



# THE MISSING GHG EMISSIONS

How Satellite Data Can Quantify the Real Climate Risk of Oil & Gas Companies



# The Missing GHG Emissions: How Satellite Data Can Quantify the Real Climate Risk of Oil & Gas Companies

**W**hile a growing number of companies disclose sustainability-related information, there are still challenges around data completeness, consistency, and transparency. For example, all publicly traded Oil & Gas companies listed in the MSCI All Country World Index (ACWI) report their greenhouse gas (GHG) emissions. Still, over 90% of these companies do not incorporate the Scope 3 emissions from their investments in their reports.

The lack of information on Scope 3 emissions can lead to large perceived differences across companies that don't necessarily reflect the reality and to underreporting of portfolio carbon footprints. The analysis of independent physical asset-level inventories of emissions, such as those compiled by Climate TRACE, alongside the company-level data compiled by Clarity AI can play a crucial role in bridging the reporting gap to enhance investors' decision-making.

Leveraging our collaboration with [Climate TRACE](#), we have analyzed the largest 20 companies in the Oil & Gas industry<sup>1</sup>, quantifying GHG emissions from all physical assets that these companies own, including their minority investments. Our research found that the relative ranking of these companies in terms of carbon intensity is significantly affected by the inclusion or exclusion of the assets they own but don't operate - one of the companies dropped six positions, from being the ninth lowest emitter to the fifteenth.

We have quantified the impact of these "missing emissions" in the carbon footprint of a theoretical portfolio that invests in the largest 20 Oil & Gas companies<sup>2</sup> - the carbon footprint grows by 24% when including the emissions from assets that these companies own but don't operate.

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## Asset-level data can create a new level of transparency in GHG emissions data

Climate TRACE is a coalition of organizations working together to independently track GHG emissions globally<sup>3</sup>. In December 2023, Climate TRACE released an asset-level inventory, covering 350 million+ facilities and locations, representing the biggest known sources of greenhouse gas emissions across all major sectors. The GHG emissions estimates at the asset level leverage artificial intelligence to process satellite and sensor data to assess activity levels (e.g., by analyzing physical variables such as steam plumes and heat), [combined with emission factors and capacity data](#). Clarity AI integrates Climate TRACE physical asset data and emission estimates into risk analyses to support investors in their decision-making.

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1. Companies selected based on market capitalization

2. With portfolio weights proportional to each company's market cap

3. The original founders of the Climate Trace coalition includes: AI Gore, Carbon Yield, CTrees, Duke University, Earth Genome, Global Energy Monitor, Hypervine, Johns Hopkins APL, OceanMind, RMI, TransitionZero, and WattTime

## What are oil & gas companies reporting?

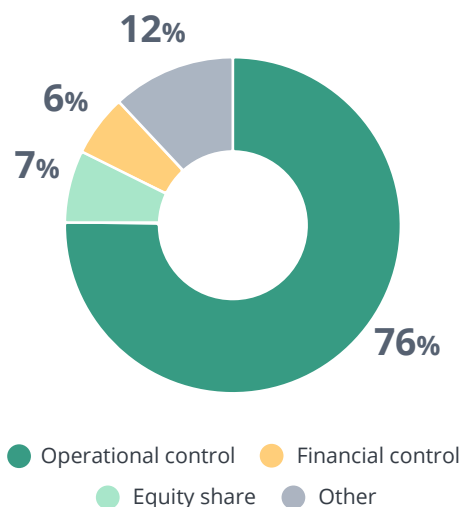
To reflect various corporate structures, the [GHG Protocol](#) (a standardized framework used to measure and manage GHG emissions) proposes three approaches for defining the reporting boundaries of companies - i.e., what is included in the companies' direct emissions:

- **Equity share approach:** Companies account for GHG emissions from operations and assets based on their share of equity (e.g., if the company has the rights to 30% of the risks and rewards of an asset it accounts for 30% of the emissions of the asset).
- **Financial control approach:** Companies account for GHG emissions from operations over which they have financial control - where financial control is defined in a way consistent with international accounting standards.
- **Operational control approach:** Companies account for GHG emissions from operations over which they have operating control. Under this approach, Oil & Gas companies should include those emissions related to joint ventures if the company can determine management and board-level decisions.

The main difference between these approaches is whether GHG emissions from operations in which the company owns an interest but has no control (financial or operational) should be reported as Scope 1 or Scope 3. This is particularly relevant for Oil & Gas companies given that around 70% of them have participation in at least one asset where they don't have operating control.

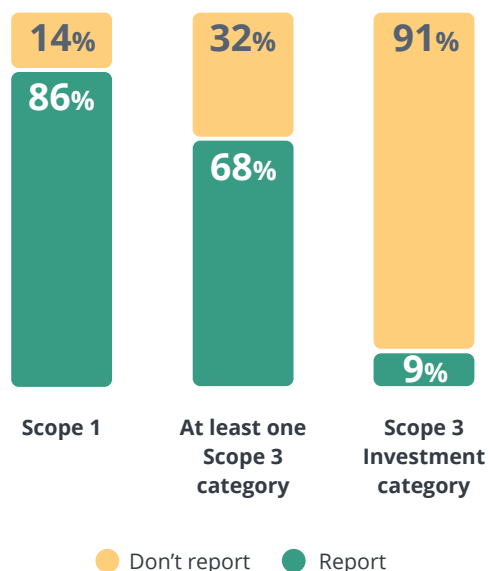
As can be seen in Figure 1, over 80% of Oil & Gas companies report using either the Financial or Operational control approach, which means they should report the emissions from assets they don't control under the Scope 3 category of investments. However, as can be seen in Figure 2, while 30% of these companies report at least one Scope 3 category, only 9% report the emissions from their investments. Out of the top 20 Oil & Gas companies, only one currently reports emissions from assets the company owns an interest in but has no control over (financial or operational).

**Figure 1:** Distribution of companies by reporting boundary approach, based on 2023 CDP questionnaire data



NOTE: Data shown for 104 Oil & Gas companies that answer the question and report Scope 1. Source: Clarity AI analysis based on 2023 CDP questionnaire. Data: April 2024

**Figure 2:** Share of Oil & Gas companies reporting Scope 3, based on 2023 CDP questionnaire data



NOTE: Data shown for 130 Oil & Gas companies. Source: Clarity AI analysis based on 2023 CDP questionnaire. Data: April 2024

Emissions that go unreported can generate two issues for investors:

- **Perceived carbon intensity performance of companies:** Some companies might appear to have a better performance than others simply because they operate a lower share of the assets they invest in.
- **Aggregate emissions of portfolios:** The carbon footprint of investor portfolios might be higher than what they appear because they don't consider the emissions from assets companies don't have control over.

### Filling the reporting gap with asset-level inventories

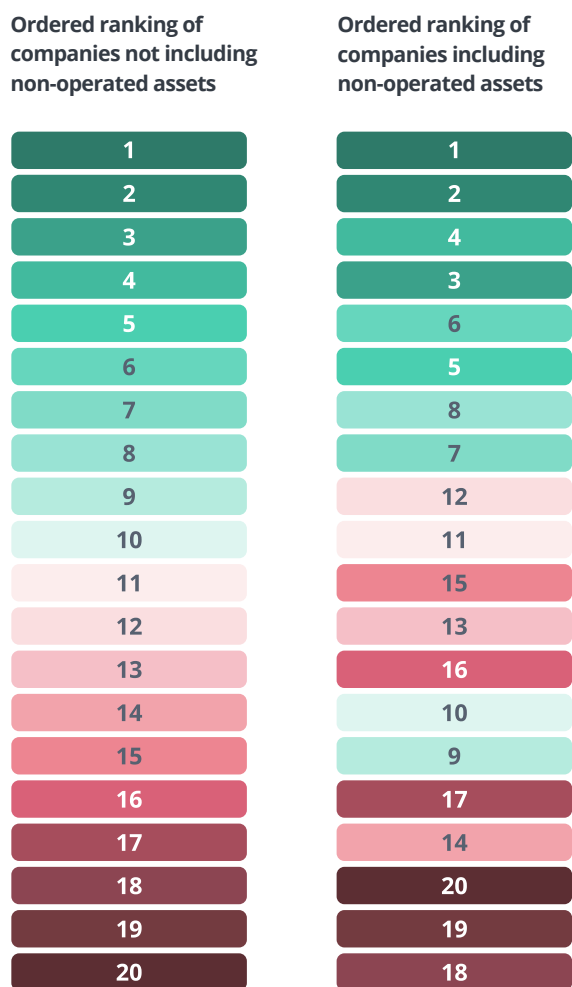
Through our collaboration with Climate TRACE, we are able to help investors better understand the size of this gap and how it impacts the perceived performance of companies and the aggregate emissions of portfolios. Clarity AI combined Climate TRACE's estimates of GHG emissions - based on satellite and sensor data - from the assets where the 20 largest Oil & Gas companies have invested in<sup>4</sup>, with data on the asset ownership structure and the asset operator<sup>5</sup>.

With this information at the asset level, we were able to calculate the emissions from each company - both the ones that were part of the companies' Scope 1 - because they controlled the assets - and the ones that weren't (i.e., the emissions that should have been reported under the Scope 3 category of investments).

**Figure 3** shows how the perceived performance of companies is affected by not including the emissions from the assets that companies invest in, but which they don't operate.

First, we ranked companies based on the emissions of the assets they operate (left column). Then, we ranked them after adding the corresponding emissions of their other investments (right column). For example, the company that ranked fourth when only considering the assets it operates moved to the third position when investments in non-operated assets were considered. In both cases the emissions were divided by the enterprise value of the company, to remove the effect of company size.

**Figure 3:** Changes in company ranking when ordering companies based on intensity of GHG emissions from assets they operate and when including investments in assets they do not operate. On the left column, 1 represents the best performing company, and 20 the worst performing company. Original colors are kept on the right column to illustrate the difference in ranking.



Overall, 17 out of the 20 companies changed their relative position on the ranking, with an average change of approximately two positions per company. The company that experienced the largest change dropped six positions, from ninth to fifteenth.

4. Estimates were available for 450 assets where these companies have invested

5. We researched the ownership structure and identified which company had control over the asset for the largest 100 assets, that represented 79% of the emissions. For the remaining 350 assets, which were significantly smaller and only accounted for 21% of the emissions, we assumed that the company with the largest share of ownership was also the company operating the asset

Figure 4 shows the impact of the investments in non-operated assets in the calculation of portfolio footprints. To measure this impact Clarity AI calculated the footprint of a theoretical portfolio that invests in these companies<sup>6</sup> when considering only the emissions from assets they control and when considering the emissions from non-operated investments<sup>7</sup>. **The carbon footprint of this portfolio is 24% higher when including the emissions of the assets that the companies don't operate.**

Figure 4: Changes in portfolio carbon footprint by including emissions from non-controlling investments

Without non-controlling investments

100%



With non-controlling investments

124%



## Conclusion

Current reporting practices can lead to discrepancies in reported GHG emissions that don't necessarily reflect the reality of environmental performance.

Given the increased use of climate data for investment decisions, investors might direct capital flows away from companies that arguably have better environmental performance but whose reporting boundary puts them at a disadvantage.

Furthermore, they might be exposed to climate risks they are not even aware of and incur the risk of underreporting their financed emissions by not having access to the emissions of the investments from their portfolio companies. These hidden risks highlight the importance of data that is not reported by companies, such as the granular emissions estimates provided by Climate TRACE's dataset and Clarity AI's estimation models. ●

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# Advanced technology helps investors uncover risks for better portfolio management

## Acknowledgments



6. Weights in the portfolio were defined to be proportional to each company's market cap

7. Emissions not directly related to assets - i.e., the other categories of Scope 3 - were not included in the calculation of the portfolio footprint

## 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.

Within the investment sector, Clarity AI serves a direct network of clients managing over \$50 trillion in assets and includes firms like Invesco, Nordea, Lazard Asset Management, and Santander. Our strategic partnerships with financial institutions such as BlackRock, the London Stock Exchange Group (LSEG), BNP Paribas, Caceis, or SimCorp, allow thousands of users to access Clarity AI advanced data analytics capabilities through their usual investment platforms, ensuring a seamless workflow experience. Additionally, our partnerships with platforms like Diligent, boasting one million users, or Klarna, currently reaching over 150 million online buyers, benefit corporates and consumers alike. Clarity AI has offices in North America, Europe, and the Middle East.

For more information visit [www.clarity.ai](http://www.clarity.ai)

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