CCS and BECCS than CAT and the State of Climate Action report (Boehm *et al.*, 2023, p. 29). ENGIE's intensity targets fall within the upper part of the benchmark range: 110 gCO_2e/kWh for energy production (scope 1) and energy consumption (scope 2) and 153 gCO_2e/kWh for energy sales produced (scopes 1 and 3) and purchased (scope 3). However, they significantly surpass the benchmarks for the EU, where ENGIE has 40% of its installed capacities (ENGIE, 2023, p. 3). According to the IEA Net Zero Report, aligning the energy sector with a 1.5°C-compatible pathway requires a 44% emissions reduction globally by 2030 compared to 2021 (IEA, 2023c). In Europe, the power sector needs to achieve even steeper emission reductions and reach net zero by 2035 (IEA, 2023c). ENGIE's targets fall significantly short of this benchmark. Engie's target of 58% of renewable capacity also falls short of the global benchmark for a 68% renewable energy capacity share by 2030 (IEA, 2023c).		ENGIE's absence of targets for the period towards 2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision, as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022).		**ENGIE's 2045 target does not meet 1.5°C Paris Agreement aligned milestones for electric utilities identified in existing literature.** The emissions reduction target of 86% below 2019 levels means that the company plans to still emit up to 26 MtCO_2e GHG emissions in 2045, although alternatives to achieve zero emissions in the electric utilities sector already exist. The IEA and CAT emphasise that staying within a 1.5°C-compatible pathway will require electric utilities in developed countries like the EU to reach net zero (equivalent to 0 gCO_2e/kWh) by 2035, ten years earlier than 2045 (CAT, 2023b; IEA, 2023c).	

Fast Retailing

Short-term targets towards 2030	Very poor	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Very poor
→ What are the targets and what do they actually mean?					
For 2030, Fast retailing commits to: • Reduce absolute emissions from its own operations (such as stores and main offices) by 90% below 2019 levels. • **Reduce absolute emissions from raw materials, fabric, and garment production for the Uniqlo and GU brands by 20% by 2030 below 2019 levels.** **These targets equate to a commitment to reduce all value chain emissions footprint by 19% by 2030**, compared to 2019 levels.		No targets identified.		Fast Retailing pledges to reach **net-zero emissions by 2050, but does not commit to a deep emissions reduction target alongside this pledge.** The terminology of this target may be misleading; net-zero targets can give consumers and investors the impression that the company aims to reach deep levels of emission reductions, which the company does not commit to.	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector? These targets do not meet cross-sectoral and sector-specific 1.5°C Paris Agreement-aligned milestones identified in existing literature. According to the IPCC's global economy-wide benchmarks to keep warming below 1.5°C, GHG emissions should reduce by 43% by 2030 compared to 2019 levels (IPCC, 2022). Given that emissions in the fashion industry occur in various sectors, including agriculture and energy, we expect the industry to decarbonise at the same speed as this global trajectory. Fast Retailing's targets fall short of this global benchmark. The targets also miss sectoral benchmarks. Teske (2022, pp. 322; 327) considers that between 2019 and 2030, the textile and leather industry and the manufactured fibres and synthetic rubber industry should reduce their GHG emissions by 41% and 46%, respectively. To be in line with these sectoral benchmarks, Fast Retailing's target for upstream scope 3 emissions should be set at a level of at least 41%. However, its target for upstream scope 3 emissions represents a 16% reduction below 2019. Assuming that emissions are reduced linearly in the 2019–2030 period, Fast Retailing is currently committed to annual emission reductions of 8.2% for scopes 1 and 2 and 1.3% for scope 3, by 2030. The SBTi guidance requires companies in the apparel industry to commit to annual reductions in their scope 1, 2 and 3 emissions of at least 2.5% to comply with the 'well below 2°C' benchmark and 4.2% to comply with the SBTi's 1.5°C benchmark (SBTi, 2018, pp. 22; 27). While Fast Retailing's reduction target for scope 1 and 2 emissions is likely aligned with the SBTi's 1.5°C, its target for scope 3 does not even meet the 'well below 2°C' benchmark.		Fast Retailing's lack of targets for the period 2031-2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022).		**We consider the lack of an explicit emission reduction target alongside the net zero pledge as highly insufficient** considering the need for deep and credible emission reductions towards mid-century to stand a reasonable chance of limiting global warming to 1.5°C (IPCC, 2022).	

H&M Group

Short-term targets towards 2030	Reasonable	Medium-term targets for the period 2031-2040	Reasonable	Long-term targets for the period beyond 2040	N/A
➔ What are the targets and what do they actually mean?					
H&M Group commits to reducing emissions across the entire value chain by 56% by 2030, compared to 2019 levels.		**H&M Group commits to an emissions reduction target of 90% by 2040** below 2019 levels across the entire value chain alongside its net-zero pledge.		H&M Group does not commit to any emission reduction target beyond 2040, but has already committed to deep decarbonisation in the medium term towards 2040.	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
H&M Group's 2030 emission reduction target meets global and sectoral 1.5°C-aligned benchmarks. Given that emissions in the fashion industry occur in various sectors, including agriculture and energy, we consider this target aligned with global benchmarks that require GHG and CO_2 emissions to reduce by 43% and 48% by 2030 respectively (IPCC, 2022). Teske (2022) considers that between 2019 and 2030, the textile and leather industry and the manufactured fibres and synthetic rubber industry should reduce their GHG emissions in absolute terms by 41% and 46%, respectively. This covers all emissions associated with producing fabrics and other materials and manufacturing the clothes. To be in line with these sectoral benchmarks, H&M Group's target for upstream scope 3 emissions should be set at a level of at least 41%. The company's target goes beyond this reduction level. We evaluate H&M Group's 2030 target as 'reasonable' rather than 'high' integrity because of the lack of a corresponding short-term target within a five-year timeframe to substantiate it. Setting short-term interim targets in a similar format as its 2030 targets requiring immediate action and accountability are of primary importance for credible corporate commitments to fight climate change (ISO, 2022; UN HLEG, 2022).		**H&M Group's 2040 emission reduction target meets global and sectoral 1.5°C-aligned benchmarks.** Given that emissions in the fashion industry occur in various sectors, including agriculture and energy, we consider this target aligned with global benchmarks. According to the IPCC's global economy-wide benchmarks to keep warming below 1.5°C, GHG emissions should reduce by 80% by 2040, compared to 2019 levels (IPCC, 2022). The target also meets benchmarks for fashion retailers' upstream scope 3 emissions. According to Teske (2022), emissions in the manufactured fibres and synthetic rubber industry need to reduce by 76% and emissions in the textile and leather sector by 74% by 2040, below 2019 levels. These emissions form part of H&M Group's upstream scope 3 emissions. We evaluate H&M Group's 2040 target as 'reasonable' integrity rather than 'high' because of the lack of interim targets on five-year intervals, as per the recommendations of the UN High Level Expert Group on Net Zero (ISO, 2022; UN HLEG, 2022).		

Iberdrola

Short-term targets towards 2030	Reasonable	Medium-term targets for the period 2031-2040	Moderate

➔ What are the targets and what do they actually mean?

Iberdrola has pledged to reach carbon neutrality in scope 1 and 2 emissions by 2030. Furthermore, it commits to reducing absolute scope 1, 2 and 3 GHG emissions by 65% by 2030 compared to a 2020 base year with the following breakdown (Iberdrola, 2023a):

- A reduction of scope 1 and 2 GHG emissions from power generation by 83% per kWh
- A reduction of scope 1 and 3 GHG emissions from fuel and energy-related activities, covering all sold electricity, by 85% per kWh.
- A reduction of absolute scope 3 GHG emissions from the use of sold products by 42%
- A reduction of all remaining absolute scope 3 GHG emissions by 46%

To substantiate its short- and medium-term targets, Iberdrola also estimates a path to reduce absolute scope 1, 2 and 3 GHG emissions by 20% by 2026 from a 2020 base year (Iberdrola, 2023g).

These targets translate to a reduction of 64% across the value chain below 2019 levels by 2030 and a reduction of 61% across the value chain below 2021 levels by 2030. Since the company's short-term pledge does not entail any commitment to deep decarbonisation (i.e., reduction of at least 90% of 2019 emissions across the entire value chain), we consider that the 'carbon neutrality' terminology of its short-term target may be misleading. Using 'carbon neutrality' terminology can give consumers and investors the impression that Iberdrola aims to reach deep levels of emission reductions, which the company does not commit to.

Iberdrola has pledged to achieve net zero across all scopes before 2040. This commitment translates to a reduction in scope 1, 2 and 3 emissions by 90% by 2039 from a 2020 base year with the following breakdown (Iberdrola, 2023a):

- A reduction of scope 1 and 2 GHG emissions from power generation by 84% per kWh
- A reduction of scope 1 and 3 GHG emissions from fuel and energy related activities, covering all sold electricity, by 95% per kWh
- A reduction of absolute scope 3 GHG emissions from the use of sold products by 90%
- A reduction of all remaining absolute scope 3 GHG emissions by 90%

Iberdrola commits to an emissions reduction target of at least 90% by 2040 below 2019 levels across the entire value chain alongside its net-zero pledge.

➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?

Iberdrola's short-term emissions reduction commitments are in line with a 1.5°C trajectory for the electric utilities, based on available literature. The IEA Net Zero by 2050 Report highlights that the energy sector needs to reduce emissions by 44% by 2030 relative to 2021 levels to align with a 1.5°C pathway (IEA, 2023c). Iberdrola's emissions reduction target of 61% from 2021 to 2030 (own calculations) exceeds this industry benchmark.

Iberdrola has already closed its last coal plants in 2020, significantly ahead of the 2030 deadline for phasing out unabated coal in advanced economies (CAT, 2023b; IEA, 2023c). In 2030, Iberdrola's own renewable energy installed capacity will account for 93% of its total installed capacity, which outperforms the global benchmarks of 68-77% of renewable energy installed capacity by 2030 (IEA, 2023c; IRENA, 2023c). The company's focus on renewables is expected to contribute to a significant reduction in Iberdrola's carbon intensity for energy production (scope 1). By 2030, its emission intensity is expected to fall below 10 gCO_2e/kWh, marking a 90% decrease from 2019 levels (Iberdrola, 2023c, 2023f, p. 64). This figure is notably lower than the recommended carbon intensity range of 48-186 gCO_2e/kWh by 2030 to stay below the 1.5°C threshold as suggested by existing literature (Dietz, Gardiner, *et al.*, 2021; Boehm *et al.*, 2023; CAT, 2023c, 2023b; IEA, 2023c; Jaeger *et al.*, 2023; Teske *et al.*, 2023). Iberdrola's carbon intensity target in 2030 also falls within the recommended carbon intensity range of 6-12 gCO_2e/kWh in the EU27 region by 2030 to align with a 1.5°C pathway (CAT, 2023b, p. 20).

Iberdrola's 2040 medium-term targets partially meet the 1.5°C Paris Agreement-aligned milestones for electric utilities, based on available literature. Iberdrola's 2040 net-zero target falls short of the more urgent timelines recommended for electric utilities in advanced economies, which are advised to aim for net zero by 2035 (IEA, 2023c). While the IEA suggests that the global energy sector should reach net zero by 2045, advanced economies should reach this milestone a decade earlier (IEA, 2023c). Given that Iberdrola operates mainly in the European Union, United Kingdom and United States, the company should bring its net-zero target forward to 2035 to meet these regional benchmarks. Moreover, Iberdrola has yet to announce a strategy for the phase-out of its fossil gas-fired power plant portfolio or for ending its fossil gas sales. To align with a 1.5°C pathway, Iberdrola should phase out unabated fossil gas by 2035 in developed countries (CAT, 2023b; IEA, 2023c), and by 2040 in developing countries (CAT, 2023b, p. 1). Additionally, Iberdrola's 2040 target is assessed as having 'moderate' integrity rather than 'reasonable,' due to the lack of a corresponding target within a five-year timeframe to substantiate it.

Inditex

Short-term targets towards 2030	Reasonable	Medium-term targets for the period 2031-2040	Reasonable	Long-term targets for the period beyond 2040	N/A
→ What are the targets and what do they actually mean?					
Inditex has set out two interim GHG emissions targets: • Reduce scope 1 and 2 emissions by 90% below 2018 levels by 2030. • Reduce scope 3 emissions by 50% below 2018 levels by 2030. **The targets jointly represent a reduction of 46% by 2030 across the entire value chain** below 2019 levels. To estimate the implied reduction in Inditex's targets, we consider their whole value chain emissions, which we calculate by using the larger scope 2 estimate. For Inditex, this is the location-based estimate. As Inditex's targets clearly state that they only apply to market-based scope 2 emissions, we first calculate the scope 2 emission reduction based on the market-based estimate and then tally up that reduction against Inditex's full value chain emissions.		Inditex's headline pledge includes a **commitment to reach net-zero GHG emissions by 2040**. Alongside its headline pledge, Inditex commits to reducing its full value chain emissions (scope 1, 2, and 3) by 90% below 2018 levels. **This target represents a reduction of 89% below 2019 levels by 2040.** Since the net zero pledge entails a commitment to deep decarbonisation across the entire value chain, we consider that the net zero terminology is unlikely to be misleading. Net zero targets can give consumers and investors the impression that the company aims to reach deep levels of emission reductions, which the company has committed itself to do.		Inditex does not commit to any emission reduction target beyond 2040, but has already committed to deep decarbonisation in the medium term towards 2040.	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Inditex's commitment for emission reductions across the value chain meet 1.5°C-aligned milestones identified in existing literature. According to the IPCC's global economy-wide benchmarks to keep warming below 1.5°C, GHG emissions should reduce by 43% by 2030, compared to 2019 (IPCC, 2022). Given that emissions in the fashion industry occur in various sectors, including agriculture and energy, we expect the industry to decarbonise at the same speed as this global trajectory. Inditex's targets currently meet this global benchmark. The company's scope 3 2030 target is also aligned with other 1.5°C-compatible sectoral benchmarks. Teske (2022) considers that between 2019 and 2030, the textile and leather industry and the manufactured fibres and synthetic rubber industry should reduce their GHG emissions by 41% and 46%, respectively. This covers all emissions associated with producing fabrics and other materials and manufacturing the clothes. To be in line with these sectoral benchmarks, Inditex's target for upstream scope 3 emissions should be set at a level of at least 41%. Inditex's scope 3 target implies a reduction of 48% below 2019 levels when considering only scope 3 emissions.		**Inditex's reduction commitment across the value chain meets 1.5°C-aligned milestones as identified in existing literature.** According to the IPCC's global economy-wide benchmarks to keep warming below 1.5°C, GHG emissions should reduce by 80% by 2040, compared to 2019 (IPCC, 2022). Given that emissions in the fashion industry occur in various sectors, including agriculture and energy, we expect the industry to decarbonise at the same speed as this global trajectory. Inditex's targets currently meet this global benchmark. **The company's 2040 target is also aligned with other 1.5°C-compatible sectoral benchmarks.** Teske (2022) considers that between 2019 and 2040, the textile and leather industry and the manufactured fibres and synthetic rubber industry should reduce their scope 1 GHG emissions by 71-74%, scope 2 by 92%, and scope 3 by 44%. Inditex's implied target of reducing their whole value chain emissions by 89% below 2019 levels clearly meets these benchmarks.		

KEPCO

Short-term targets towards 2030	Very poor	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Very poor
➔ What are the targets and what do they actually mean?					
KEPCO commits to reducing its scope 1 and 2 emissions by 47.4% by 2030, using 2018 as the baseline (KEPCO, 2023, p. 31). Alongside this, the company aims for renewables to account for 21.5% of its total generation capacity by 2030 (KEPCO, 2022, p. 70). KEPCO's commitment to reducing emissions for scope 1 and 2 translates to **a reduction of 18% across the value chain by 2030 compared to its 2019 baseline**, or 22% below 2021 levels (own calculations).		No target identified.		KEPCO has pledged to reach **carbon neutrality for its own operations (i.e. scopes 1 and 2) by 2050**, but does not present a specific emissions reduction commitment alongside this pledge. Since the company's pledge does not entail any commitment to deep decarbonisation, we consider that the 'carbon neutrality' terminology of this target may be misleading.	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
KEPCO's short-term emissions reduction commitments do not align with the 1.5°C trajectory for the electric utilities sector, based on available literature. According to the IEA Net Zero by 2050 Report, aligning the energy sector with a 1.5°C-compatible pathway requires a 44% emissions reduction globally in 2030 compared to 2021 (IEA, 2023c). In South Korea, an advanced economy, the power sector needs to realise steeper emission reductions and reach net zero by 2035 (IEA, 2023c). KEPCO's commitment to a reduction of 22% between 2021 and 2030 (own calculations) falls well below the sector benchmark and would postpone necessary reductions beyond 2030. KEPCO's target of achieving a 21.5% share of renewable generation in its energy mix also falls short of global benchmarks (KEPCO, 2022, p. 70), which recommend a range of 59-89% renewables share in total generation by 2030 (Boehm *et al.*, 2023; CAT, 2023b; IEA, 2023c; IRENA, 2023c). Due to limited data disclosed by KEPCO, we were unable to assess the company's carbon intensity and its alignment with a 1.5°C pathway.		KEPCO's lack of medium-term targets towards 2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022, p. 15).		**KEPCO's long-term goal of achieving carbon neutrality by 2050 does not meet the 1.5°C Paris Agreement-aligned milestones for electric utilities.** While we are unable to calculate the actual reductions across the full value chain associated with the carbon neutrality target due to limited data, it is evident that the target does not meet the urgent timelines required for electric utilities in advanced economies, such as South Korea, which should aim for net-zero emissions by 2035 (IEA, 2023c). Additionally, KEPCO's carbon neutrality target excludes scope 3 emissions, which account for over half of the company's current emissions. Bringing the company on the 1.5°C-compatible trajectory requires substantial emission reductions across all scopes, including scope 3.	

Mars

Short-term targets towards 2030	High	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Reasonable
→ What are the targets and what do they actually mean?					
Mars commits to reduce 2015 value chain emissions (roughly equal to 2019 emissions) by **27% by 2025, and by 50% by 2030.**		No targets identified for the 2031-2040 period.		Mars has pledged **net-zero emissions by 2050.** Mars commits to an **emissions reduction target of 80% by 2050 below 2019 levels** across the entire value chain alongside its net-zero pledge. We assume that the company does not plan to claim land sequestration carbon dioxide removals towards this 80% target, as the company has explicitly ruled this out for its 50% 2030 target.	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Mars's two short-term targets meet 1.5°C Paris Agreement-aligned milestones for the food and agriculture sector identified in existing literature. Teske (2022, p. 328) describes that between 2019 and 2030, the food and agriculture industry should reduce its scope 3 emissions by 34%. Mars specifies that it does not plan to use land sequestration carbon dioxide removals for the realisation of its 2030 target. The company's 2030 target goes beyond the benchmarks identified for the sector, and Mars has a short-term target for 2025 that corresponds with its 2030 target too.		Mars's lack of targets for the period 2031-2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022).		**We find that Mars's 2050 target meets 1.5°C Paris Agreement aligned milestones for food and agriculture sector.** Teske (2022, p. 328) identifies 1.5°C-aligned absolute emission reduction milestones for various emission sources of agricultural activities, which represent upstream scope 3 emissions for Mars. All energy-related emissions need to reduce 100% by 2050, whereas AFOLU emissions and non-CO_2 emissions need to reduce by 42% by 2050 below 2019 levels. In sum, these required reductions mean a reduction of 51% across all scopes, below 2019 levels. Mars's implied emission reduction commitment aligns with this. The Transition Pathways Initiative (TPI) derives an emission intensity per tonne of agricultural input aligned with '1.5°C' trajectories by 2050: 0.414 tCO_2/tonne agricultural input (Dietz *et al.*, 2022, p. 13). This represents an 85% reduction in intensity compared to 2.751 tCO_2/tonne agricultural input in the 2020 base year. Due to a lack of information on intensity and volumes of agricultural input, we cannot directly assess whether Mars's implied emission reduction commitment meets these intensity benchmarks. Moreover, TPI specifies that their benchmarks are developed for human food only, and Mars's products are only partially for human consumption. However, Mars's emission reduction target alongside its 2050 net-zero target contribute to the shift that is signalled by the required change in intensities. Boehm *et al.* (2023) describe emission reduction requirements of 29% for enteric fermentation and 39% for manure management, both below 2017 levels. Mars's emission reduction target goes beyond these levels. We cannot evaluate Mars's target against SBTi's FLAG Guidance and Net Zero Standard for this assessment due to the lack of specificity on the role of emission reductions vis-à-vis land sequestration CDR in those guidances, towards aligning with 1.5°C-compatible transition pathways for the sector. There are high uncertainties regarding the permanence and potential of CDR within the agrifood value chain. We evaluate Mars's implied emission reduction target reasonable rather than high because of the lack of interim targets on five-year intervals, as per the recommendations of the UN High Level Expert Group on Net Zero (ISO, 2022; UN HLEG, 2022).	

Nestlé

Short-term targets towards 2030	Poor	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Unclear
→ What are the targets and what do they actually mean?					
Nestlé pledges to reduce its emissions by 20% by 2025 and 50.4% by 2030, compared to a 2018 baseline, and to reduce its FLAG emissions by 50% by 2030. **We interpret that the pledge to reduce emissions by 50.4% by 2030 which translates to only 16%-24% emission reductions compared to the company's full value chain emissions in 2019.** In its Net Zero Roadmap (Nestlé, 2023b), Nestlé presents its interim emission reduction targets compared to a business-as-usual scenario and shows the targeted emission levels for each emission source for 2030. We calculate from the figures presented in the company's Net Zero Roadmap (Nestlé, 2023b) that the company actually commits to reduce its full emission footprint from 116 $MtCO_2e$ in 2019 to between 91-97 $MtCO_2e$ in 2030. This would represent a reduction of just 16-24% of the company's full value chain emissions. The stark difference between this range and the 50% target communicated by Nestlé lies in the company's exclusion of various emission sources from its pledge, as well as the inclusion of measures for land sequestration and technical carbon removal and storage which Nestlé accounts as negative emissions. The range of 16-24% is due to different potential interpretations of the unclearly defined measures to 'transform the product portfolio', through which Nestlé states that it plans to 'reduce future emissions growth' by 6 $MtCO_2e$ (Nestlé, 2023b, p. 21). The upper end of the 16-24% range is based on the optimistic assumption that the 6 $MtCO_2e$ refers to further emission reductions across several emission sources and compared to 2019 levels. However, the ambiguous presentation of this measure in the Net Zero Roadmap could also refer to a 6 $MtCO_2e$ reduction compared to unspecified future emissions growth, which may not lead to any further emission reductions compared to 2019 levels.		Nestlé sets no emissions reduction target for the medium-term towards 2040 (2031–2040).		Nestlé's headline pledge of net-zero GHGs by 2050 includes a commitment to reduce emissions by 90% across its entire value chain compared to 2018 levels, and to reduce its scope 3 FLAG emissions by 75% compared to 2018 levels (SBTi, 2023e). These targets include both reductions and removals. **Due to an undefined role of land sequestration carbon dioxide removals, Nestlé's emission reduction commitment remains unclear.**	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Nestlé's 2030 medium-term targets neither meet cross-sectoral nor sector-specific 1.5°C Paris Agreement-aligned decarbonisation milestones. The majority of Nestlé's emission footprint derives from agricultural emissions. In the absence of available benchmarks from scientific literature for mixed-good retailers, we compare Nestlé's 16-24% emission reductions by 2030 to available 1.5°C-aligned benchmarks for agriculture, and cross-sector global benchmarks. Global cross-sectoral benchmarks require GHG and CO_2 emissions to reduce by 43% and 48% between 2019 and 2030, respectively (IPCC, 2022). Pathways for global agriculture and food sector in Teske *et al.* (2022, p. 328) indicate that scope 3 emissions should reduce by at least 34% between 2019 and 2030. Although the 50% reduction communicated by Nestlé would appear to align the company with these benchmarks, our interpretation of Nestlé's target translates to just a 16-24% reduction of the full value chain emissions in 2019 means that Nestlé's plans fall far short of any of these benchmarks. The SBTi published its guidance for Forest, Land, and Agriculture (FLAG) in 2022. Although the FLAG guidance requires companies to commit to annual reductions of at least 3.03%, translating to reductions of 30.3% between 2020 and 2030 (SBTi, 2022a, pp. 44–45), this includes land sequestration CDR. We cannot use the FLAG guidance for this assessment due to the lack of specificity on the role of emission reductions vis-à-vis land sequestration CDR, towards aligning with 1.5°C-compatible transition pathways for the sector.				We are unable to compare Nestlé's 2050 targets to sectoral 1.5°C-aligned benchmarks as the exact target ambition remains unclear, due to an undefined role of land sequestration carbon dioxide removals.	

Nike

Short-term targets towards 2030	Reasonable	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Reasonable
→ What are the targets and what do they actually mean?					
Nike has set out two interim emission reduction targets: • Reduce scope 1 and scope 2 by 65% below 2015 levels by 2030. • Reduce scope 3 by 30% below 2015 levels by 2030. This target excludes indirect emissions from the use phase of products (scope 3 category 11). These targets jointly translate to a reduction of 41% by 2030 across the entire value chain below 2019 levels. To estimate the implied reduction in Nike's targets, we consider their whole value chain emissions excluding indirect use phase emissions, which are calculated using the larger scope 2 estimate, which in Nike's case is the location-based estimate. However, because Nike's targets clearly state that it only plans to reduce its market-based scope 2, we calculate the scope 2 emission reduction based on the market-based estimate, and then tally up that reduction against Nike's full value chain emissions.		No targets identified.		Nike's long-term pledge includes a commitment to reach net-zero GHG emissions by 2050. Alongside its pledge, Nike commits to reducing its full value chain emissions (scope 1, 2, and 3) by 90% below 2015 levels. This target represents a **reduction of 91% by 2050 below 2019 levels**. Since the net zero pledge entails a commitment to deep decarbonisation across the entire value chain, we consider that the net zero terminology is unlikely to be misleading. Net-zero targets can give consumers and investors the impression that the company aims to reach deep levels of emission reductions, which Nike has committed to.	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Nike's commitments for reductions across the value chain are close to meeting 1.5°C-aligned milestones identified in existing literature. According to the IPCC's global economy-wide benchmarks to keep warming below 1.5°C, GHG emissions should reduce by 43% by 2030, compared to 2019 (IPCC, 2022). Given that emissions in the fashion industry occur in various sectors, including agriculture and energy, we expect the industry to decarbonise at the same speed as this global trajectory. Nike's targets, which represent a 41% reduction, are close to this global benchmark. The company's 2030 scope 3 target is almost aligned with other 1.5°C-compatible sectoral benchmarks. Nike's scope 3 target of a 30% reduction below 2015 levels translates to a 40% reduction of scope 3 emissions below 2019 levels. This falls just short of sectoral benchmarks, which require a reduction of upstream supply chain emissions of at least 41% by 2030. Teske (2022) considers that between 2019 and 2030, the textile and leather industry and the manufactured fibres and synthetic rubber industry should reduce their GHG emissions by 41% and 46%, respectively. This covers all emissions associated with producing fabrics and other materials and manufacturing the clothes, in other words: Nike's upstream scope 3 emissions.		Nike's lack of targets for the period 2031-2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022).		**Nike's 2050 target seems to be aligned with 1.5°C-compatible sectoral benchmarks.** Teske (2022) considers that between 2019 and 2050, the textile and leather industry and the manufactured fibres and synthetic rubber industry should reduce their scope 1 GHG emissions by 100%, scope 2 by 100%, and scope 3 by 48%. Nike's implied target of reducing their whole value chain emissions by 91% below 2019 levels seems to meet these benchmarks, although some uncertainties remain on whether the company's target meets these benchmarks for all scopes. To clarify this, Nike could publish further details on how they plan to achieve their 2050 target, including reaching 100% renewables in their supply chain, and fully addressing emissions from manufacturing of their products from tier 2 to tier 4 suppliers.	

Stellantis

Short-term targets towards 2030	Moderate	Medium-term targets for the period 2031-2040	Reasonable
→ What are the targets and what do they actually mean?			
Stellantis commits to an overarching intensity emission reduction target of 50% by 2030 across the entire value chain, compared to 2021 levels. The overarching interim target is supported by the following absolute and intensity targets, all using a 2021 base year: • To reduce absolute scope 1 and 2 emissions by 50% by 2025 and by 75% by 2030. • To reduce scope 3 emission intensity by 50% by 2030. • To sell 100% BEVs for passenger cars in Europe and 50% BEVs for passenger cars and light-duty trucks in the US by 2030. • To reduce the emission intensity of purchased parts per BEV by 40% by 2030 Due to the company's recent formation, we cannot recalculate the targeted emission reductions compared to a 2019 base year.		Stellantis' headline pledge of carbon net zero by 2038 includes a commitment to reduce the emissions intensity across its vehicles' life cycle by at least 90% across its entire value chain, compared to 2021 levels. Stellantis will subsequently offset less than 10% of its 2021 emissions by 2038. Due to the company's recent formation, we cannot recalculate the targeted emission reductions to a 2019 base year.	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?			
Stellantis' 2030 targets meet some of the 1.5°C Paris Agreement-aligned milestones for automobile manufacturers' downstream scope 3 emissions, as identified in existing literature (CAT, 2020, p. 27; UNFCC Race to Zero, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023d, pp. 88, 93). To stay within the 1.5°C temperature limit, sales of electric LDVs — those with zero tailpipe emissions — should reach 67%–95% by 2030 globally (CAT, 2020, p. 27; Boehm *et al.*, 2023, pp. 77-78; IEA, 2023b, pp. 88, 93). In Stellantis' main markets such as the European Union and the US, electric LDV sales should reach 95%–100% by 2030 and 100% by 2035 in all leading markets (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4). The company only meets these benchmarks for its target to sell 100% EVs in the EU by 2030 but fall short for its target of 50% in the US. In the US market, Stellantis aims to reach 100% by 2038 only. Apart from the core targets for the EU and US markets, the company has not committed to any further phase-out dates for internal combustion engines in other sales markets or other vehicle categories, such as light commercial vehicles. Stellantis presented aspirational EV sale shares by 2030 for the Middle East and Africa regions, Brazil, India and the Asia Pacific region, and China, as part of its strategic blueprint Dare Forward 2030 published in 2022 (Stellantis, 2022). These indicative targets miss the 1.5°C-compatible sectoral benchmarks for Brazil, India, and China (CAT, 2020, p. 27). The targeted sale shares are: • >25% share of LEVs in the Middle East and Africa regions. • ~20% share of LEVs in Brazil (compared to 45-95% for all LDV sales being electric by 2030 in the 1.5°C-aligned scenarios). • ~50% share of BEVs in India and the Asia Pacific region (compared to 80-95% for all LDV sales being electric by 2030 in the 1.5°C-aligned scenarios, including two- and three-wheelers). • 60% of share of passenger car BEVs in China (compared to 95-100% for all LDV sales being electric by 2030 in the 1.5°C-aligned scenarios, including two- and three-wheelers). Stellantis no longer claims that its scope 3 emissions 2030 targets are aligned with SBTi. Instead, it refers to the SBTi's guidance on the transport sector for its scope 1 and 2 targets, which it claims are aligned with a 1.5°C scenario (Stellantis, 2023, p. 113).		**Stellantis' 2038 targets meet some of the 1.5°C Paris Agreement-aligned milestones for automobile manufactures.** The automobile industry should only sell electric vehicles by 2030–2035 globally to comply with the 1.5°C-compatible decarbonisation milestones (CAT, 2020, p. 27; Boehm *et al.*, 2021, pp. 77–78; UNFCCC, 2021, pp. 10–11; IEA, 2022a, p. 27; Teske *et al.*, 2022, p. 4). Stellantis does not explicitly commit to this specific benchmark for its entire vehicle fleet sold globally by 2040. Instead, it focuses on certain markets, such as the EU by 2030 and the US by 2038, which were responsible for 76% of all sales in 2022 (Stellantis, 2023b, p. 37). We could not identify regional reduction trajectories aligned with the 1.5°C.	

Tesco

Short-term targets towards 2030	Very poor	Medium-term targets for the period 2031-2040	Poor	Long-term targets for the period beyond 2040	Moderate
➔ What are the targets and what do they actually mean?					
Scope 1 and 2, base year 2015: • Reduce emissions by 85%, by 2030 (voluntary target) Tesco's short-term targets **equate to emission reductions of 1% compared to 2019 value chain emissions.**		Scope 1 and 2, base year 2015: • Reduce emissions by 83%, by 2032 • Reduce emissions by 90%, by 2035 Scope 3, base year 2019: • Reduce non-FLAG emissions by 55%, by 2032 • Reduce FLAG emissions by 39%, by 2032 Tesco medium-targets equate to emission reductions of 27-45% compared to 2019 value chain emissions, but the role of land sequestration carbon dioxide removals remains unclear. The range is related to uncertainties around the exact scope coverage of the medium-term targets. Tesco reports higher emissions for scope 3, category 11 (use of sold products) and lower emissions for category 3 (fuel and energy-related activities), than the company reports in its baseline emissions of the targets. Both the lower and higher end of the range includes the presented baseline emissions for category 3, rather than the lower reported emissions. For the lower end of the range, we use the reported emissions for category 11, and apply the reported coverage share on those emissions. We assume the share of emissions not covered under target to stay constant. The higher range of the emissions uses the same coverage share that Tesco reports, but applies it on the reported baseline emissions.		Net-zero emissions by 2050. Scope 3, base year 2019: • Reduce non-FLAG emissions by 90%, by 2050 • Reduce FLAG emissions by 72%, by 2050 Tesco commits to emissions reduction targets of at least 90% by 2050 below 2019 levels for non-FLAG emissions in scope 3, and 72% for FLAG emissions in scope 3. The targets equate to emission reductions of 63-74% compared to 2019 value chain emissions. To determine this range, we applied the same methodological steps as explained for the medium-term targets.	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Due to the lack of scope 3 targets, Tesco's short-term emission reduction commitment is far below a 1.5°C trajectory for the sector and can be considered to be of low significance in the context of the company's full GHG emission footprint. Teske (2022, p. 328) describes that between 2019 and 2030, the food and agriculture industry should reduce its scope 3 emissions by 34%. Overall, the company's 2030 target does not align with this benchmark. Boehm *et al.* (2023) describe emission reduction requirements of 17% for enteric fermentation and 21% for manure management, both below 2017 levels. Tesco does not meet these emission reduction levels with its 2030 target. The SBTi published its guidance for Forest, Land, and Agriculture (FLAG) in 2022. Although the FLAG guidance requires companies to commit to annual reductions of at least 3.03%, translating to reductions of 30.3% between 2020 and 2030 (SBTi, 2022b, pp. 44–45), this includes land sequestration carbon dioxide removals. We cannot use the FLAG guidance for this assessment due to the lack of specificity on the role of emission reductions vis-à-vis land sequestration CDR, towards aligning with 1.5°C-compatible transition pathways for the sector. If we were to include the 30.3% benchmark, Tesco's short-term targets would also not align with this benchmark due to its negligible emission reduction commitment.		Due to the limited scope coverage and limited ambition, Tesco's range of short-term targets do not meet 1.5°C Paris Agreement-aligned milestones for the food and agriculture sector identified in existing literature.		**Tesco's target for non-FLAG emissions is close to 1.5°C benchmarks, but the meaning of its target for FLAG emissions is unclear.** Tesco's targets for non-FLAG emissions, accounting for two-thirds of its emissions footprint, reflect a commitment to deep emission reductions, but fall short of 1.5°C benchmarks for the sector. Teske (2022, p. 328) identifies 1.5°C-aligned absolute emission reduction milestones for various emission sources of agricultural activities, finding that all energy-related emissions need to reduce 100% by 2050. However, since Tesco claims to fully align its strategy with the SBTi FLAG guidance, there is a substantial likelihood that the company will depend on extensive land sequestration carbon dioxide removal in the value chain for realising its targets for FLAG emissions. We do not consider this an adequate approach to claim neutralisation of emissions, among other reasons, due to high uncertainties regarding permanence and potential. Due to the lack of clarity on the extent to which the FLAG target will be achieved through real emission reductions, we consider that there is effectively a lack of any specific commitment for reducing these FLAG emissions. We also do not identify clear signals from the company's measures or other target that would suggest that there is a clear plan to embark on the agricultural transitions that would be necessary to significantly reduce agricultural emissions, especially methane and nitrous oxide.	

Toyota

Short-term targets towards 2030	Very poor	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Very poor
→ What are the targets and what do they actually mean?					
Toyota commits to the following emission reduction targets by 2030: • Scope 1 & 2: 30% absolute emissions reduction from scope 1 and 2 by 2025 (below 2013 levels, without allowing offsets to meet the target). • Scope 3 – Category 11 • 30% CO_2 emissions intensity reduction per kilometre for passenger light-duty vehicles and light commercial vehicles by 2025 for Japan, United States, Europe, China, Canada, Brazil, Saudi Arabia, India, Australia, Taiwan, Thailand, and Indonesia (below 2010 levels, not allowing for offsets to meet the target) • 33.3% CO_2 emissions intensity reduction per vehicle kilometre for passenger light-duty vehicles and light commercial vehicles by 2030 (below 2019 levels, without allowing offsets to meet the target). • 11.6% CO_2 emissions intensity reduction per vehicle kilometre for medium and heavy freight trucks by 2030 (below 2019 levels, without allowing offsets to meet the target). • All emissions scopes across the value chain • 18% GHG emissions intensity reduction per vehicle across scope 1, 2 and 3 emissions by 2025 (below 2013 levels, without allowing offsets to meet the target) • 30% GHG emissions intensity reduction per vehicle across scope 1, 2 and 3 emissions by 2030 (below 2019 levels, without allowing offsets to meet the target) Toyota has also set a target to reach a 50% sales share of electric vehicles by 2030 and only sell zero-emissions vehicles by 2035 for the European Union and the United Kingdom (Toyota Europe, 2021, 2023a). In a written submission to the House of Lords Environment and Climate Change Committee, Toyota Europe suggested that 100% zero emission vehicle sales would be expected in the United Kingdom (Toyota Europe, 2023a, p. 5). We cannot independently quantify Toyota's interim intensity targets in terms of absolute emission reduction by 2030. Toyota has disclosed to CDP that its 2030 target for LDVs is equivalent to an estimated 23.1% reduction of absolute emissions from scope 3 category 11, and its 2030 target for HDVs is equivalent to an estimated 0.5% (Toyota, 2023d). This CDP disclosure is not publicly available, and the assumptions that underpin the estimate are not clear (e.g., for sales volumes assumed in 2030).		Toyota commits to the following emission reduction targets by 2035: • Scope 1 & 2 • 68% absolute emissions reduction by 2035 across scope 1 and scope 2 emissions (below 2019 levels, without allowing offsets to meet the target). • Carbon neutrality for CO_2 emissions from production plants' scope 1 and scope 2 emissions by 2035 (no base year, with offsets allowed to meet target) • Downstream Scope 3 – Category 11: 50% CO_2 emissions intensity reduction per kilometre for new vehicles by 2035 (below 2019 levels, without allowing offsets to meet the target). Toyota's 2035 absolute emissions reduction target for scope 1 and 2 is equivalent to less than a 1% emission reduction by 2035 below 2019 levels across the entire value chain. We cannot independently quantify Toyota's 2035 interim intensity targets for scope 3 emissions.		Toyota – as well as subsidiary Hino, which produces heavy-duty vehicles – aim to achieve carbon neutrality by 2050, but neither Toyota nor Hino commit to a specific emissions reduction target alongside this pledge. Since the company's carbon neutrality pledge does not entail any explicit commitment to deep decarbonisation, labelling it as a 'carbon neutrality target' may be misleading and commits to the following scope-specific pledges by 2050: • Scope 1 & 2 • Carbon neutrality for GHG emissions from corporate activities by 2050 • Zero CO_2 emissions from production plants' scope 1 and scope 2 emissions by 2050 • Downstream Scope 3 – Category 11: Carbon neutrality for average GHG emissions per vehicle by 2050 • All emissions scopes across the value chain: Carbon neutrality for GHG emissions per vehicle by 2050 across scope 1,2 and 3 emissions	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Light-duty vehicles **Toyota's 2030 interim targets do not meet 1.5°C Paris Agreement-aligned milestones for automobile manufacturers' downstream scope 3 emissions, as identified in existing literature** (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). Sales of electric light-duty vehicles with zero tailpipe emissions should reach 67%–95% by 2030 globally to stay below the 1.5°C warming limit (CAT, 2020; Boehm *et al.*, 2023; IEA, 2023c). In Toyota's main markets such as the European Union, China and the US, electric LDV sales should reach 95%–100% by 2030 and 100% by 2035 across all leading markets (CAT, 2020; UNFCCC, 2021; IPCC, 2022; Teske *et al.*, 2022). The company significantly falls short of the global 1.5°C-aligned benchmarks for 2030, and it provides no market-specific phase-out dates for internal combustion engines. Toyota's target to reach a 50% sales share of electric vehicles by 2030 in the EU and the UK reflects the automobile sector's business-as-usual development for Europe, rather than a 1.5°C-compatible climate ambition going beyond this. The IEA estimates that the EV sales share for Europe will reach around 50% under its stated policies and announced pledges scenario (IEA, 2023b, p. 114). We cannot identify such targets for its other key markets. Toyota aims to sell 3.5m BEVs globally by 2030 (Toyota, 2023b). Toyota still refers to the SBTi's 'Below 2°C' validation of its scope 3 emissions intensity target (Toyota, 2023b). However, SBTi has indefinitely paused the use of its methodology for automakers, citing its incompatibility with the 1.5°C temperature limit (SBTi, 2022f). The Transition Pathway Initiative (TPI) does not deem the company's 2030 targets for downstream scope 3 emissions as aligned with its Below 2 Degrees Scenario benchmark (TPI, 2023a). The TPI's assessment compares its Below 2 Degree Scenario benchmark of below 81 gCO_2e/vkm and its 1.5 Degree benchmark of below 31 gCO_2e/vkm to its interpretation of Toyota's 2030 target of 90 gCO_2e/vkm. **Heavy-duty vehicles** **We cannot independently assess Toyota's climate targets for heavy-duty vehicles against existing 1.5°C-aligned benchmarks.** While Toyota and Hino commit to intensity reduction targets for the heavy-duty vehicles' use phase emissions at the group and subsidiary level, respectively, the companies provide no explanation on how these targets relate to each other. We cannot directly compare Toyota's intensity per vehicle-km targets this to existing intensity benchmarks expressed in emissions per tonne kilometres, which define 1.5°C-compatible emission intensities from the use of heavy-duty trucks as of 30–61 gCO_2 per tonne kilometres by 2030 (IEA, 2023c; Teske *et al.*, 2023 data provided in Dataset 2). However, Toyota estimates that this will reduce total scope 3 emissions only by 0.5% by 2030 below 2019 levels (Toyota, 2023d). We cannot identify targets for the phase-in of zero emission heavy-duty vehicles by 2030, neither at the group level by Toyota nor at the subsidiary level by Hino. Recent literature indicates that the 1.5°C Paris Agreement-compatible shares should be 30–37% of battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) heavy-duty trucks in global annual sales by 2030 (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93).		Toyota's 2035 interim targets do not meet 1.5°C Paris Agreement-aligned milestones for automobile manufacturers' downstream scope 3 emissions for light-duty vehicles, as identified in existing literature (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). All light-duty vehicle (LDVs) sales should be electric—that is, have zero tailpipe emissions—by 2035 in key markets such as Japan, the European Union, China and the US to stay below the 1.5°C warming limit (CAT, 2020, p. 27; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). The company only provides market-specific internal combustion engines (ICE) phase-out dates for the European Union and the United Kingdom, where Toyota has set a target to only sell zero-emissions vehicles by 2035 (Toyota Europe, 2021, 2023a). We could not identify such targets for its other key markets. Toyota has not signed the non-legally binding declaration committing to a fully electric fleet by 2035 to support achieving the 1.5°C target of the Paris Agreement, despite competing manufacturers signing up to it (COP26 Presidency, 2021; A2Z Coalition, 2023).		We find the absence of any post-2040 emission reduction target alongside Toyota's carbon neutrality goal highly insufficient, especially considering the urgent need for deep and credible emission reductions towards mid-century to have a reasonable chance of limiting global warming to 1.5°C (IPCC, 2022) . To align with the 1.5°C-compatible decarbonisation milestones, the automobile industry should transition to selling only electric vehicles globally by 2030–2035 (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). In 2022, downstream emissions from the use of sold vehicles amounted to around 76% of Toyota's emissions in 2022, but the company has not committed to any phase-out dates for internal combustion engines across its different brands in the context of its carbon neutrality pledge.	

Volkswagen Group

Short-term targets towards 2030	Poor	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Very poor
➔ What are the targets and what do they actually mean?					
Volkswagen Group commits to the following emission reduction targets towards 2030: • 30% intensity emissions reduction per kilometre for new passenger cars and light-duty vehicles by 2030 (below 2018 levels, without allowing offsets to meet the target). • 50.4% absolute emissions reduction by 2030 across scope 1 and scope 2 emissions (below 2018 levels, without allowing offsets to meet the target). The Volkswagen Group further communicates several targeted sales shares for electric light-duty vehicles by 2030: • at least 70% in the European Union • at least 50% in the United States and China The Volkswagen Group states that these targets represent minimum requirements for the Group's brands. Each brand may set additional targets going beyond the group-level targets for this timeframe (Volkswagen, 2023, p. 47). While Volkswagen does not commit to group-level targets for heavy-duty vehicles, each of the four brands under its subsidiary Traton sets its own targets (Traton, 2023a, pp. 17, 23, see also *Box 1* in the written assessment). Volkswagen's 2030 absolute emissions reduction target for scope 1 and 2 is equivalent to a 3% emission reduction by 2030 below 2019 levels across the entire value chain. We cannot independently quantify Volkswagen's interim intensity targets for scope 3 emissions. Volkswagen has disclosed to CDP that this target is equivalent to an estimated 6% reduction of absolute emissions from scope 3 category 11 (Volkswagen, 2023a). This CDP disclosure is not publicly available, and the assumptions that underpin the estimate are not clear, for example for sales volumes assumed in 2030. Volkswagen no longer refers to any group-wide short-term targets towards 2030 within a five-year interval in its latest sustainability reporting of 2023 (Volkswagen, 2023b, 2023c, 2023a). Previously, the company had set a 2025 intensity reduction target for CO_2 emission of new vehicles that explicitly relied on an unspecified amount of offsets (Volkswagen, 2022, pp. 26, 46).		Volkswagen sets no emissions reduction targets for medium-term towards 2040 (2031–2040). Some of Volkswagen's brands like Audi or Volkswagen Passenger Cars do communicate aspirational sales shares for electric light-duty vehicles for their respective brands (Waldersee, 2022; Audi, 2024). For example, Audi intends to gradually phasing out the production of combustion engines by 2033 (Audi, 2024). Volkswagen Group does not present them as integral part of their group-level climate strategy.		The Volkswagen Group aims to achieve carbon neutrality by 2050, but does not commit to a deep emissions reduction target alongside its 2040 net-zero pledge. Since the company's carbon neutrality pledge does not entail any explicit commitment to deep decarbonisation, labelling it as a 'carbon neutrality target' may be misleading. Volkswagen's subsidiaries – Scania, MAN and Porsche – have further committed to own long-term net-zero and carbon neutrality targets by 2040 or beyond (Volkswagen, 2023b, p. 47).
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Light-duty vehicles Volkswagen's 2030 interim targets do not meet the 1.5°C Paris Agreement-aligned milestones for automobile manufacturers' scope 3 emissions from the use of light-duty vehicles (LDVs), as identified in existing literature (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). Sales of electric LDVs, with zero tailpipe emissions, should reach 67%–95% by 2030 globally to stay below the 1.5°C warming limit (CAT, 2020; Boehm *et al.*, 2023; IEA, 2023c). In Volkswagen's main markets such as the European Union, China and the US, electric LDV sales should reach 95%–100% by 2030 and 100% by 2035 across all main markets (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4). The Volkswagen Group commits to reach at least a 50% electric vehicle share by 2030 in the US and China, and at least 70% in the European Union (Volkswagen, 2023c, p. 8). These three markets jointly represent 85% of all vehicles sales in 2022 (Volkswagen, 2023d, p. 128). The company significantly falls short of the global 1.5°C-aligned benchmarks for 2030, and it provides no market-specific phaseout dates for internal combustion engines. The Volkswagen Group still refers to the SBTi's '2°C' verification of its scope 3 emissions intensity target (Volkswagen, 2023b, p. 47). However, SBTi has indefinitely paused the use of its methodology for automakers, citing its incompatibility with the 1.5°C target (SBTi, 2022f). The Transition Pathway Initiative (TPI) does not deem the company's 2030 targets for downstream scope 3 emissions as aligned with its Below 2 Degrees Scenario benchmark (TPI, 2023b). The TPI's interpretation of Volkswagen's 2030 target of 114 gCO_2e/vkm falls significantly short of its Below 2 Degree Scenario benchmark (lower than 81 gCO_2e/vkm) and its 1.5 Degree benchmark (lower than 31 gCO_2e/vkm). **Heavy-duty vehicles** Volkswagen produces heavy-duty trucks and buses through its subsidiary Traton. Traton manages four different vehicle brands: Scania, MAN, Navistar, and Volkswagen Truck & Bus. The 2030 targets by Traton's four brands mostly meet 1.5°C Paris Agreement-aligned milestones for downstream scope 3 emissions of heavy-duty vehicle manufacturers, as identified in existing literature (UNFCCC, 2021, pp. 10–11; Mission Possible Partnership, 2022, p. 40; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). MAN, Scania and Navistar International Cooperation — covering 26 out of Volkswagen Group's 28 production sites for heavy-duty vehicles — all pledge to reach at least 40% sales share of heavy-duty zero-emission vehicles (ZEVs) by 2030 (Traton, 2023a, p. 17). These commitments are in line with the global 1.5°C-compatible shares for heavy-duty trucks of 30–37% of battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) by 2030 (UNFCCC, 2021; Boehm *et al.*, 2023; IEA, 2023c). Trucks represented 83% of all heavy-duty vehicle sales by Traton in 2022 (Traton, 2023b). Volkswagen Truck & Bus —Volkswagen Group's fourth brand producing heavy-duty vehicles in Brazil — has not committed to any target to increase the sales share of heavy-duty vehicles.		Volkswagen's absence of targets for the period 2031-2040 neglects the need for interim targets to chart a trajectory towards the company's long-term vision, as recommended by the UN High Level Expert Group on Net Zero (UN HLEG, 2022).		We find the absence of any post-2040 emission reduction targets alongside Volkswagen Group's carbon neutrality goal highly insufficient, especially considering the urgent need for substantial and credible emission reductions towards mid-century to have a reasonable chance of limiting global warming to 1.5°C (IPCC, 2022). To align with the 1.5°C-compatible decarbonisation milestones, the automobile industry should transition to selling only electric vehicles globally by 2030–2035 (CAT, 2020, p. 27; UNFCCC, 2021, pp. 10–11; Teske *et al.*, 2022, p. 4; WBA, 2022; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). In 2022, downstream emissions from the use of sold vehicles constituted around 74% of Volkswagen's emissions, but the company has not committed to any phase-out dates for internal combustion engines across its different brands in the context of its carbon neutrality pledge.

Volvo Group

Short-term targets towards 2030	Reasonable	Medium-term targets for the period 2031-2040	Unclear	Long-term targets for the period beyond 2040	N/A
→ What are the targets and what do they actually mean?					
Volvo Group commits to the following emission reduction targets by 2030 below 2019 levels: • 50% absolute emissions reduction across scope 1 and scope 2 emissions. • 30% absolute emissions reduction from use of construction equipment (part of scope 3 category 11 emissions) • 40% CO_2 emissions intensity reduction per vehicle kilometre for heavy-duty trucks • 40% CO_2 emissions intensity reduction per vehicle kilometre for buses Apart from these emission reduction targets, Volvo Group commits to selling "at least" 35% of electric vehicles by 2030 (Volvo Group, 2023a, pp. 16, 151). Volvo Group's 2030 absolute emissions reduction target for scopes 1 and 2 is equivalent to less than a 1% reduction by 2030 below 2019 levels across the entire value chain. We cannot independently quantify Volvo Group's interim intensity targets for scope 3 emissions.		**The Volvo Group aims to achieve net-zero emissions across the entire value chain by 2040, but does not commit to a deep emissions reduction target alongside its 2040 net-zero pledge.** Since the company's carbon neutrality pledge does not entail any explicit commitment to deep decarbonisation, labelling it as a 'carbon neutrality target' may be misleading. In addition, the company commits to an 37.5% absolute emissions reduction by 2034 from the use of sold industrial and marine engines as part of its scope 3 category 11 emissions.		**Volvo Group communicates no additional emission reduction targets for the long-term beyond 2040.** For this reason, the issues discussed around the Volvo Group's 2040 net-zero target and its indicative electric vehicle shares under an 'illustrative scenario for 1.5°C' similarly apply for the period beyond 2040 *(see assessment above)*.	
→ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
The Volvo Group's 2030 interim targets mostly meet 1.5°C Paris Agreement-aligned milestones for heavy-duty vehicle manufacturers' downstream scope 3 emissions, as identified in existing literature (UNFCCC, 2021, pp. 10–11; Mission Possible Partnership, 2022, p. 40; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). Volvo Group commits to selling "at least" 35% of electric vehicles by 2030 (Volvo Group, 2023a, pp. 16, 151). However, the company does not further differentiate between heavy-duty trucks, buses, and other construction equipment and industrial machinery. For heavy-duty trucks, recent literature identifies the 1.5°C Paris Agreement-compatible range of 30–37% battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) sold by 2030 globally (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). Volvo Group's target, if applied to heavy-duty trucks responsible for 66% of the company's revenue in 2022, would thus meet this benchmark range. For buses, the 1.5°C Paris Agreement-compatible sales share of BEVs and FCEVs must reach between 56–60% by 2030 globally and 100% by 2030 in advanced economies and China (UNFCCC, 2021; IPCC, 2022; Boehm *et al.*, 2023; IEA, 2023c) Volvo Group's target, if applied to buses responsible for 4% of the company's revenue in 2022, would fall short of this benchmark range.		**We cannot independently assess Volvo Group's medium-term targets towards 2040 against existing 1.5°C-aligned benchmarks for the heavy-duty vehicle sector.** Unlike for 2030, Volvo Group provides no specific target share for electric vehicles by 2040 but rather shows indicative shares under an "illustrative scenario for 1.5°C" (Volvo Group, 2023a, pp. 16, 155). This includes an unspecified share of internal combustion engines using sustainable biofuels and other fossil-free fuels. For heavy-duty trucks, recent literature identifies the 1.5°C Paris Agreement-compatible shares of battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) of 100% by 2040 in advanced economies and China (UNFCCC, 2021, pp. 10–11; Boehm *et al.*, 2023, pp. 77–78; IEA, 2023c, pp. 88, 93). We further consider the lack of an emission reduction target alongside Volvo Group's group-wide 2040 net-zero target as insufficient, considering the need for deep and credible emission reductions towards mid-century to stand a reasonable chance of limiting global warming to 1.5°C (IPCC, 2022).		

Walmart

Short-term targets towards 2030	Very poor	Medium-term targets for the period 2031-2040	Very poor	Long-term targets for the period beyond 2040	Very poor
➔ What are the targets and what do they actually mean?					
Walmart committed to the following emission reduction targets for 2030: • Scope 1 and scope 2: 35% emission reduction by 2025 from 2015. • Scope 1 and scope 2: 65% emission reduction by 2030 from 2015. Walmart's short- and medium-targets translate to reducing emissions by 5% by 2030, compared to 2019 value chain emissions.		Walmart committed to **zero emissions in operations by 2040** (scope 1 and 2). We estimate that Walmart's emission reduction target is **equivalent to a commitment to reduce around 9% of its emissions across the value chain by 2040**, compared to 2019 levels. Walmart's 2040 target covers only scope 1 and scope 2 emissions, which account for approximately 9% of the company's GHG emission footprint in 2019.		Walmart sets no emissions reduction target for the long-term beyond 2040 (from 2041 onwards).	
➔ Is this emission reduction commitment in line with 1.5°C-compatible trajectories or benchmarks for the sector?					
Walmart's scope 3 emissions account for 95% if its emission footprint. In the absence of available benchmarks from scientific literature for mixed-good retailers, we compare Walmart's 5% emission reductions by 2030 to available 1.5°C-aligned benchmark. Walmart's 2030 medium-term targets neither meet cross-sectoral nor sector-specific 1.5°C Paris Agreement-aligned decarbonisation milestones. Teske (2022, p. 328) describes that between 2019 and 2030, the food and agriculture industry should reduce its scope 3 emissions by 34%. Walmart's short-term targets falls far short of this benchmark. The SBTi published its guidance for Forest, Land, and Agriculture (FLAG) in 2022. Although the FLAG guidance requires companies to commit to annual reductions of at least 3.03%, translating to reductions of 30.3% between 2020 and 2030 (SBTi, 2022b, pp. 44–45), this includes land sequestration carbon dioxide removals. We cannot use the FLAG guidance for this assessment due to the lack of specificity on the role of emission reductions vis-à-vis land sequestration CDR, towards aligning with 1.5°C-compatible transition pathways for the sector. If we were to include the 30.3% benchmark, Walmart's commitments would fall far short of it.		We consider the lack of any post-2030 emission reduction commitments for scope 3, alongside Walmart's targets for scope 1 and 2 as highly insufficient, considering the need for deep and credible emission reductions towards mid-century to stand a reasonable chance of limiting global warming to 1.5°C (IPCC, 2022).			

Annex III – Additional assumptions for Part A analysis

The aggregated impact analysis across the 20 companies' climate strategies assessed in Section A of the *Corporate Climate Responsibility Monitor 2024* contains several assumptions that are *additional* to the assumptions presented in the individual company assessments in Section B. These additional assumptions concern the interpretation of corporate intensity targets for automobile manufacturers. Several companies commit to intensity targets for the period up to 2030 that cannot directly be translated into absolute emission reduction commitments. To give a most optimistic scenario of the emission reductions that companies' emission reductions could lead to, we present aggregated findings with the scenario that companies' *intensity* targets will lead to an equivalent emissions reduction in *absolute* terms. In other words, we present the scenario that activity levels remain constant until 2030. We consider that this aggregated scenario is highly optimistic and unlikely in some cases; accordingly, we do not use this optimistic scenario for the company-specific integrity assessments in Section B, where we evaluate companies' real commitments.

Stellantis

We interpret Stellantis' intensity targets for 2030 (50% by 2030 below 2021 across all value chain emissions) as an absolute target, assuming constant activity levels.

Toyota

For the upper bound estimate, we assume that Toyota's *intensity* targets are equivalent to *absolute* emission reduction targets. For this purpose, we interpret Toyota's intensity targets for light-duty vehicles (LDVs) for 2030 (33.3% by 2030 below 2019 for downstream scope 3 use phase emissions) as an *absolute* target, assuming constant activity levels. Similarly, we interpret Toyota's intensity targets for heavy-duty vehicles (HDVs) for 2030 (11.6% by 2030 below 2019 for downstream scope 3 use phase emissions) as an *absolute* target, assuming constant activity levels. Together with Toyota's absolute target for scope 1 and 2 (30% by 2025 below 2013), these targets jointly translate into a 26% absolute reduction by 2030 below 2019 levels across the entire value chain.

For the lower bound estimate, we use the estimate provided by CDP for Toyota's 2030 LDV and HDV intensity target, which indicates an estimated 23.1% reduction of absolute emissions from scope 3 category 11 for LDVs and a 0.5% reduction for HDVs (Toyota, 2023d). It is important to note that the CDP disclosure is not publicly available, and the assumptions underpinning the estimate are unclear (e.g., for sales volumes assumed in 2030). When combined with Toyota's absolute target for scope 1 and 2 (30% by 2025 below 2013), these targets jointly translate into a 17% absolute reduction by 2030 below 2019 levels across the entire value chain.

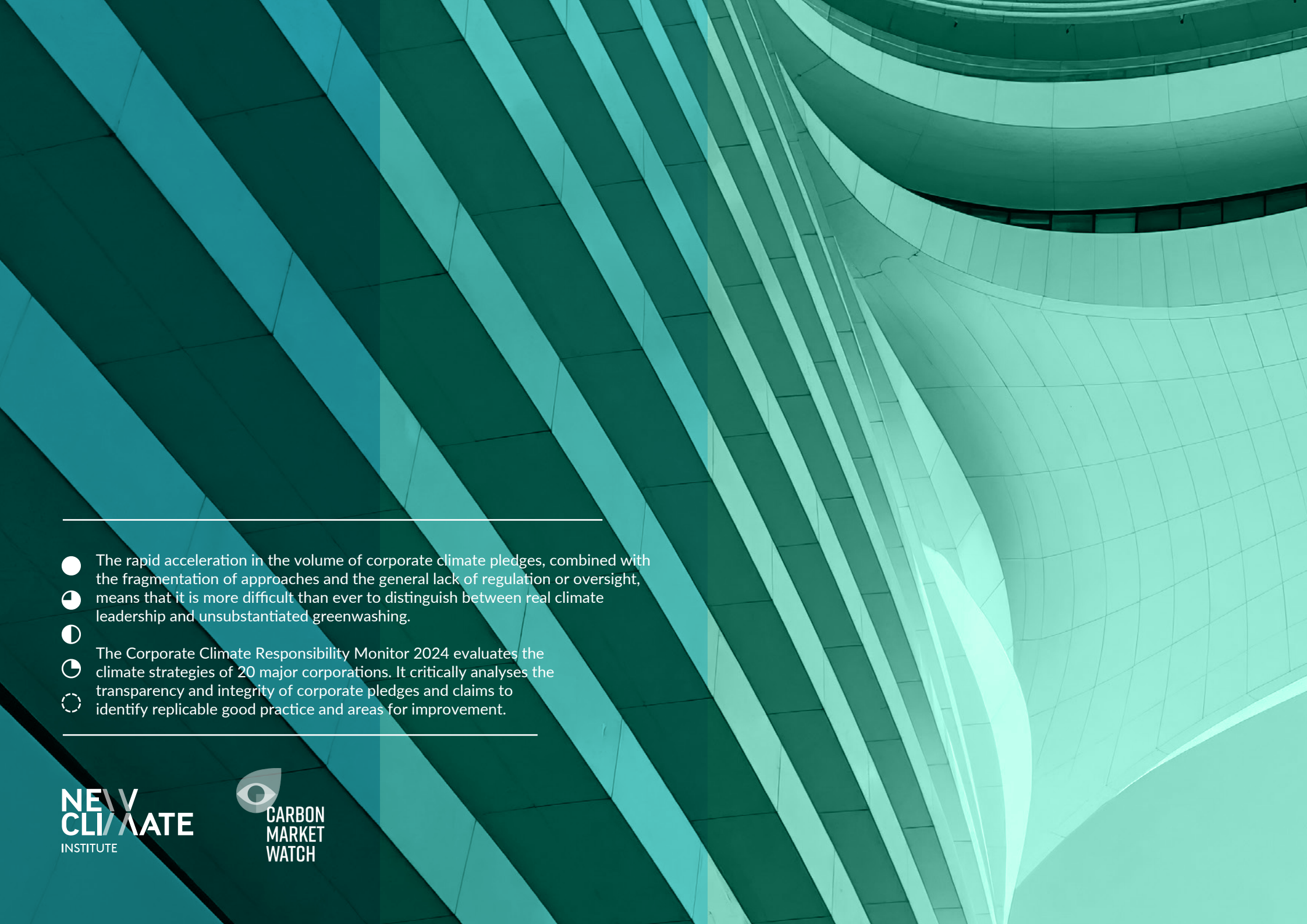
Volkswagen

For the upper bound estimate, we assume that the Volkswagen's *intensity* targets are equivalent to *absolute* emission reduction targets. For this purpose, we interpret Volkswagen's *intensity* targets for LDVs for 2030 (30% by 2030 below 2018 for downstream scope 3 use phase emissions) as an *absolute* target, assuming constant activity levels. While neither Volkswagen nor Traton set group-level targets for HDVs, the brands Scania (20% intensity reduction per vehicle km by 2025 below 2015), MAN (28% intensity reduction per vehicle km by 2030 below 2019) and Navistar (24–25% gCO_2e/ton mile by 2027 below 2017) do so at the brand level. We assume these translate into a 20% intensity reduction across all HDV brands below 2019 levels and, subsequently, an *absolute* target assuming constant activity levels. Together with Volkswagen's absolute target for scope 1 and 2 (50.4% by 2030 below 2018), these targets collectively translate into a 23% absolute reduction by 2030 below 2019 levels across the entire value chain.

For the lower bound estimate, we follow the same approach for HDVs as outlined above but use the estimate for Volkswagen's 2030 LDVs *intensity* target disclosed by CDP, which indicates an estimated 6% reduction of absolute emissions from scope 3 category 11 for LDVs (Volkswagen, 2023a). It is important to note that the CDP disclosure is not publicly available, and the assumptions underpinning the estimate are unclear (e.g., for sales volumes assumed in 2030). When combined with Volkswagen's absolute target for scope 1 and 2 (50.4% by 2030 below 2018), these targets jointly translate into a 13% absolute reduction by 2030 below 2019 levels across the entire value chain.

Volvo Group

We interpret Volvo Group's *intensity* targets for trucks and buses for 2030 (40% by 2030 below 2019 for downstream scope 3 use phase emissions each) as an *absolute* target, assuming constant activity levels. Together with Volvo Group's *absolute* target for scope 1 and 2 (50% by 2030 below 2013), the use phase of emissions of construction equipment (30% by 2030 below 2019) and the use phase of emissions from industrial and marine engines (37.5% by 2034 below 2019), these targets jointly translate into a 35% absolute reduction by 2030 below 2019 levels across the entire value chain.



The rapid acceleration in the volume of corporate climate pledges, combined with the fragmentation of approaches and the general lack of regulation or oversight, means that it is more difficult than ever to distinguish between real climate leadership and unsubstantiated greenwashing.

The Corporate Climate Responsibility Monitor 2024 evaluates the climate strategies of 20 major corporations. It critically analyses the transparency and integrity of corporate pledges and claims to identify replicable good practice and areas for improvement.

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