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Credible climate transition plans: Insights from an AI-driven analysis of corporate disclosures

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Summary

- Globally, across various sectors, **only 40% of companies disclose their decarbonization measures** and simultaneously quantify their contribution to achieving emission targets. Both are important criteria for assessing credible transition plans. Companies in Europe and Japan quantify their measures significantly more often than companies elsewhere.
- The controversial use of carbon credits and negative emission technologies to achieve emission targets does not seem to be widespread practice among many high-emitting companies.
- We observed significant differences between sectors, which could be of interest to investors in their own assessment of credible climate transition plans.
- Clarity AI has used a Large Language Model (LLM) to examine the credibility of climate transition plans for several hundred high-impact companies regarding their reported decarbonization measures, as well as their use of carbon credits and Carbon Capture and Storage (CCS) to achieve emission targets.

Current challenges in the assessment of climate transition plans

Investors are increasingly focused on analyzing corporate climate transition plans due to their expected impact on long-term financial performance and sustainability. As the world grapples with climate change, companies' strategies for managing carbon emissions, adapting to regulatory changes, and transitioning to a low-carbon economy are becoming crucial indicators of resilience and competitiveness.

However, ESG teams tasked with evaluating the credibility of these plans may face many challenges. They include inconsistencies in the data format, terminology, and metrics used by companies in their climate disclosures or variations in data quality and completeness across reports. Additionally, some companies may provide selective data, or exaggerate their climate commitments. In this regard, evaluating climate transition plans can be particularly challenging as it typically involves assessing a wide range of aspects related to corporate climate action, such as a company's net zero vision, the ambition of its emissions reduction targets, decarbonization measures, and not to forget the financing of the transformation, (see Figure 1).

In view of this particular challenge, the use of Large Language Models (LLMs) can effectively support the research process. LLMs can efficiently extract relevant information from vast amounts of unstructured data contained in corporate reports, thereby automating the data collection process.

The models also offer powerful capabilities for understanding and interpreting complex language patterns, allowing them to identify key aspects of climate transition plans across multiple reports. In this study, we present key findings from our AI-driven evaluation of companies' implementation strategies, focusing particularly on their decarbonization measures.

As part of this research, **we also examined two controversial approaches to corporate emissions management, namely the use of carbon credits and negative emissions technologies.**

Figure 1: Typical elements of a credible climate transition plan



Corporate decarbonization measures and the need for quantification

In general, companies have a range of measures at their disposal to decarbonize their operations and value chain. These include purchasing or producing renewable energy, increasing energy efficiency, using new technologies for lower-carbon processes and products, switching to new business areas, or influencing suppliers and customers.

To assess the credibility of these measures as part of a climate transition plan, we leveraged the [CA100+ Net Zero Company Benchmark 2.0](#) for our analysis. This assessment framework demands that for companies to make credible statements about their actions, they must disclose relevant measures and also quantify the contribution of these measures to achieving emission reduction targets.¹ This seems reasonable, as the quantification of measures increases transparency and accountability towards stakeholders by providing better insights into the sources and drivers of emissions reductions.

Based on these two specific assessments criteria, we trained an LLM and applied it to analyze a sample of high-emitting companies. To select the sample, **we focused on large-cap companies with an emission reduction target for which a current Corporate Social Responsibility (CSR) report was available**, taking into account regional and sectoral diversification.² Overall, our sample included 319 companies.

The task for the model was to identify the number of companies that **reported and quantified** their decarbonization measures, aiming to gauge the prevalence of this disclosure practice among high-impact companies.³ We did not explicitly differentiate between the various emission scopes, but it was observed that the measures primarily related to Scope 1 and 2 emissions, for which targets were more frequently formulated than for Scope 3.

Our model suggests that whilst over 80% of companies in our sample reported on decarbonization measures, only less than 40% of all companies also made a clear quantification of their measures. The level of quantification was higher **among Japanese (67%) and European (48%) firms**, together comprising about one third of the sample.

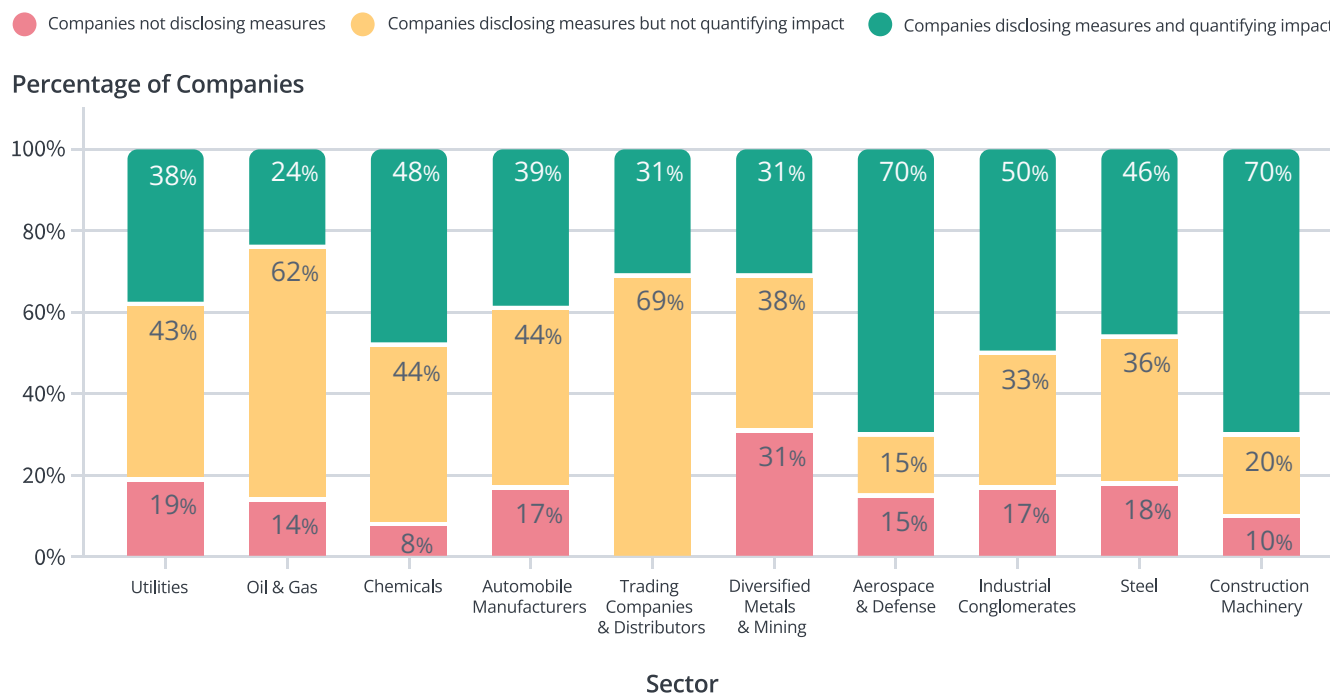
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1. A similar, albeit weaker, requirement for determining the contribution of measures to target achievement can also be found in the [Transition Plan Taskforce Disclosure Framework](#).

2. We considered CDP reported targets, Science-based targets, net zero commitments or other quantified GHG emissions targets. The sample comprised companies from North America (36%), Europe (27%), Asia ex Japan (21%), Japan (8%), and others (8%).

3. For quality assurance, manual validations of the results were conducted.

Figure 2: Share of companies disclosing decarbonisation measures and their impact by sector (top 10 sectors, n = 230)



However, the average rates of quantification per sector were mostly low, especially in the sectors that made up a large portion of the sample, including utilities and oil & gas (see Figure 2).⁴

These low compliance values resulted even though our model was given relative freedom in the interpretation of quantification. For example, quantifying impact could include reporting on past contributions of individual measures as well as reporting quantified sub-targets, such as on future renewable energy procurement or increasing recycling rates.

However, the model found many instances where no quantification towards target achievement was made and subsequently dismissed the disclosure as non-compliant with the assessment criterion (see Figure 3).

It should be noted that in positive cases, we did not perform a qualitative assessment of the information collected by the LLM. This means that quantifications were acknowledged even if the measures possibly referred to non-material emissions. Therefore, the share of positive cases could be even lower after such a qualitative analysis.

Figure 3: AI-generated assessment of the quantification of decarbonization measures by a South Korean chemical company in its CSR report

The company's report outlines several initiatives aimed at reducing Greenhouse Gas (GHG) emissions, such as the transition to renewable energy, development of plastic recycling technologies, and the introduction of an Internal Carbon Pricing (ICP) system to accelerate the transition to a low-carbon business model. However, the report does not provide specific quantifiable contributions of these decarbonization actions towards achieving its GHG emissions reduction targets. While the commitment to securing 260 GWh of renewable energy and offsetting emissions through cookstove distribution projects are mentioned, the direct impact of these actions on the company's overall GHG emissions reduction targets is not quantified.

4. Sample sizes per sector: Utilities: 54, Oil & Gas: 50, Chemicals: 36, Automobile Manufacturers: 18, Trading Companies & Distributors: 13, Diversified Metals & Mining: 13, Aerospace & Defense: 13, Industrial Conglomerates: 12 Steel: 11, Construction Machinery: 10.

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In conclusion, our model suggests that globally, the majority of companies, regardless of sector, have not yet fully met the examined criteria for credible transition plans. Better results were achieved by companies from Europe and Japan, which may be related to the wider adoption of Science-based targets (SBTs) and more developed disclosure regulations in these markets.

However, outside of these regions, our findings have revealed some gaps persistent in corporate disclosures, and the need for more companies to move away from 'cheap talk' to disclosing quantifiable achievements and actions in order to satisfy their shareholders' growing demands for credible transition plans.

On the use of carbon credits and negative emissions technologies

Another aspect of our analysis related more generally to the intention of companies to use carbon credits and negative emissions technologies (e.g., Carbon Capture and Storage, or CCS) to achieve their emission reduction targets. Although these approaches can make a contribution to climate protection, their use by companies for target achievement is often criticized.

For example, many critics argue that **the quality and effectiveness of carbon credits are often low, and that companies may use them to divert attention from their own carbon emissions and inadequate efforts to reduce them.** This [criticism](#) recently became louder when the leadership of the Science Based Targets initiative (SBTi), the arbiter of corporate emissions targets, publicly considered allowing carbon credits as an instrument for achieving targets, despite having previously rejected this idea.

Our model found that only about 22% of all companies in our sample reported using carbon credits to achieve their targets. This suggests that offsetting is not a common measure among high-emitting companies for target achievement.

Furthermore, our model did not distinguish whether companies intend to use carbon credits as a primary tool for achieving their targets or merely to offset unavoidable residual emissions.

The latter can be justifiable under certain conditions, and it is assumed that some companies follow this approach. Therefore, the proportion of companies in the study that pursue carbon offsetting as a core measure could be even lower. Still, **at over 32%, the share was higher among Asian companies, particularly Japanese firms.**

Furthermore, companies in certain sectors, including aerospace & defense and oil & gas, were found to be among the heavier users of carbon credits compared to other sectors (see figure 2). This indicates that investors concerned with the use of carbon credits as part of companies' climate transition plans may want to pay particular attention to firms in these regions and sectors. The potential for specific risks to arise was highlighted by a recent [EU investigation](#) into greenwashing practices among European aviation companies, which are being asked to clarify the extent to which their claims about emission reduction through offsetting can be supported by scientific evidence.

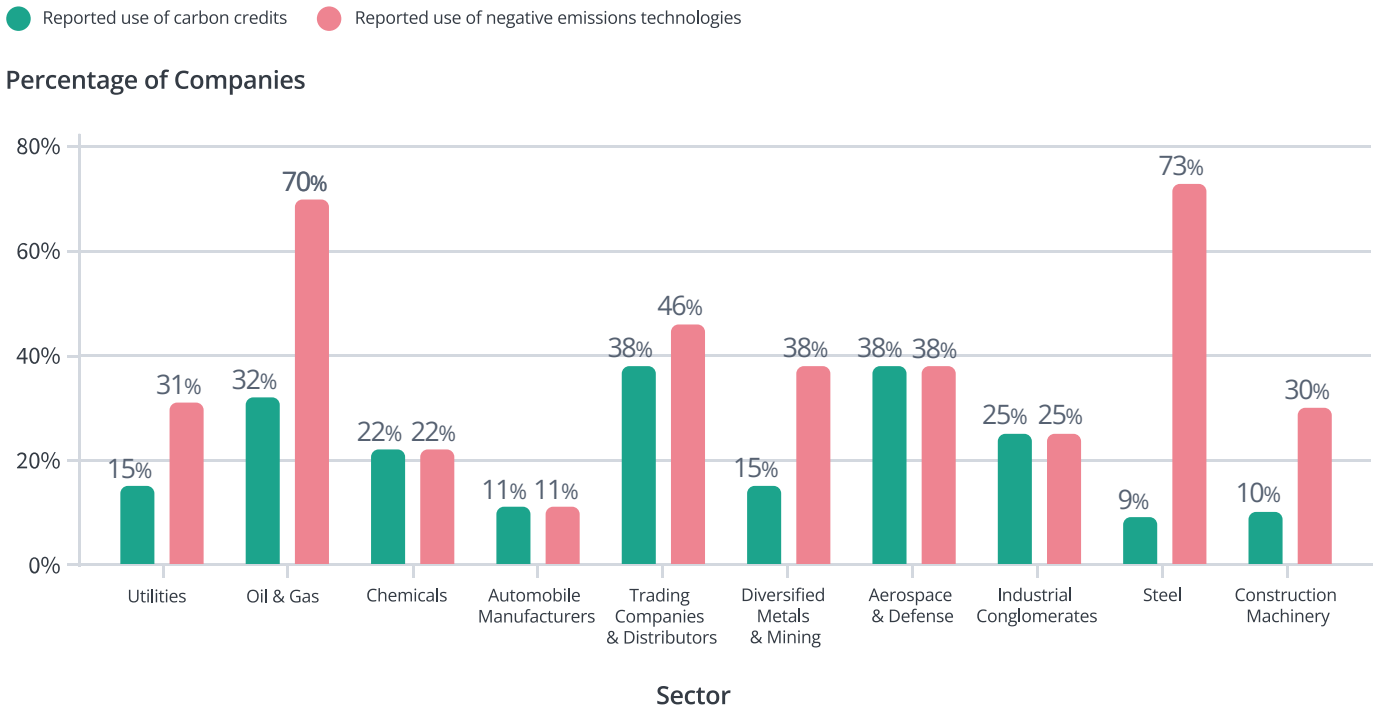
Similar to carbon credits, **controversies also exist around the use of negative emissions technologies such as Carbon Capture and Storage (CCS)** or reforestation which are still in the early stages of development or have not yet been proven at scale. Therefore, critics often fear that companies overstate the role of these technologies in their climate transition plans to create a positive image without making substantial changes to their emissions-intensive operations.

Our model found, that across our sample, 38% of companies reported on the use of these technologies for target achievement. While not the majority, it suggests that more than one in three companies are planning to employ these technologies and approaches.

For example, **the share was much higher in the oil & gas and steel sectors, with over 70%** (see figure 4). The reasons for this can vary. It can be reasonably assumed that the willingness for genuine decarbonization is relatively low in the oil & gas sector, and that CCS is used to legitimize the existing business model. In other sectors, breakthrough technologies (such as green hydrogen or electric arc furnace steelmaking) are in early stages of development or too expensive in the foreseeable future, which is why CCS may be seen as an important and perhaps justified alternative for emission avoidance.

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Figure 4: Reported use of carbon credits and negative emissions technologies for target achievement by sector (top 10, n= 230)



In summary, while carbon offsetting and negative emissions technologies can play an important role in mitigating global warming, they are not without their challenges and controversies. Critics often argue that they should be seen as a complement to, rather than a substitute for, genuine efforts to reduce emissions at the source through emission reduction measures and sustainable practices.

Accordingly, an overly strong reliance on these approaches by companies could affect the credibility of their climate transition plans. Our quantitative analysis showed that whilst they are not very common measures for target achievement among global high impact companies, the associated risk of greenwashing may be higher for companies in certain regions and sectors.

How Clarity AI can help you

At [Clarity AI](#), we leverage our advanced technology to deliver the only solution in the market that tracks Net Zero progress in a **simple, comprehensive manner** based on the five criteria of the IGCC’s Net Zero Investment Framework (NZIF). We help market participants integrate temperature alignment metrics into portfolio analysis to understand the true ambition behind companies’ emissions targets. **To ensure the relevance and timeliness of our insights, we automatically process companies’ transition plans through the use of LLMs that help us analyze and synthesize the information in a scalable manner.**

Learn more about our solutions

[Contact us](#) to learn more about Clarity AI’s multidimensional approach to Net Zero.

About Clarity AI

Clarity AI is the leading sustainability tech company, leveraging advanced technology and AI to provide data-driven environmental and social insights to investors, corporates, governments, and consumers. AI has been at the core of Clarity AI's offering from the start, supporting a fully flexible set of data solutions, insights, analytics capabilities, and tools used for portfolio management, corporate research and engagement, benchmarking, regulatory reporting, online banking, and e-commerce.

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