Systematic Underreporting in Corporate Scope 3 Disclosure

Topic: Enterprise Input-output Analysis
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Accurately assessing corporate carbon footprints is essential, and this is especially true for the Scope 3 emissions which encompass indirect emissions within a company's value chain. These emissions are crucial for a comprehensive view of corporate climate responsibility. Thus, a precise and transparent quantification method is vital for robust corporate carbon reporting and effective climate mitigation. Existing studies, often reliant on Multi-Regional Input-Output (MRIO) databases, primarily estimate carbon emissions at national and sector levels, lacking granular detail. Here, we quantify Scope 3 emissions of companies using an enterprise-level multi-regional input-output (EMRIO) table with the company reporting direct (Scope 1 and 2) emissions of companies. Using a systematic top-down approach considers corporations as portions of the complete global economy and avoids the issue of incomparable Scope 3 emissions, which can arise when different companies use different inventory data and models as is often the case in conventional bottom-up life-cycle estimates and prior MRIO-based estimates. This study provides two main results: A new assessment and comparison to CDP Scope 3 for 500 companies, and new Scope 3 results for 1,500 companies. We find that, collectively, company self-reported Scope 3 emissions may be underestimated by nearly 50%, or 0.75 Gt C, compared to our estimate using a harmonized approach.