Chapter 21

Cascading Transitional Climate Risks in the Private Sector—Risks and Opportunities

Hans Sanderson and Thomas Stridsland

Abstract Adaptation to climate change poses two recognized significant types of risks to the private sector; (1) physical risks and (2) transitional risks. As markets respond to climate-related policies and shifting demands from customers and investors, opportunities as well as risks are presented. A very recent and important policy development is the European Green Deal suggesting the EU to reduce its emissions from 40 to 55% by 2030, and aiming to enable European countries to meet their Paris Agreement targets. The shift required for this transition highlights the challenges in terms of adapting business models and decision-making tools, while also providing opportunities for innovation and development in the private sector. In order to reach Paris Agreement goals, science-based targets need to be adopted to measure and manage emissions, specifically focussing on Scope 3 emissions embedded in the value chain in the private sector. Methods and guidances are considered, with the ultimate goal being a harmonized methodology to create a detailed emissions inventory and risk disclosure of a company's operations. It is suggested that Environmentally Extended Input–Output models initially be used as a screening tool, in order to identify emission dense sectors. Process-based LCA inventory data, collected through collaboration and transparency throughout the value chain, can then be applied to increase the resolution of the decision-making tool.

Keywords Private sector · Transitional risks · Scope 3 emissions

Introduction

Adaptation to climate change is the management of identified climate-related risks; hence, a prerequisite to cost-effective adaptation is a sound, robust and quantitative

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assessment of the risks. There are several different types of risks associated with climate change, it is, therefore, useful to split these into two large recognized categories, namely; (1) transitional risks and (2) physical risks. This paper addresses transitional risks with a focus on how they affect the private sector. The aim of this paper is to point out some of the main challenges facing the private sector in terms of adapting their decision-making and business models to the current and future transitional climate risk while contributing to a low-carbon economy and future. Transitional risks are systemic societal responses to climate change induced by, e.g. governments, such as increasing CO₂ pricing and taxes, but also novel demands from, e.g. investors, customers and the marketplace. The Task Force on Climate-Related Risk Disclosure (TCFD) (2020) has outline three different types of transitional risks companies need to assess as part of their analysis to comply with the TCFD recommendations (Table 21.1).

It is important to note that transitional risks are not only negative. To the diligent and responsible company, transitional risks represent opportunities in the market, they can exploit via new market developments, improved reputation and branding. From a corporate point of view, the transitional risk climate change represents a significant disruption of the market, and they have to adapt their business model to the new paradigm. The European Green Deal (EU 2020a) is an example of a potentially significant transitional risk. One of the objectives of the Green Deal is to enable the European Community to deliver our greenhouse gas (GHG) emission reductions in accordance with the target of the Paris Agreement to keep the global

Table 21.1 TCFD identified transitional risks

<i>Market and Technology Shifts</i>
Policies and investments to deliver a low carbon emissions economy:
Reduced market demand for higher carbon products and commodities
Increased demand for energy efficient, lower carbon products and services
New technologies that disrupt markets
<i>Reputation</i>
Growing expectations for responsible conduct from stakeholders, including investors, lenders and consumers:
Opportunity to enhance reputation and brand value
Risk of loss of trust and confidence in management
<i>Policy and Legal</i>
An evolving patchwork of requirements at international, national and state level:
Increased input/operating costs for high carbon activities
Threats to securing license to operate for high-carbon activities
Emerging concern about liabilities

Fig. 21.1 **a** Past (blue) and future (red) global GHG emissions in MtC under the RCP 2.6 scenario; **b** Policy revisions needed for meeting GHG emission targets in the EU (EU 2020b)

temperature increase well below 2 °C and closer to 1.5 °C as represented by the IPCC RCP 2.6 scenario (Fig. 21.1a). It is clear that the sharp reduction targets will result in policy changes in several sectors, most of which are still on the drawing board (Fig. 21.1b). In other words, policy changes, GHG emission reduction demands and transition risks must be expected in the private sector. The industry (World Resource Institute (WRI); CDP; World Wildlife Foundation (WWF); United Nations Global Compact) in response have developed the science-based targets' initiative as a means for companies to comply with the Paris Agreement.

The sustainable finance action plan and the European taxonomy on sustainable finance (EU 2019) are vehicles for the Green Deal by steering the finance in a direction to economic investments in low-carbon assets. This is only possible if the market is transparent concerning the climate-related risks companies face (Sanderson et al. 2019). For most companies, the most eminent climate risk is their GHG emissions they need to assess, disclose, and explain how they will reduce these. These demands are developing rapidly as reflected in recent developments related to enhanced GHG emission reduction targets and pledges are considered as conditions in COVID-19 recovery support to private companies moving forward (ECB 2020). GHG accounting and report are in other words moving from an area of relatively lower importance within companies to a higher degree of concern and a risk that need to be assessed and managed in the same way as other significant risks companies need to manage and adaptation of business models.

Methods

As transitional climate risks become more existential to companies the methods to assess and report these must become more complete, clear and harmonized, than they are today as documented by Goldstein et al. (2019). Most companies today use the Greenhouse Gas Protocol (GHG Protocol) (GHG 2020a, b), which has been

developed by the World Resource Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). The GHG protocol provides guidance to the allocation of a company's emissions into three scopes—broadly described as direct and indirect emissions.

Scope 1 includes direct emissions resulting from the company's operation, which can include on-site emissions from, e.g. generators; company-owned or leased vehicles etc. Scope 2 includes indirect emissions associated with purchase of electricity, heat, steam or cooling, but does not account for transmission and distribution. All other emissions are described as Scope 3, which emphasizes emissions embedded in the value chain. The diversity of modern value chains is representative of the complexity a Scope 3 analysis can assume. Scope 3 encompasses upstream and downstream emissions and can include purchased services such as business travels to waste management. Note the risk of double accounting is present in Scope 3 analysis and needs to be avoided. The GHG protocol states that reporting Scopes 1 and 2 is mandatory, while Scope 3 can be considered optional and according to the WRI, some of the largest companies in the world only account and report their Scope 1 and 2 emissions. Most companies today only assess Scope 1 (direct emissions) and 2 (indirect emissions) and not the value chain-related emissions in Scope 3 (EU 2019). However, WRI has found, via a series of case studies, which the emissions along the value chain often represent a company's biggest GHG impacts, e.g. Kraft Foods found that value chain emissions comprise more than 90% of the company's total emissions (GHG 2020a, b). It is clear that inclusion of value chain-related emissions in Scope 3 is needed for an accurate and sound science-based target in compliance with the Paris Agreement.

Scope 3 emissions can be assessed and quantified using several different methods, as illustrated in Fig. 21.3 from Peters (2012). Environmentally Extended Input–Output models (EEIO) provide a top down assessment of all GHG emissions, including Scope 3 emissions. Such a process provides a comprehensive account of the value chain, establishing boundaries at the extraction of raw materials. This is done by coupling internationally available input/output (IO) tables with sector-wide emissions data, to determine emissions based on economic transactions. Despite EEIOs having advantageous coverage of upstream processes, combining sectors can result in sector aggregation errors, which has an effect on the resolution of the output (Acquaye et al. 2018). Alternatively, Life Cycle Assessments (LCA) provide an iterative, bottom-up approach, whereby emissions are quantified per functional unit, resulting in an emission factor (EF). EFs are defined by a detailed assessment of the environmental impact flows associated with the entire (cradle-to-grave) or part (cradle-to-X) of the product life cycle. These distinctions are significant for companies choosing a process-based method as it adds to complexities in defining Scope 3 boundaries. Valuable to this method is clearly defining the boundaries whereby emissions are accounted for, and upholding them throughout the organisation's analysis. Although this method is very detailed, double counting and omissions can occur as truncation errors when different product boundaries vary and are not accounted for (Lee and Ma 2013). Hybrid models incorporate the upstream coverage of EEIO and the downstream detail of LCA data in order to minimize aggregation and truncation

Fig. 21.2 Assessment continuum adapted from Peters et al. (2010)

errors. This requires an elaborate model and absorbs the complexities of both LCA and EEIO methods, resulting in seldom database updates, which can amplify the lessened uncertainties of both methods (Mattila et al. 2010).

Companies documenting their GHG emissions must choose their approach along the assessment continuum (Fig. 21.2), depending on which is most relevant to use as a tool for managing their emissions. It is not easy to orientate and find the right balance between resolution and do-ability, better accurate and pragmatic guidance is needed in this space. There are guidance documents for conducting an EEIO analysis in various multi-regional I/O tables, databases and models (Stadler et al. 2018; Yang et al. 2017), as well as process based and LCA—but there is still a lack of clear guidance and harmonization among the approaches, or combination of approaches, which hampers transparency in the reporting for investors.

The International Organization for Standardization (ISO) has also recently developed a series of standards for organizations to determine their GHG inventories as shown in Fig. 21.3, below.

The standards include quantification of value chain-related emissions in addition to the direct and indirect emissions (ISO 14064-1) and also quantification of GHG removal and sinks the organization may have (ISO 14064-2). The ISO standards are in other words quite comprehensive and complex, and probably beyond the current scope of most companies and organizations as documented by Goldstein et al. (2019). If the ISO standards are made mandatory, most companies and organizations would need to significantly upgrade their inventorying efforts.

Conclusions and Recommendations

As companies and organizations redefine their business models in compliance with their science-based target and the Paris Agreement, the broadening discussion on GHG emissions in the value chain becomes increasingly important. Up and down the value chain, collaboration is key, for these efforts to come together as a positive feedback mechanism. These will see business action cascade across their value chains and move, together, towards a low-carbon future in accordance with the Paris Agreement and the aspirations of the EU Climate Law and Green Deal proposed target of 55% reductions in the EU in 2030 compared with 1990 (Fig. 21.4).

Fig. 21.3 ISO GHG inventory process for organizations

Crucial to this step is accurately assessing emissions such that innovation and development can occur. While EEIO can be used as a screening method to identify emission dense sectors, the nature of the analysis suggests the only action to reduce emissions is to reduce spending. Process-based approaches, however, provide the greatest resolution, which can act as a valuable tool for incorporating science-based targets and aligning with the Paris Agreement goals. By putting an emphasis on unit-based emissions, actors throughout the value chain are compelled to carry out their own assessments of their products, as a demand for emissions accountability grows. If ISO GHG standards are adopted as mandatory requirements, potentially conservative default values within Scope 3 can be defined. Doing so can incentivize companies and organisations to carry out Scope 3 analyses for a more accurate and less impactful representation of their company. While the disruption of climate-related transitional risks and associated complexities create challenges to companies addressing their Scope 3 emissions, it also creates huge opportunities for collaboration and innovation. Producers can develop innovative products and businesses that can open new markets

Fig. 21.4 EU total reduction targets

by adapting the way they do business in the value chain. GHG emissions can maybe in the future become an integrated part of value chain transactions much in the same way as money is today. Similarly, transparency of emissions accounting can be held to the same standard as economic transparency, e.g. beyond the nonfinancial disclosure in the stock exchanges. However, without the right standard method of GHG accounting, the concept of transparency in the market and green deal is difficult to ensure. This means that now is a key moment for defining a harmonized accounting method, as well as a pivotal time for companies to acknowledge their emissions, use the information to reduce them, and ensure their preparedness in the green transition. We recommend that value chain-related emission analysis and methods are included in the expertise areas of the Platform on Sustainable Finance (EU 2019) that need further clarification. There is a need for greater harmonization of practical guidelines for the assessment of value chain-related emissions to the industrial and financial sectors so they can accurately assess cascading transitional climate-related risks in the private sector (Sanderson 2021).

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