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UNIVERSITÄT ZU KÖLN

POLICY BRIEF 1/3

WHICH CARBON EMISSIONS SHOULD BE MONETIZED?

KEY TAKEAWAYS

- *Monetizing emissions requires deciding whether to incorporate direct as well as indirect emissions arising in the value chain and outside a firm's direct control.*
- *While including indirect emissions offers a comprehensive assessment of carbon footprints, it comes with measurement challenges and deficiencies in data quality.*
- *Empirical evidence shows that stakeholders prefer integration of direct and indirect emissions. However, upstream emissions are considered more relevant than downstream emissions due to concerns about measurability and accountability.*

WHAT IS THE JUST-PROFIT PROJECT?

The objective of the "Just Profit" research project is to assess policy options on how to integrate the costs of greenhouse gas emissions into existing financial accounting and disclosure rules. Current approaches to align financial resources with the Paris-objective of limiting global warming to 1.5°C focus on charging some polluters for their emissions (carbon pricing) and/or promoting transparency about corporate carbon footprints (carbon disclosure). Our project evaluates monetization approaches that combine carbon disclosure and pricing elements. Such approaches translate corporate "carbon footprints" into "monetary footprints" and can be used to merge financial and sustainability reporting by calculating CO_2-adjusted[1] key financial performance indicators (e.g., a CO_2-adjusted EBIT). As illustrated, such an adjustment has two main components: the scope of the emissions and the price per tonne of emission.

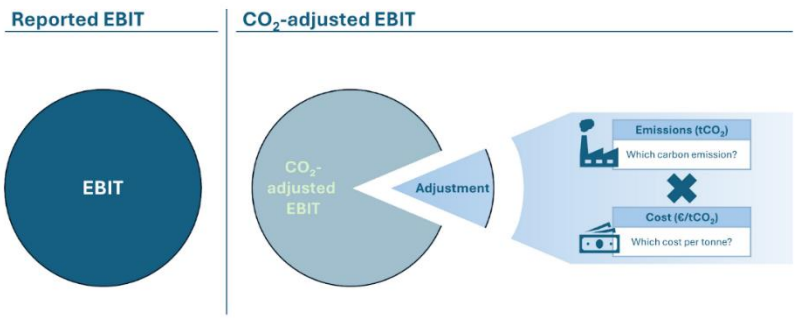

Figure 1 - Basic Adjustment Framework for a CO_2-adjusted EBIT

[1] For simplicity, the name of the KPI is referring to CO_2 emissions only. However, from a conceptual perspective, it is intended to include all types of GHG emissions, not only CO_2 emissions.

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THE CHALLENGE OF MEASURING CARBON EMISSIONS

The Greenhouse Gas Protocol (GHG Protocol) distinguishes between direct and indirect emissions. Direct emissions ("Scope 1") constitute emissions arising directly from sources that are owned or controlled by a firm. Accordingly, they are caused directly by production processes at firms' sites (GHG Protocol 2004). Indirect emissions are a consequence of the firm's activities but arise outside the operational boundaries of the firm. They include Scope 2, Scope 3 Upstream and Scope 3 Downstream GHG emissions, as shown in Figure 2. The Corporate Sustainability Reporting Directive (CSRD) with its corresponding European Sustainability Reporting Standards (ESRS) requires the disclosure of information about the three scopes (DR E1-6), if a company considers them as material and individual emission categories as significant. In the following, we comment on the strengths and weaknesses of using direct and/or indirect emissions in the context of monetizing emissions.

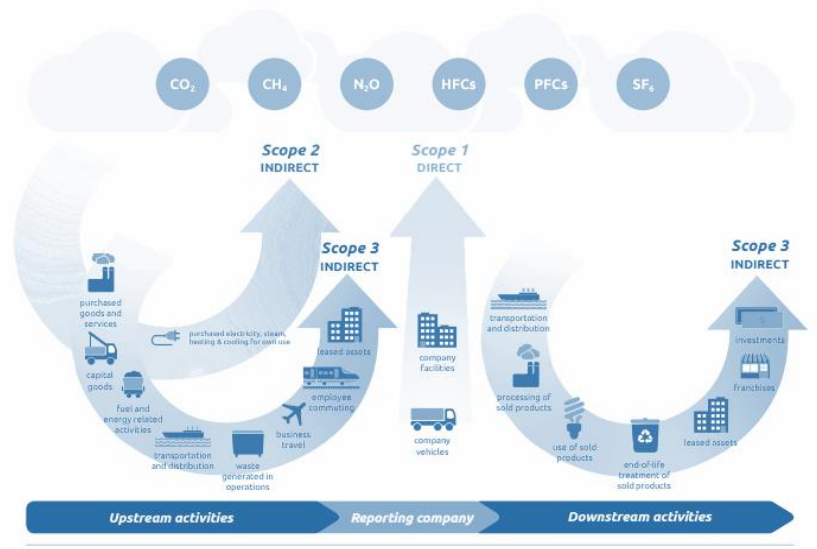

Figure 2 - Emission Scopes (GHG Protocol 2011)

DIRECT EMISSIONS

For the purpose of adjusting key financial indicators, using direct emissions is opportune since these emissions are within a firm's control (Leuz 2022; Glenk 2023). Controllability is favorable from a measurement perspective, as firms can more easily and credibly gather activity data pertinent to measuring direct emissions. Specifically, companies can determine the emissions based on physical quantities (Easton et al. 2024) and measure them directly at the activity level (Leuz 2022), ensuring high data quality. Direct emissions further reflect impacts directly attributable to companies as polluters (e.g., Greenstone et al. 2023 use direct emissions monetized at their social cost to measure "corporate carbon damages").

An exclusive focus on direct emissions, however, has potential shortcomings. From a comprehensive impact perspective, direct emissions limit insights into the carbon-intensity of the firm's value chain. In addition, firms might strategically outsource their emissions to reduce those emissions that fall under Scope 1 emissions (Leuz 2022; Känzig et al. 2024). Therefore,

direct (Scope 1) emissions can be seen as a baseline for emissions to be taken into account in potential monetization approaches.

INDIRECT EMISSIONS

When focusing on indirect emissions, the key benefit is that firms are incentivized to look beyond their own operations and recognize the environmental impacts of their sourcing and sales decisions. Considering a comprehensive organizational footprint raises awareness that demand- and supply-side decisions influence broader environmental outcomes. If firms develop an understanding of Scope 2 emissions, they can make informed decisions about energy sourcing, efficiency improvements, and potential investments in renewable energy (Persefoni 2024). On average, Scope 3 emissions account for over 80% of firms' total GHG emissions, and therefore a sizable part of firms' carbon footprints (FTSE Russell 2024; TCFD 2021). Indirect emissions are also becoming increasingly relevant from a stakeholder perspective. For example, while price and product quality constitute the main factors in purchase decisions, customers are willing to pay more for green production across the value chain (BCG Germany 2023; Leonelli et al. 2024).

While including indirect emissions facilitates a more comprehensive footprint assessment, there are potential shortcomings regarding their measurement and controllability. Of particular concern are measurement uncertainties and the occurrence of double counting across firms (Kaplan & Ramanna 2021). The main measurement issues revolve around Scope 3 emissions, especially for Downstream emissions. While Scope 3 Upstream emissions are based on past transactions, which in principle disciplines their estimation, a large share of Scope 3 Downstream emissions relate to emissions that have not yet occurred (Glenk 2023). This requires firms to estimate emissions relating to the future use and disposal of products sold today (Gowdy 2022). Consistent with this notion, firms' disclosure practices tend to focus on Scope 3 Upstream as opposed to Downstream emissions, potentially because of the discretion involved in gauging the significance of Scope 3 emission categories and difficulties in appropriately measuring Downstream emissions. Overall, as Scope 3 disclosures are prone to high variability across years and companies, stakeholders face problems in terms of using and comparing the data (FTSE Russell 2024).

SURVEY EVIDENCE

To assess relevance from the perspective of stakeholders, we conducted a survey among investors and other stakeholders (N=567) with 69% of participants being investors. While there is a clear preference for a consideration of both direct and indirect emissions in the context of monetization for the purpose of adjusting key financial indicators (70% of respondents), stakeholders do not view all indirect emissions as equally relevant, as shown in Figure 3. Specifically, among those 70% respondents favoring the use of both direct and indirect emissions, we find a stronger preference for Upstream indirect (Scope 2 and Scope 3 Upstream) as opposed to Downstream indirect emissions (Scope 3 Downstream).

Regarding this asymmetric preference for Up- as opposed to Downstream emissions, our survey evidence reveals that respondents question the measurement quality of Downstream emissions,

the accountability of the firm for Downstream emissions (e.g., "people are not really demanding accountability for downstream emissions in the value chain") and its ability to control them (e.g., "we [...] mainly focus on what [...] we can control directly").

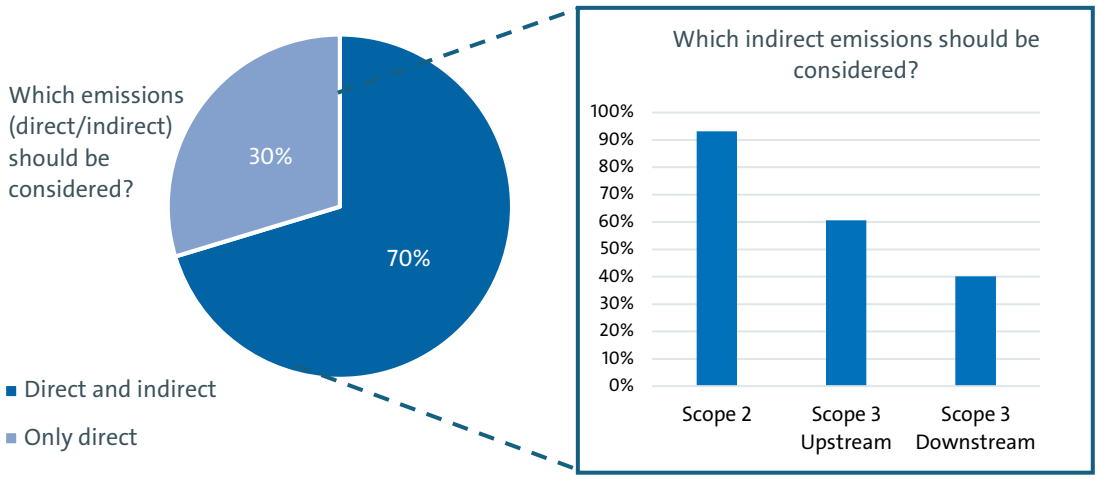

Figure 3 - Survey evidence

Another interesting pattern arises when sorting the respondents into whether they view the objective of a CO_2-adjusted key financial performance indicator as providing information regarding a firm's transition risk (i.e., a financial materiality perspective) or environmental impact (i.e., impact materiality perspective). Interestingly, the percentage of stakeholders opting for direct and indirect emissions is significantly lower for the group of respondents favoring an impact materiality perspective, as displayed in Figure 4. This pattern suggests that it may be less contentious for an assessment of transition risks to include risks arising within a firm's value chain, compared to evaluating a firm's environmental impact and whether its responsibility extends to impacts associated with its value chain. Notably, we find that this difference is mainly driven by investors, as there is no significant difference between the two perspectives if we exclude investors. This result indicates that investors have a narrower conception of a firm's accountability for impact.

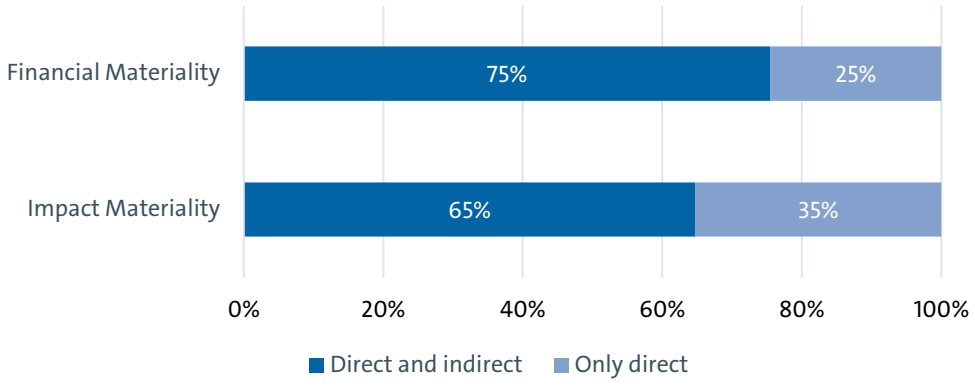

Figure 4 - Materiality Perspective

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