

# What corporations aren't disclosing about their carbon dioxide emissions

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A new study estimates most corporations are not reporting the full scope of their carbon footprint with many claiming to be "green" despite a lack of reporting on Scope 3 key categories. The paper is [published](#) in the journal *PLOS Climate*.

Though CO<sub>2</sub> reporting is currently voluntary for most firms, corporations are under pressure from investors, regulators, politicians, non-profit organizations and other stakeholders to disclose and reduce [greenhouse gas emissions](#) (GHG).

The standard for greenhouse gas accounting, the Greenhouse Gas Protocol, is used worldwide to measure a company's total carbon footprint with three levels of reporting.

1. The first measures the GHG emissions directly produced by a company during business activities (such as emissions from a corporate fleet).
2. The second measures emissions associated with the production of energy that is purchased from an external supplier (such as emissions produced by electricity providers).
3. The third (Scope 3) measures indirect emissions not already accounted for and includes upstream and downstream emissions from a company's full value chain, such as emissions produced by customers as a result of a company's product (downstream) and emissions produced in the manufacture of a company's equipment (upstream).

Griffith Department of Accounting, Finance and Economics Professor Ivan Diaz-Rainey, a leading international expert in climate and sustainable finance said firms were being strategic in their Scope 3 reporting and this could underpin greenwashing.

"Scope 3 emissions account for the highest proportion of total emissions, and it's the least likely scope to be reported on," Professor Diaz-Rainey said.

"Companies have a great incentive to better their scope one and two emissions because direct energy efficiency leads to financial savings. An

oil and gas firm may pump oil out of the ground, and in doing so, may use vehicles and electricity, but what really counts in terms of the impact of an oil and gas firm, is how the end users are emitting GHG as a result of purchasing the firm's product.

"For the oil and gas firm, the Scope 3 emissions are emitted by people who purchase the oil and use it in their cars to drive around or take a flight. If an oil and gas firm only report on Scope One and Two, we are missing most of the story. If a bank gives a huge loan to a coal or a gas project, their Scope 3 emissions would be very high. Some jurisdictions are moving towards mandatory disclosures, driven by the Task Force on Climate-Related Financial Disclosures (TCFD), and pressure to make Scope 3 mandatory is increasing."

The research is an industry-university collaboration between climate risk analysis firm EMMI and researchers at Griffith University and the University of Otago.

UNSW Climate Change Research Centre adjunct fellow and co-founder of EMMI Dr. Ben McNeil said Scope 3 emissions for companies were difficult to quantify, but critical in understanding how companies were financially exposed to carbon pricing and their decarbonization pathways.

"Although significant uncertainty remains, our novel [machine learning](#) approach to estimating Scope 3 emissions has proven valuable to understand whether a company has 'material' financial exposure to a net-zero world where carbon is legislated and priced," Dr. McNeil said.

Lead researcher University of Otago Research Fellow Dr. Quyen Nguyen said researchers used machine learning to improve the prediction of corporate carbon footprints, which provided an indication of where policymakers and regulators should concentrate their efforts

for greater disclosure.

"We discovered firms chose to report on certain categories within Scope 3 and they often chose to report on categories which are easier to calculate instead of categories which really matter like Use of sold products," Dr. Nguyen said. "Firms generally report incomplete compositions of Scope 3 emissions, yet they are reporting more categories over time.

"It is interesting to see the Scope 3 categories firms choose to report on are not always the most material, such as travel emissions and this may be because it is difficult to collect data for other relevant and material categories (such as the use of products and processing of sold products), but it could also mean that the true environmental impact of a firm is being disguised.

"Machine learning can help predict individual Scope 3 categories, but it is no magic bullet, what we need is for firms to report more Scope 3 categories. Firms are reporting more categories over time, and the fraction of firms which [report](#) scope 3 emissions are around 60 percent of [firms](#) which are already reporting Scope One and Two emissions."

**More information:** Quyen Nguyen et al, Scope 3 emissions: Data quality and machine learning prediction accuracy, *PLOS Climate* (2023). [DOI: 10.1371/journal.pclm.0000208](https://doi.org/10.1371/journal.pclm.0000208)

Provided by Griffith University

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