



Truckmakers' hidden carbon problem

Why indirect emissions from truck manufacturers are a major financial risk

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Executive summary

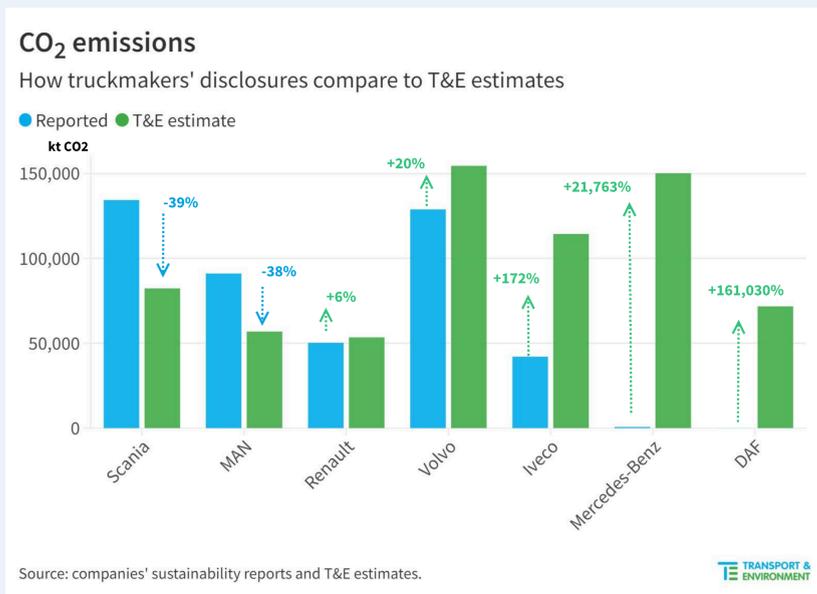
On April 10th, Europe finalised a new law to clean up CO₂ emissions from heavy-duty vehicles (HDVs). The law mandates truck and busmakers to sell an increasing share of zero-emission vehicles starting from 2025, crowding out the space for diesel sales until a near phase-out in 2040. This offers an immense opportunity for truckmakers to clean up their CO₂ emissions, and to continue to attract private capital.

A single diesel truck in Europe burns 450,000 litres of fuel during its lifetime, the same as 30 cars. Today 97.2% of HDV sales are diesel, which massively inflates the scope 3 emissions of vehicle manufacturers. T&E calculates that **99.8% of truckmakers' total emissions come from its scope 3**, mostly stemming from the so-called “use of sold products”. This will soon become a financial problem for them. From the 2024 financial year, all large EU companies - including truckmakers - have to publicly disclose their scope 1, 2 and 3 emissions.

This paper looks at the various tools available today to assess the carbon footprint of individual assets in the truck industry. We look at the seven top market players (Volvo, Scania, Renault, MAN, IVECO, Daimler Truck and DAF) and in particular at their scope 3 emissions, the E-pillar in their ESG ratings, and their alignment with the EU taxonomy. In addition, we delve into the role that investors and regulators can play in curbing emissions from road freight.

Our findings can be summarised as follows:

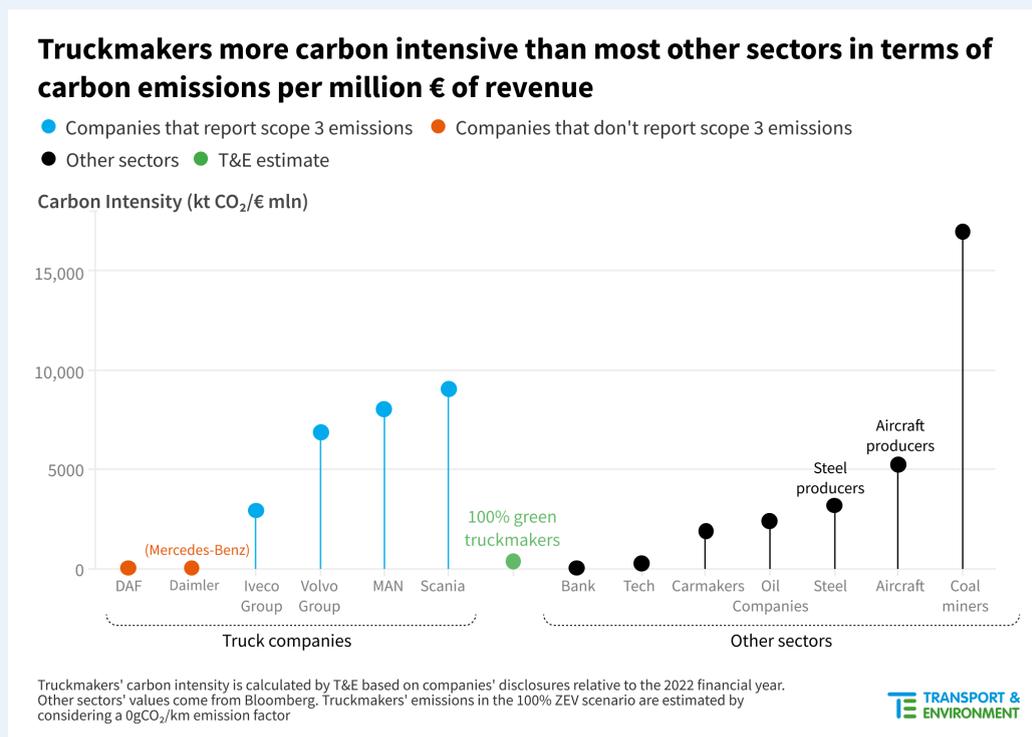
1. In the absence of regulation guidelines on how to report on greenhouse gas (GHG) emissions, some truck manufacturers currently underreport on the emissions coming from the vehicles they sell, or omit this impact category entirely. From our estimates, **emissions are on average 53% higher than what the top seven truckmakers currently report.**



This will soon need to change. From 2024, new EU regulations on full emissions and Taxonomy alignment disclosure oblige all truckmakers to report on their scope 3 emissions. Our analysis shows the need for public scrutiny on the methodology that will be used. Detailed and accurate reporting should take place at group, entity and brand level to ensure full transparency on the impacts of produced trucks.

2. Transparency on scope 3 emissions will start nudging investors towards the least carbon intensive investments. That creates risks for truckmakers to raise private capital. Truck manufacturers are currently the most polluting companies in terms of carbon emissions per million euro of revenue, more polluting than carmakers or oil companies. However, the **new HDV CO₂ standards will cut truckmakers' emissions (scope 1, 2 and 3) by 29% by 2030.**

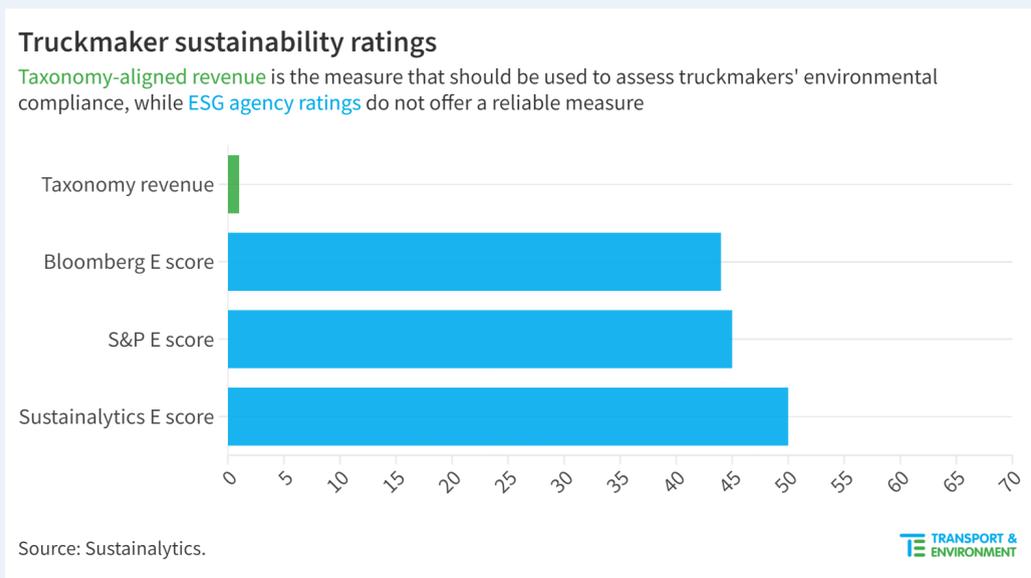
Public announcements by manufacturers show that an even faster ramp-up of zero-emission vehicle supply is possible. **Based on transparent reporting, investors should now pressure truckmakers to deliver on these voluntary plans. This would further reduce their emissions by 60% by 2030.** Investors can invoke pressure through public statements and engagement strategies, with divestment from non-compliant companies as a last resort option. Pension funds, crucial for sustainable futures, should align financial planning with environmental responsibility.



3. **ESG ratings are not a sound measure of a company's environmental impact** and should not be used as benchmarks by investors seeking to decarbonise their portfolios. Despite their carbon intensity, truckmakers all get good scores from the rating agencies analysed. In April

2024, EU policymakers reached an overall solid compromise and adopted the long-awaited ESG ratings regulation - the first ever attempt to regulate the ESG rating market at EU level. The deal reached will enhance the transparency of ESG ratings and is a milestone to ensure that they become true sustainability ratings. Now, **it will be critical to ensure a sound implementation of the regulation to allow investors to make more informed decisions.** Until then, investors looking to make their portfolios more sustainable should adopt the EU Taxonomy instead to better account for the environmental impacts of their investees.

4. **The EU Taxonomy should be used instead**, as it better reflects a company's true environmental performance. Despite the greenwashing of gas, aviation and shipping, the Taxonomy provides sound criteria when it comes to road transport. Taxonomy scores highlight revenues generated by sustainable activities, such as zero-emission vehicles. Where truckmakers score extremely low under the EU Taxonomy today, with 97.2% of HDV sales being diesel, the new HDV CO₂ standards will push them to rapidly increase their investments into zero-emission vehicles. Overperforming on these emissions targets in line with their voluntary announcements will allow them to further upgrade their Taxonomy scores and increasingly become recipients of sustainable financing.



1. Introduction

Demand for zero-emission vehicles (ZEVs) in the freight transport market is increasing rapidly. In the face of climate urgency, businesses are urged to swiftly decarbonise their operations, while consumers increasingly incorporate sustainability considerations into purchasing decisions. Battery electric and fuel-cell hydrogen powertrains emit no tailpipe greenhouse gases, and electricity is becoming the cheapest power source for all road freight before 2030.¹ Despite their numerous advantages, clean vehicles currently represent only a tiny share of total heavy-duty sales in Europe: only 2.8%,² far behind electric cars (14.8%).³ A new, pioneering EU regulation will incentivise truck manufacturers to progressively sell more ZEVs, starting from 2025, and crowd out the space for diesel sales until a near phase-out in 2040. The seven major European players in the heavy-duty vehicle manufacturing market (Volvo Trucks, Scania, Renault Trucks, MAN, IVECO, Daimler Truck, DAF) have started to invest in zero-emission vehicles. Meanwhile however, their diesel vehicle production is still increasing.⁴

Battery and fuel-cell electric powertrains are currently still more expensive to produce compared to diesel trucks, as this rather new technology requires partial readapting of manufacturers' existing factories. This considerably lowers the profit margins on those vehicles. While continuing to sell internal combustion engines might be a safe short-term strategy for manufacturers to maximise their gains, this poses a serious threat to the environment. A new long-haul truck sold today in the European Union is estimated to stay on the road for an average of 18 years and drive up to 1.5 million km. During this period, it burns 450,000 litres of diesel and emits 1,200 tons of carbon dioxide (CO₂).⁵ This is unsustainable, especially as transport activity is expected to increase considerably (+40% in 2050⁶ compared to 2020) and so is the heavy-duty fleet.

The EU's seven major truckmakers are however boasting of being at the forefront of sustainability in their annual reports and public communication. This allows them to obtain both generous environmental scores from prominent rating agencies and large funding from investors, who believe they are contributing to fighting climate change when looking at their sustainability reporting. This study looks into how CO₂ emissions are managed and reported by each of these seven major European manufacturers. We compare their sustainability disclosures against real-world evidence and come out with a more realistic assessment of some of these companies' impact on the climate. The study also explores how the European industry and regulation must change to speed up the transition to a clean road freight system.

¹ ICCT (2023). *A total cost of ownership comparison of truck decarbonisation pathways in Europe*. [Link](#).

² ACEA (2024). *Press release, commercial vehicles 2023*. [Link](#).

³ Sales share refers to September 2023. Source: ACEA. [Link](#).

⁴ As heavy-duty activity is increasing, production of vehicles is rising too - independent of powertrain. This allowed diesel truck sales to rise by 22% (+12% for buses) in the first three quarters of 2023 compared to the previous year, despite the increase in the electric ones.

⁵ Estimates resulting from T&E's in-house modelling. More details can be found in the Annex.

⁶ Source: EU Reference Scenario 2020. [Link](#).

2. Champions of pollution

A company's sustainability is generally judged based upon its **ESG rating** (Environmental, Social, and Governance). These ratings are based on information on the amount of CO₂ the company emits, how it manages air pollution and water reserves, as well as the well-being of its employees. But the world of ESG data is undeniably complex, making it challenging to judge sustainability practices accurately. Some companies are able to make hazy or even false sustainability claims in their annual reports, and still get rewarded with good ESG scores.

Amid this chaos, a framework that attempts to offer clarity and consistency is the widely recognized international standard '**Greenhouse Gas Protocol**' (GHG Protocol). It provides guidelines for quantifying and reporting greenhouse gas emissions, and categorises emissions into three scopes:

- **Scope 1:** Direct emissions from sources that are controlled or owned by a company, such as on-site fuel combustion for its operations.
- **Scope 2:** Indirect emissions originating from a company's energy use, e.g. associated with purchased electricity, heating, and cooling.
- **Scope 3:** Other indirect emissions, including those in the upstream and downstream value chain, such as supply chain and product lifecycle emissions. In the context of truckmakers, scope 3 emissions are mostly made of this last category - i.e. the CO₂ trucks emit during their life through fuel combustion.

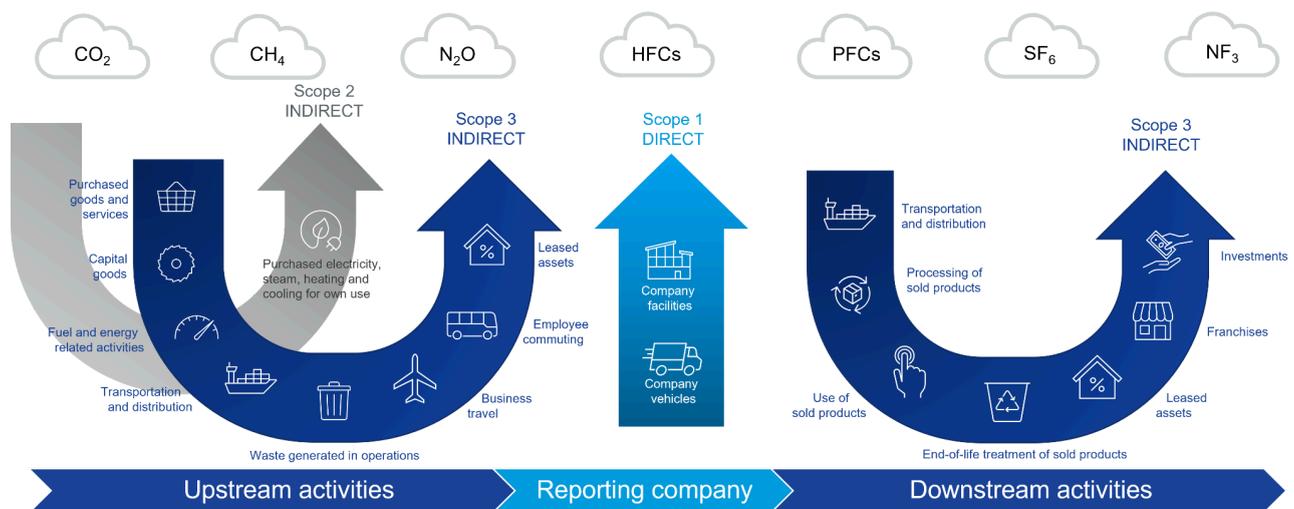


Figure 1: GHG emissions scope breakdown.⁷

2.1. Scope 3 mandatory for truckmakers and investors under new EU rules

Adoption of the GHG Protocol is currently voluntary. The absence of a standardised methodology for companies to calculate their emissions, coupled with the associated costs, often deters full

⁷ Source: Ricardo.

compliance. But omitting to report on emissions across all three scopes or using proprietary criteria can potentially yield results that are significantly divergent from the actual environmental impact. These issues are about to be addressed, through new EU regulations on both companies and financial institutions.

Companies based in the EU - or with significant business in the EU⁸ - are required to disclose their ESG performance under the EU's **Corporate Sustainability Reporting Directive (CSRD)**. Supplementing that directive, the European Sustainability Reporting Standards (ESRS) mandate⁹ large companies to also disclose their scope 1, 2 and 3 CO₂ emissions starting from the financial year 2024. This will significantly empower investors with better tools for evaluating their investee companies' true environmental performance. In addition, the EU's new Regulatory Technical Standard supplementing the **Sustainable Finance Disclosure Regulation (SFDR)** also mandates financial institutions to fully disclose their scope 1, 2 and 3 emissions from 2024 on 2023 data.

The introduction of mandatory reporting for scope 3 emissions is a significant shift. It is set to pose a considerable challenge for truckmakers and financial institutions alike. Reporting requirements for investors will make them more interested in financing those companies that already have, or are working towards, lower emissions across all three scopes. Truckmakers will face increased scrutiny, making it challenging not to increase their zero-emission sale shares - more rapidly.

2.2. True emissions of truckmakers 53% above currently reported

Table 1 below gives an overview of the current reporting on, and targets set for, each of the GHG scopes by the seven dominant players in the European heavy-duty vehicle market: Volvo, Renault, MAN, Scania, Iveco, Mercedes-Benz (Daimler), and DAF.

While today all major EU truckmakers already report on their scope 1 emissions, and most manufacturers (except DAF) report on scope 2 emissions, the picture is much more diverse for scope 3 reporting. Mercedes-Benz Trucks did not report on its scope 3 emissions in its most recent sustainability report (2022), while DAF neglected to report on both scope 2 and 3.¹⁰ Iveco reports incompletely on scope 3, informing the public on only one of the fifteen reporting categories required under scope 3 (although the main one, see figure 1 above). The Volvo Group, which owns both Volvo

⁸ The CSRD applies to large European companies already subject to the Non-Financial Reporting Directive (more than 500 employees), large European companies with more than 250 employees and annual turnover above €50 million, European listed SMEs, and non-EU companies with significant business in the EU (annual turnover of above EUR 150 million in the EU).

⁹ The Directive and the standards that supplement it (ESRS) leave the disclosure of the sustainability information subject to companies' materiality assessment, meaning that they will evaluate which indicators to report on according to their activities' relevance. For the purposes of this report T&E considers that Scope 3 emissions will be deemed relevant for truck manufacturers and therefore mandatory to disclose. In general, for transition plans and scope 3 GHG emissions the Directive foresees a binding "comply or explain" approach, whereby companies must provide an explanation if the information is deemed not material.

¹⁰ The company vaguely mentions some "Other indirect emissions" without further explanation. Paccar, the parent company of DAF, reports its scope 2 and 3 emissions. However, it does not disclose any information that could be used to infer DAF's emissions.

Trucks and Renault Trucks, reports only aggregate scope 3 emissions for the entire Group, although they provide clear information on how to split these emissions across its business units. While truckmakers Volvo and Renault are indeed listed together on the stock market, the TRATON Group does manage to report separately on each of its brands, thereby increasing transparency on the individual performance of its EU brands MAN and Scania.

In terms of target setting, most manufacturers focus on scope 1 and 2, with more ambitious targets. All but DAF however still set a scope 3 target, with only Daimler being more ambitious on scope 3 than on scope 1 and 2.

Company	Reports Scope 1	Reports Scope 2	Reports Scope 3	Scope 1 reduction target	Scope 2 reduction target	Scope 3 reduction target
MAN	Yes	Yes	Yes	-70% by 2030 (vs 2019)	-70% by 2030 (vs 2019)	-28% by 2030 (vs 2019)
Scania	Yes	Yes	Yes	-50% by 2030 (vs 2019)	-50% by 2030 (vs 2019)	-20% by 2030 (vs 2019)
Iveco	Yes	Yes	Only partially	-50% by 2030 (vs 2019)	-50% by 2030 (vs 2019)	-38% by 2030 (vs 2019)
Volvo	Yes	Yes	Only at group level	-50% by 2030 (vs 2019)	-50% by 2030 (vs 2019)	-40% by 2030 (vs 2019)
Renault	Yes	Yes	Only at group level	-50% by 2030 (vs 2019)	-50% by 2030 (vs 2019)	-40% by 2030 (vs 2019)
Mercedes-Benz	Yes	Yes	No	-42% by 2030 (vs 2021)	-42% by 2030 (vs 2021)	60% new sales are ZEV in 2030
DAF	Yes	No	No	No	No	No

Note: While Mercedes-Benz does not set a target for its entire scope 3, we calculate this target would translate into an overall scope 3 reduction of 36-57% by 2030, compared to 2022 (see Annex I for more detail).

Table 1: Summary of truck manufacturers' emissions reporting and reduction targets

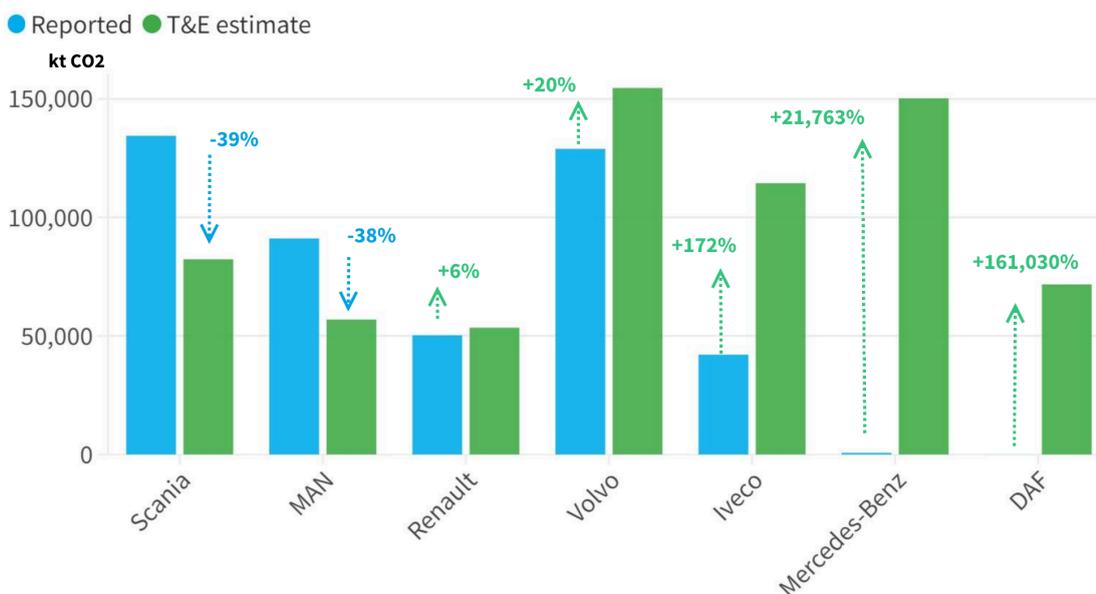
To gauge the accuracy of public emissions reporting by truckmakers, T&E made its own estimation of the magnitude of their scope 3 emissions. We combined information on vehicle fuel consumption as disclosed by the companies themselves with trucking activity as registered by the European Commission. We then compared the results to what companies report. More details on the methodology can be found in Annex I.

Figure 2 shows the difference between reported and estimated emissions. For MAN and Scania, the only two truckmakers that already fully report on their scope 3 emissions, our estimate is lower than what they disclose. For Scania, this is primarily due to the very conservative methodology we adopted, as well as some likely different assumptions on trucks' lifetime mileage and fuel consumption. For

MAN, our estimate is lower as we do not include in our calculations the 21,600 vans they sold in 2022. Estimates for Renault and Volvo look higher than what we could infer from the Volvo Group report.¹¹ Iveco seems to be drastically underestimating its environmental impact, as reported emissions are around one-third of what we estimate. Results for Mercedes-Benz and DAF show how much carbon is hidden from their official reporting.

CO₂ emissions

How truckmakers' disclosures compare to T&E estimates



Source: companies' sustainability reports and T&E estimates.



Figure 2: Scope 3 emissions per company

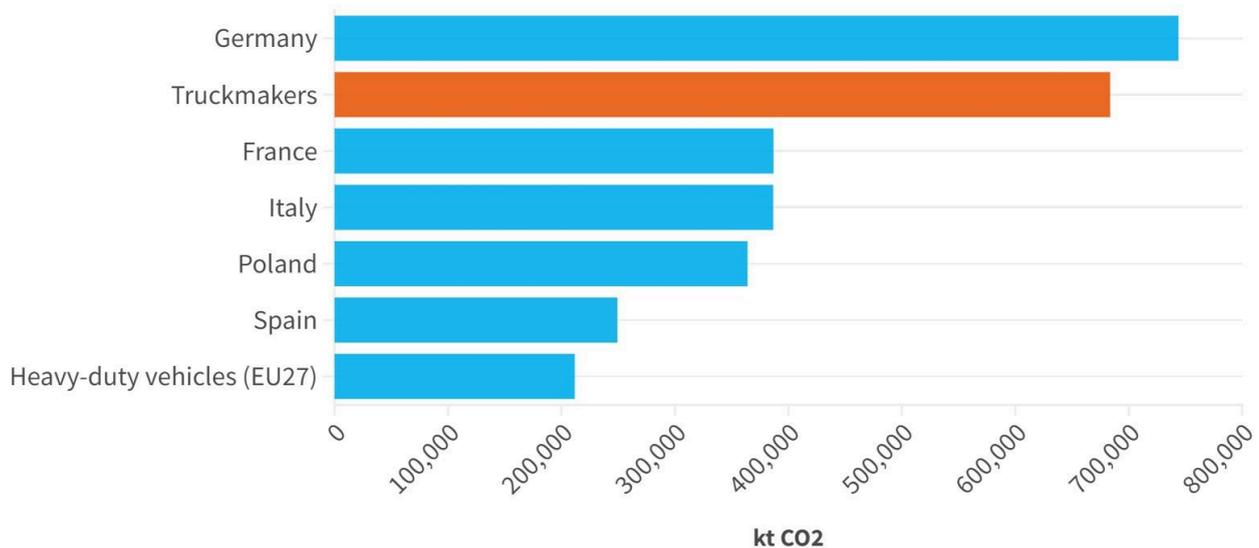
These findings substantially undermine the credibility of truckmakers' current sustainability reports. We found that on average, **scope 3 constitutes 99.8% of truckmakers' total emissions**. At the same time we found that **reporting by truckmakers on this major scope is well below the true level of emissions, which are on average 53% higher than what companies disclose**. Disclosing only scope 1 and 2 emissions accurately becomes futile if the predominant share of emissions, represented by scope 3, is neglected or underreported.

When accounting for their true scope 3 emissions, the seven truckmakers analysed are responsible for around 683 Mt CO₂, more than all European countries except Germany.

¹¹ Adding up the estimated scope 3 emissions of Volvo and Renault, we obtain a slightly lower value than the overall scope 3 emissions declared by the Volvo group. However, the group includes many more brands such as Volvo Penta, Mack Trucks and Prevost Buses. Hence, the total emissions of the Volvo group will be much higher than what was reported.

Truckmakers would be the second highest emitter, if they were a European country

Comparing manufacturers' emissions to those of the largest European countries and yearly emissions from trucks and buses in the EU



Note: Country values refer to total CO₂ equivalent emissions without land use change and forestry in 2022. Source: UNFCCC.



Figure 3: Comparing truckmakers to the EU's top emitting countries

2.3. Carbon intensity of diesel trucks: a material issue for investors

A key metric for investors when assessing a company's environmental performance is its carbon intensity, expressed as tons of CO₂ emitted per million euros of revenue. A low carbon intensity indicates that a company is emitting little CO₂ compared to its economic activities.

We looked at how the score of truckmakers compares to other economic sectors in terms of carbon intensity. The sample aimed at including a heterogeneous pool of sectors to represent the whole financial market: technology, the oil industry, banking, steel and aircraft producers, carmakers, and coal mining. Focusing on the top four revenue-generating companies within these sectors, we calculated their average carbon intensity to perform a comparative analysis.¹²

¹² When performing this cross-industry comparison, we had to consider each truckmaker's official reporting rather than our own emission estimates. This is because we used official reporting for other sectors, and comparing it with estimated data would be inconsistent.

Truckmakers more carbon intensive than most other sectors in terms of carbon emissions per million € of revenue

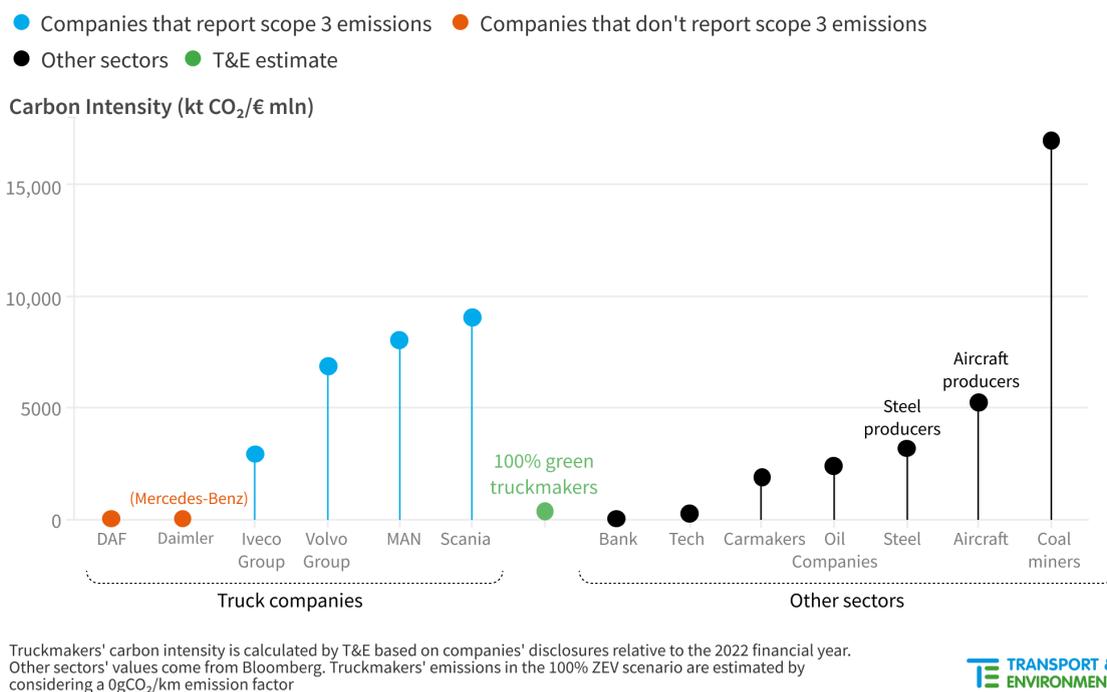


Figure 5: Carbon intensity - cross-sector comparison

Truckmaking emerges as one of the most carbon-intensive industry, only second to coal. Tech companies, steel producers and even oil companies emit less CO₂ compared to their annual revenue. Hence, we can conclude that investing in a truck company is one of the most polluting investments a bank or a fund can make today.

To illustrate how carbon-intensive diesel truck production is as an economic activity, one can draw an analogy with an entire country. Imagine a country where all seven manufacturers are concentrated, and whose exclusive economic activity is the production of trucks and buses. Their combined revenue would equal the country's GDP, and their emissions the country's emissions. In this scenario, the country's GDP would align with that of Luxembourg, yet the emissions would closely rival those of Germany. Such a comparison starkly highlights the disproportionate environmental impact of truckmakers.

Realising this can have far-reaching consequences for investors. When companies start reporting under the CSRD, their true emissions across all scopes will be revealed. Banks and funds owning them will see their carbon footprint increase steeply, mining their credibility as environmentally responsible firms. Hence, the easiest option for them would be to reduce their exposure to avoid the looming threat of this ticking "carbon bomb". That could transform what is today a cornerstone of the European economy into an unpopular investment.

An active engagement strategy from investors however holds better potential to steer change in the industry. **If truckmakers were to exclusively sell ZEVs, these companies would slash their total emissions by up to -95%.** That would transform them from being one of the most polluting investments that can be made into one of the most virtuous players in the market (as illustrated by the green dot in Figure 5 above). While such a full transition will not be realised tomorrow, the increasing share of zero-emission sales as mandated under the new HDV CO₂ standards will already cut truckmakers' emissions by 29% by 2030. Public announcements by manufacturers show that an even faster ramp-up of zero-emission vehicle supply is possible.¹³ Based on transparent reporting, investors should now pressure truckmakers to deliver on these voluntary plans. This would further reduce their emissions by 60% by 2030.

3. Beyond greenwashing: showing the true climate credentials of truckmakers to investors

A central question arises: as part of the data on scope 3 emissions and carbon intensity is already publicly available, why has the combined market capitalisation of EU truckmakers risen by 29% in 2023? Why do they continue to benefit from generous valuations and abundant investments, even from asset owners and managers with a strong commitment to sustainability? The answer lies in the influence of ESG ratings.

Investment portfolios held by major asset owners are highly intricate, comprising thousands of financial products. Due to the sheer quantities, it becomes impractical for these investors to conduct thorough evaluations of the environmental performance of each company they wish to include in their portfolios. Consequently, they rely on ESG ratings. ESG ratings are scores provided by private agencies that offer a synthetic and standardised means of assessing a company's performance across environmental, social, and governance factors. These ratings allow asset owners to make quicker decisions about their investments. By making use of ESG ratings, investors can supposedly align their portfolios with their sustainability objectives without the need for exhaustive individual assessments, such as in-depth investigations into scope 3 emissions of their investees.

However, when examining how ESG rating agencies themselves present these indexes, it becomes evident that **ESG scores are not designed to gauge a company's impact on climate change or other sustainability issues.** Instead, these ratings often only reflect how well a company is managing the sustainability-related financial risks that could affect its profitability, a concept known as *outside-in materiality*. The assessment in this report on the other hand is based on external sustainability factors - such as global warming - that will have a long-term impact on cash flow and, therefore, on any company's ability to operate. Considerations about such *inside-out materiality* are almost completely absent from most ESG ratings, i.e. the external impacts on society and the environment their operations have, like air and water pollution or greenhouse gas emissions.¹⁴

¹³ NOW GmbH (2023). Market development of climate-friendly technologies in heavy road freight transport.

[Link](#)

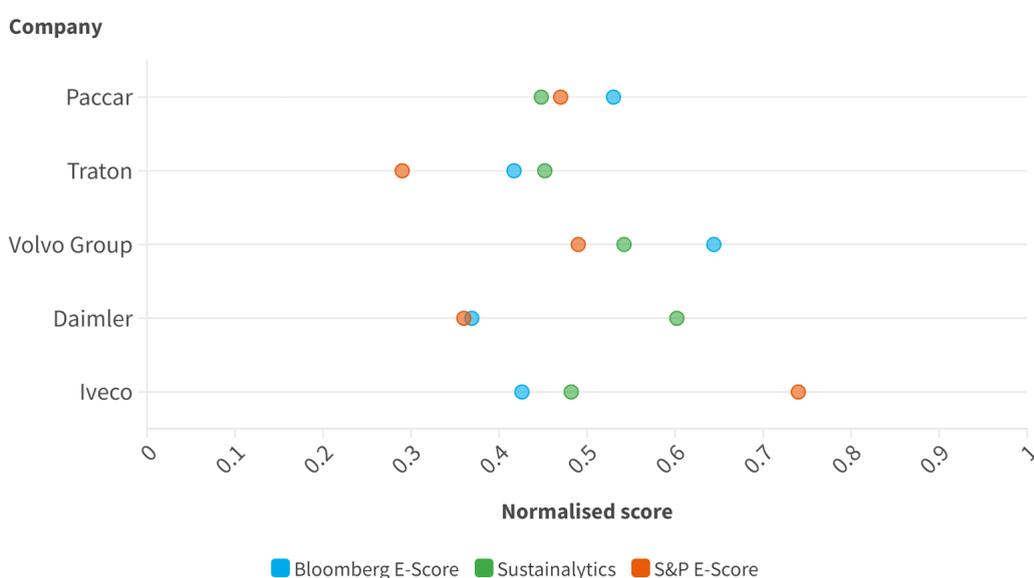
¹⁴ Transport&Environment (2023). *How to improve ESG ratings.* [Link](#).

3.1. Random ESG scoring

T&E analysed three leading ESG rating providers (Bloomberg, Sustainalytics and S&P Global), comparing their methodologies and the scores they assigned to European truck manufacturers. As these raters do not have the same data granularity we used for calculating their carbon intensity, we dug into the reports of the globally active parent companies of the EU's main truck brands: IVECO Group (IVECO), Volvo AB Group (Volvo and Renault), Daimler Truck (Daimler), TRATON (Scania and MAN) and Paccar (DAF). This approach aims to provide a comprehensive perspective on the sustainability assessments of these key players within the industry.

The three rating agencies all adopt different methodologies and scoring systems. Hence, we recalibrated all the scores on a 0-100 scale to be able to compare them.

ESG scores of truckmakers



Note: due to the different measures used by the rating providers, the scores have all been normalised on a 0-100 scale.



Figure 6: Normalised ESG scores.

The chart above reveals three key findings:

1. **Truckmakers receive relatively high sustainability scores:** This may seem counterintuitive given their harmful climate impact. But this reflects the current scope and flaws of ESG scores.
2. **ESG ratings do not adequately consider scope 3 emissions in the ESG's 'E' pillar:** Bloomberg for example allocates less than 3% weight to scope 3 emissions,¹⁵ which proves insufficient to properly reflect the enormous impact these emissions have on climate change, and the power companies have in tackling them. The disproportionately low weighting of

¹⁵ Source: T&E estimates based on Bloomberg disclosures. More details can be found in the Annex.

these emissions within ESG scores stresses the need for a more nuanced and comprehensive evaluation approach. Such an approach should effectively account for a company's entire carbon footprint, encompassing both direct and indirect emissions, to provide a more accurate reflection of its sustainability practices.

3. **There is very little correlation between scores across different providers:** The data points are scattered and span a wide valuation range for each truckmaker. For example, Daimler Truck is the top-performing truckmaker according to Sustainalytics, yet receiving relatively amongst the lowest scores from the other two providers. The large divergence between different rating providers is a well-established fact,¹⁶ where the truckmaking sector is no exception. Although employing different methodologies naturally leads to different results, the inconsistency of ESG ratings is too significant for them to be of any usefulness to investors.

These findings demonstrate how problematic it is to rely exclusively on existing ESG scores as produced by large rating agencies when assessing the environmental performance of companies, particularly those with notable indirect emissions.

Firstly, asset managers can keep marketing investments in truckmakers as aligned with a sustainable finance path, notwithstanding the substantial CO₂ emissions they are effectively financing. The asymmetry of information between managers and clients poses a significant risk, as climate-conscious investors might be misled into supporting environmental destruction under the guise of sustainability.

Secondly, all companies we analysed can claim to be environmentally virtuous if simply picking the right - the most favourable - rating provider, even if the reality contradicts this claim. This causes further confusion among policymakers and regulators, who struggle to establish standardised criteria for robust sustainability reporting. The inconsistency in how companies are assessed can hinder efforts to create a harmonised and widely accepted framework for evaluating and reporting on environmental performance.

3.2. Avoiding misunderstandings

Environmentally aware investors should not use ESG ratings as a metric to evaluate the sustainability profile of their portfolios. To date, these scores contribute to the proliferation of greenwashing practices all over the financial system. Greenwashing occurs when companies or asset managers make exaggerated or misleading claims about their environmental or social responsibility to portray a more favourable image. Upon examining the ratings of truck manufacturers, one might be tempted to label them as environmentally virtuous companies and to integrate them into their ESG funds or portfolios, contrary to the actual reality. This is ultimately legitimising these companies to keep producing polluting diesel vehicles instead of rapidly transitioning to climate-friendly ZEVs.

In the aftermath of the COVID-19 crisis, the financial market has embraced ESG investment as a mainstream practice, with a surge of large asset managers pledging robust commitments to devote

¹⁶ Berg, Kölbel and Rigobon (2019). *Aggregate Confusion: The Divergence of ESG Ratings*. Forthcoming Review of Finance, Available at SSRN: <https://ssrn.com/abstract=3438533>

substantial shares of their capital towards sustainable activities. ESG investing is rapidly going from being a market niche to mainstream. According to a rather conservative evaluation of PwC,¹⁷ global asset managers are set to expand their ESG-related assets under management to \$33.9 trillion by 2026, up from \$18.4 trillion in 2021. This will represent 21.5% of total global Assets Under Management.¹⁸

This shift is driven by increasing awareness of environmental and social issues, along with growing investor demand for ethical and sustainable investment options. Although these commitments are commendable, there is a risk of greenwashing due to the reliance on ESG ratings, coupled with the intricate nature of sustainability-related financial data. In the realm of asset management, it would be highly embarrassing and a serious reputational risk for major players to be investing in polluting or unsustainable activities while outwardly professing their commitment to sustainability. However, most of these companies hold consistent shares of truck companies: BlackRock, Vanguard, State Street Corp, Deutsche Bank, Credit Agricole and JPMorgan Chase all invest in the truck and bus manufacturers analysed in this report.

BlackRock, the world's largest asset manager with \$9.42 trillion in assets under management,¹⁹ states several environmental commitments in their company sustainability report.²⁰ However, their investment strategy does not seem to align with the same level of environmental consideration, despite the announcement in April 2022 that by 2030, at least 75% of its corporate and sovereign assets under management will be invested in issuers with science-based targets or equivalent.²¹

When dealing with the environment and the transition to a low-carbon economy, BlackRock focuses on articulating risks and opportunities for their investors' portfolios. Notably absent from their communication is the impact their investment choices have on the environment. This omission becomes more understandable when examining BlackRock's significant ownership stakes. BlackRock owns 7% of Paccar shares, 2.7% of Daimler and minor shares in all other companies analysed in this report. These investments alone translate into a whopping 27.68 Mt CO₂ financed every year, more than Croatia's entire carbon emissions.²² Powering their offices with 100% renewable energy is a negligible achievement compared to the environmental damage their investments cause.

¹⁷ PwC (2022). *Asset and wealth management revolution: Exponential expectations for ESG*. [Link](#).

¹⁸ Although these figures give a sense of how the investors' attention is shifting towards ESG, it is still worth clarifying that not all of what is labelled as an 'ESG' investment is truly sustainable. The Global Impact Investment Network estimates a more realistic \$1.16 trillion allocated to truly sustainable activities in 2022. [Link](#).

¹⁹ Data as of June 30, 2023.

²⁰ <https://www.blackrock.com/corporate/responsibility/environmental-sustainability>

²¹ <https://reclaimfinance.org/site/en/2022/04/14/blackrocks-2030-emissions-target-promising-ambition-but-the-proof-is-in-the-policy/>

²² Source: UNFCCC. The value refers to 2019 emissions as 2020 is not a reliable reference due to the impact of COVID-19 pandemics.

	Daimler	Volvo	Iveco	Paccar
% of the company held	2.68%	1.76%	2.92%	7.07%
CO ₂ financed (kt)	9,178	10,140	2,906	5,452

Table 2: Shares of BlackRock in key truckmakers. Numbers refer to equity closes as of 19 July 2023

Navigating the complex world of sustainable finance data is undoubtedly hard. However, large asset managers have powerful tools and unique expertise to conduct in-depth analyses of companies' environmental compliance. To better support the transition to a low-carbon economy, as many claim doing, they must better leverage these resources.

A starting point should be to use metrics that are specifically tailored for assessing companies' impact on the environment and the climate. The EU Taxonomy, in force since July 2020, is a classification system developed by the European Union to determine which economic activities are to be considered environmentally sustainable. It sets specific criteria and thresholds to assess whether activities are aligned with the bloc's environmental goal. The Taxonomy is fundamental in providing clarity to investors and businesses about what qualifies as environmentally sustainable. It is designed to help channel capital into activities that align with the EU's environmental objectives, such as achieving carbon neutrality by 2050.

When adopting the EU taxonomy as a benchmark to evaluate the sustainability profile (the 'E' in ESG) of major European truckmakers, a much different - and less rosy - picture emerges compared to ESG ratings.

3.2.1. EU Taxonomy: a tool to better assess the sustainability of truckmakers

The way the Taxonomy works is quite simple: it assesses which share of a company's activities is environmentally sustainable based on six environmental objectives.²³ Sustainable - or Taxonomy-aligned - activities must substantially contribute to at least one of the six objectives, do no significant harm to any other objective, and meet the minimum social safeguard standards based on OECD and UN guidelines. Hence, the focus now shifts to a company's impact on the environment (*inside-out* materiality), as opposed to the ESG rating framework mainly highlighting risks for the company itself (*outside-in* materiality).

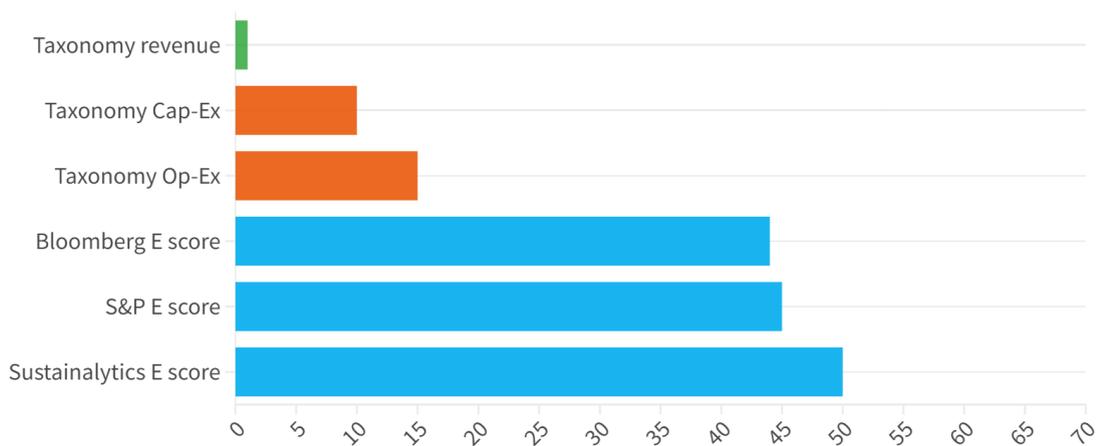
T&E performed an analysis of the Taxonomy scores of truckmakers (see Figure 7 below). To display a synthetic measure of overall compliance, we calculated the average across the companies and compared it to the average ESG scores (Environmental or E-component only). Findings suggest a very different reality from what the ESG ratings were portraying: truckmakers score incredibly low and

²³ The goals are climate change adaptation, climate change mitigation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems.

today cannot be considered sustainable companies at all. The Taxonomy seems to be reflecting much better the environmental harm they cause. The explanation for these low scores is straightforward: as long as a company produces and sells polluting products - which polluting diesel trucks are - it cannot be labelled as sustainable. By contrast, ZEVs are fully sustainable under the Taxonomy, and that is why the share of aligned revenue equals the share of the revenue from ZEV sales. Hence, the way forward for truck and bus makers to improve their score is clear: investing heavily and rapidly into ZEV production.

Truckmaker sustainability ratings

Taxonomy-aligned revenue is the measure that should be used to assess truckmakers' environmental compliance. Cap-Ex and Op-Ex are more generous because they factor in future environmental commitments, while ESG agency ratings do not offer a reliable measure



Source: Sustainalytics.



Figure 7: Taxonomy alignment score for truckmakers compared to ESG ratings, industry average

When looking at capital (Cap-Ex) and operational expenditure (Op-Ex) alignment, the picture is only slightly better. Companies can achieve higher scores by using renewable energy to power their offices or investing in research and development (R&D) for clean technologies, such as electric or fuel-cell powertrains. However, as long as a company's core business is unsustainable, its Taxonomy score will remain low, independent of minor efforts or pledges to appear greener. This is why the Taxonomy is a sound benchmark: it is hard to greenwash it.²⁴

The adoption of the EU Taxonomy as a central indicator for investors is facilitated by the introduction of the above-mentioned Corporate Sustainability Reporting Directive, in force since January 2023 in the EU. It requires inter alia companies to disclose which share of their activity is Taxonomy-aligned. Therefore, **investors will be able to use the Taxonomy alignment of truckmakers as the key metric to assess their 'E' score within their 'ESG' performance.**

²⁴ This is mostly valid in the road transport sector, where EU Taxonomy Technical Screening Criteria are strong. On the contrary, the EU Taxonomy is much weaker in other transport sectors like aviation and shipping ([Link](#)) and the energy sector with the inclusion of gas ([Link](#)).

The increased focus of European Supervisory Authorities on greenwashing in the financial sector is a wake-up call to the financial industry: it is high time to use best-in-class metrics and indicators (like the EU Taxonomy for 'E' impacts) which mitigate the risks of greenwashing.²⁵

4. Towards stronger regulations and investor engagement with truckmakers

We have shown that truckmakers rank among the most polluting companies globally, despite their assertions of environmental responsibility. This hinders the transition to a net-zero economy. It is high time for a step change. ZEVs are the key to curbing CO₂ emissions and fighting climate change, but they need consistent investments to be quickly rolled out on European roads. Unfortunately, truckmakers are not yet mass producing them. To instigate change, two solutions stand out: firstly, heightened pressure from investors demanding sustainable practices, and secondly, the implementation of regulations that both enforce and incentivise the production of ZEVs. These measures are pivotal in fostering a more sustainable and environmentally responsible future.

4.1. Pressure from investors

Shifting private capital towards sustainable activities is a prerequisite for the green transition to take place in Europe and beyond. A major flow of investments is needed for the decarbonisation of the transport sector, in tandem with a new green industrial strategy at EU level. The EU Sustainable Finance strategy, which was developed to flank the European Green Deal, calls on private investors to play a more active role in fostering this transition.

Indeed, investors wield considerable influence over corporate behaviour. If they prioritise environmental considerations, they have the capacity to stop financing polluting activities and demand that truckmakers produce clean vehicles. Institutional investors, investment banks or funds can exert pressure on truckmakers through various channels. As part of this toolbox, they can advocate for positive change through shareholder engagement, by making public statements calling on truckmakers to clean up their act and boost the production of ZEVs. They can also express their commitment to the green transition and vote with their feet - ultimately divesting from companies that are not seriously changing their business plans in light of the climate urgency. In their 2030 net zero statement, BlackRock claims that *"We also engage with the companies in which our clients are invested to promote sound corporate governance and business models necessary to building and sustaining value over time."*²⁶ This statement acknowledges the investors' power over companies' decisions, an influence that must be actively wielded to drive positive change now.

²⁵

<https://www.esma.europa.eu/press-news/esma-news/esas-put-forward-common-understanding-greenwashing-and-warn-risks>

²⁶ BlackRock's 2030 net zero statement. [Link](#).

Calling for an end to environmental threats is also an important act of responsibility for pension funds. Individuals and families diligently saving for their future bear the responsibility to ensure that their financial planning aligns with a sustainable future. Imagine investing in your retirement and discovering that your money is fuelling climate change. The increasing willingness of workers to invest their pension money in sustainable activities is well-documented, but still not accounted for by employers and pension funds.²⁷ For instance, Alecta, a major Swedish pension fund, owns around 4.7% of Volvo shares. The undoubted need to support the domestic industry can be an opportunity for them to push their investee for more ambitious plans on ZEV production, ensuring their customers a sustainable future and competitive returns for many years to come.

The financial community should recognise that the transformation of the heavy-duty industry towards environmental sustainability may not yield immediate profitability. Capital investments in infrastructures and across the value chain will likely keep margins down for a year or two before returning to current levels. However, there is wide consensus among investors that short-termism and the prevailing obsession with quarterly earnings are not compatible with a sustainable world. In a 2019 interview, CERES CEO and President Mindy Lubber admonishes leaders in the business and financial world to look beyond their own noses and take decisions with a long-term perspective.²⁸ This is the only way to preserve the stability of the economic system - she claims - as the impacts of climate change will be disastrous if not tackled urgently and decisively. Financial supervisory authorities and central banks increasingly share this assessment. For years, the European Central Bank has identified climate change as a source of systemic risk, with potentially severe consequences for financial institutions and financial markets alike.²⁹

4.2. CO₂ standards

Regulation is another crucial tool to push truckmakers to produce more ZEVs. EU co-legislators from the Commission, Parliament and Council have just agreed on new CO₂ standards for heavy-duty vehicles. These will lead to an estimated ZEV sales share of at least 31% by 2030, 52% by 2035 and 77% by 2040, up from 2.8% in 2023.³⁰ The new law will offer a tremendous opportunity for truckmakers to clean up their scope 3 emissions. As a result of these increased ZEV sales, by 2030, truckmakers would already slash their scope 3 emissions by at least 29%.

As much progress as the new CO₂ standards represent, they still fall short of what is needed to deliver on the EU's commitment to decarbonise its entire economy by 2050. The standards will only result in a reduction of the emissions from HDVs by 62% by 2050.³¹ Truckmakers have however made more ambitious ZEV sales announcements than the standards will legally bind them to. On average, they

²⁷ Scottish Widows (2022). *Green Pensions Report - 2022*. [Link](#).

²⁸  Ceres CEO and President Mindy Lubber on crossing the sustainability-investor chasm

²⁹ <https://www.ecb.europa.eu/pub/financial-stability/fsr/html/ecb.fsr202205-f207f46ea0.en.html>

³⁰ The HDV CO₂ standards set emissions reduction targets, not ZEV sales shares. These numbers represent T&E's calculations of what the agreed CO₂ targets of -45% by 2030, -65% by 2035 and -90% by 2040 will deliver in terms of zero-emission vehicles sold in each of those compliance years. See also footnote 2.

³¹ Compared to 1990.

plan to increase the ZEV sales share to 63% by 2030.³² Such an overperformance on the legal requirements would allow them to slash their scope 3 emissions even further by 2030, by a whopping 60%. Investors should therefore hold truckmakers accountable for these announcements and require them to deliver on these promises in exchange for being included in their investment portfolio in the future.

5. Conclusions and recommendations

ZEVs are the only solution to decarbonise heavy-duty transport. The technology is readily available, and consumers are willing to adopt it. However, truckmakers are currently only starting to ramp up the production of battery electric and hydrogen-powered vehicles. Today, scope 3 emissions still represent a staggering 99.8% of truckmakers' total GHG emissions. This makes them the champions of pollution in terms of carbon emissions per million euros of revenue.

It is imperative for investors and regulators alike to take swift action and exert the necessary pressure on European truckmakers to accelerate their transition to zero-emission technology. This will also help safeguard the long-term competitiveness of Europe's trucking industry. Concretely, T&E proposes the following recommendations to policy-makers and investors:

1. **Truckmakers need to disclose their entire GHG emissions, including their scope 3 emissions**, as mandated by new EU regulations on full emissions (SFDR and CSRD) and the EU Taxonomy alignment disclosure obligations. Detailed and accurate reporting should take place at group and brand level to ensure full transparency on the impacts of produced vehicles.
2. **Truck manufacturers should deliver on their voluntary ZEV sales announcements**, thereby overperforming on the legal obligations under the CO₂ standards. Truckmakers are currently the most polluting companies in terms of carbon intensity, more polluting than carmakers or oil companies. With mandatory scope 3 reporting kicking in in 2024 under the SFDR, investors will see the carbon footprint of their portfolios spike, and likely focus on more sustainable investments. They must thus urgently ensure they become more attractive investments.
3. **Investors should use their financial leverage and communicate to truck manufacturers to more rapidly scale up** investment in zero-emission technology. If truckmakers' were to realise their own sales plans, they would further reduce their scope 3 emissions by 60% by 2030. Institutional investors, banks, and funds can become a driver for change through public statements and engagement strategies, with divestment from non-compliant companies as a potential option of last resort. Pension funds, crucial for sustainable futures, should align their financial planning with environmental responsibility.
4. ESG ratings are currently not a well-suited instrument of a company's environmental impact and should not be used as such. Investors looking to make their portfolios more sustainable should **adopt the EU Taxonomy instead, to better account for the environmental impacts of their investees**. In April 2024, EU policymakers reached an overall solid compromise and adopted the long-awaited ESG ratings regulation - the first ever attempt to regulate the ESG

³² NOW GmbH (2023). New NOW publication: Market development of climate-friendly technologies in heavy road freight transport. [Link](#).

ratings market at EU level. The deal reached will enhance the transparency of ESG ratings and is a milestone to ensure that they become true sustainability ratings.³³ The **EU will now need to ensure right implementation measures are enforced.**



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³³ See Transport & Environment's work on the topic. [Link](#).

Annex

I - Methodology to estimate Scope 3 emissions

Among the truck companies considered, only Scania and MAN (both belonging to the TRATON group) fully report their emissions in accordance with the GHG Protocol. Scope 3 emissions for the other companies were inferred from the information reported in their - or their parent companies' - 2022 sustainability reports. The next subchapters are dedicated to unveiling more details on each company.

Our own estimate of the scope 3 emissions of each truckmaker is based on annual sales, revenue and carbon output, as well as production data from AutomotiveWorld where sales were not disclosed. The estimate is made by multiplying the number of sales per company, their average emission factors, expressed in gCO₂/km,³⁴ and trucking activity in the EU. The average lifetime mileage is 1,135,000 km,³⁵ but we differentiated per manufacturer according to their 2021 sales. The resulting value represents the emissions category “3.11 - use of sold goods and products”, which is the main component of scope 3. To obtain scope 3 emissions, we need to measure the ratio of category 3.11 over total scope 3. We calculated a ratio of 0.96, an estimate made by combining information from Paccar (the parent company of DAF), MAN and Scania’s reports: Paccar is 94%, MAN 97%, and Scania 97%. Hence, category 3.11 divided by this factor would give the final scope 3 emissions. However, we decided not to apply this factor to the emissions calculated as before and assumed that total scope 3 equals scope 3.11. This led to a slight underestimation of the actual emissions but avoided attributing to some of the companies analysed more emissions than what they might be responsible for.

Unless otherwise specified, all the values refer to the year 2022. We also tested our methodology on Scania and MAN to validate it. Figure 2 in the main text shows the magnitude of scope 3 emissions per company. Unless otherwise specified, information in the text refers to the estimated emissions, rather than the reported ones.

Volvo and Renault Trucks

Volvo Trucks and Renault Trucks are part of the Volvo Group. In its 2022 Annual Report, the group reports aggregate scope 1, 2 and 3 emissions, without differentiating per company. However, they break down emissions per business unit, allowing us to split their disclosed emissions between each controlled company - with a focus on Volvo Trucks and Renault Trucks - using the share of revenues and sales.

³⁴ Emission values come from the European Environment Agency (EEA), reflecting what truckmakers communicate. We only considered diesel trucks, for two reasons: firstly, the EEA database is incomplete and reports many vehicles running on gas and biofuel as having zero emissions, which is not the case. Secondly, as they represent 97% of new sales in Europe, our approximation will closely mirror the reality. See footnote 36.

³⁵ Data refers to the European Union and United Kingdom. The value is an average of each truck category’s lifetime mileage, weighted by the number of vehicles in the stock. Source: European Commission, DG MOVE (2022). Study on New Mobility Patterns in European Cities.

Within Volvo Group, trucks account for 65% of the revenues. Within the trucks business unit, Renault is responsible for 25% of the sales, and Volvo Trucks for 62%.³⁶ Buses represent 4% of the group revenues. Volvo Bus, which accounts for 85% of the group's bus sales, was included in Volvo Trucks. Hence, assuming scope 1 and 2 emissions are distributed proportionally across all business units, it is sufficient to multiply them by the revenue share of each company. Scope 3 emissions are broken down by business unit (trucks, buses, construction equipment, and marine engines). For Renault, it is sufficient to multiply the emission of the Trucks unit by the share of truck sales (the above-cited 25%). For Volvo, we use the same reasoning but we must add buses.

Iveco

The Iveco Group comprises vans production and a few small extra-EU brands that need to be left out. Scope 1, 2 and 3.11 emissions are reported at the group level. Scope 3.11 emissions are reported at the group level both in absolute (million ton CO₂e) and relative terms (g CO₂e per vehicle-kilometre). However, the two values seem inconsistent. Iveco claims carbon intensity across the entire fleet (including vans) is 681 g CO₂/vkm, which is 18% lower than the value from the European Environmental Agency's official truck and bus measurements.³⁷ Even if we assumed this value is correct, then to match the value for overall scope 3 emissions they declare, we should assume an average lifetime mileage of 371,765 km per vehicle, which seems too low compared to the data. While it is true that vans have an average lifetime mileage of 322,000 km, the value for trucks is 1,135,000 km, more than three times as much. This means that by just considering Iveco's trucks - i.e. vehicles whose mass is above 3.5 tons - we obtain around 112,000 kt CO₂e against the 42,000 kt scope 3 emissions from the use of sold products declared by the company.

DAF

DAF is a private company held by the US group Paccar. The DAF brand's sustainability report is not very detailed and only displays scope 1 emissions. Aggregate scope 2 and 3 emissions are reported by Paccar at group level.

Mercedes-Benz Trucks

Mercedes-Benz Trucks is the European brand of the Daimler Group. Scope 1 and 2 emissions are reported without a detailed breakdown. Scope 3 emissions are not reported at all.

To translate the target of 60% ZEV sales in 2030 reported in Table 1, it is sufficient to multiply such value by the reference values for the share of category 3.11 in total scope 3, thus obtaining the interval reported in the text, footnote 9.

³⁶ The rest of sales comes from Mack Trucks, the American brand of the Volvo Group, which is out of this report's scope.

³⁷ European Environment Agency (2022). Monitoring of CO₂ emissions from heavy-duty vehicles - Regulation (EU) 2018/95. [Link](#).

Data per company

Below is a summary of the emission factors for each company, as retrieved from the EEA database (see footnote 31), together with sales - when disclosed by the company - or production, and mileage.

Company	Emission factor (g CO ₂ /km)	Sales/Production (units)	Mileage (km)
Mercedes-Benz	786.07	166,369	1,146,875
DAF	745.92	75,600	1,269,952
Volvo	840.56	151,010	1,216,460
Iveco	833.13	145,995	1,149,986
Scania	789.64	85,232	1,221,644
Renault	796.09	58,967	1,118,880
MAN	783.76	62,900	1,148,488

Table A1: summary of input data.

Carbon intensity for 100% ZEV truckmakers

Carbon intensity for truckmakers in case they only sell zero-emission vehicles is obtained as follows. Production is assumed to be constant at current levels by the time truckmakers reach the 100% ZEV target, as well as truck prices. This assumption fits with a time horizon of 25 years when both ICE-ZEV price parity and 100% ZEV sales can be achieved.

Scope 3.11 emissions are set to zero, as electric and fuel-cell trucks and buses emit zero tailpipe CO₂. The remaining scope 3 categories are kept to their 2022 level. The higher emissions coming from batteries are compensated by decarbonising the other company activities - like business travel, transportation and waste management/recycling.

II - Other

Diesel consumption from long-haul trucks

Long-haul trucks represent more than half of new truck registrations and run almost 90% of the freight activity in the EU. Table A2 reports the data used for calculating their lifetime fuel consumption and CO₂ emissions. The data are from the EUTRM, T&E's in-house simulation model for road transport.

Lifetime mileage	1,500,000 km
Fuel consumption	29.7 l/100km
Diesel carbon content	2,639 gCO ₂ /l
Lifetime diesel consumption	446,130 litres
Lifetime CO ₂ emissions	1,177 tonne

Table A2: lifetime diesel consumption and emissions for long-haul trucks.

Scope 3 weights in Bloomberg ESG score

We mentioned earlier that we estimate the weight of scope 3 emissions in Bloomberg’s ESG rating to be around 3%. Firstly, we know from the company itself that the E, S and G pillars have equal weight, hence the environmental pillar weighs one-third of the overall score. Inside the E we find the GHG emissions management section, whose weight for the trucking sector is 25.18% as reported by Bloomberg. The GHG management section is composed of four categories: ‘Direct emissions’, ‘Scope 3 emissions’, ‘Reduction targets’ and ‘Policies’. The weights of these categories are not disclosed, but their scores are. So it is sufficient to look at the scores for the different companies and solve the linear system to infer the weights.

OEM	Emissions	Scope 3	Targets	Policies	Total GHG management
Daimler	6.86	0.00	0.00	10.00	1.64
Volvo	8.00	10.00	10.00	10.00	9.55
Iveco	8.86	0.00	3.08	10.00	3.65
Traton	8.41	0.00	10.00	10.00	5.83
Paccar	7.93	10.00	6.92	10.00	7.92

Table A3: GHG Management score breakdown. Values as of October 15th 2023.

The resulting weight for scope 3 emissions is in the [0.32 - 0.38] range, hence we used the average of 0.35. Then, we combined it with the previous weights to obtain the weight in the overall ESG score.