

From EBIT to SEBIT (Sustainable EBIT): Sustainable Performance Accounting (SPA) using the Example of CO₂ Accounting

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Corporate sustainability reporting has become increasingly important in recent years. However, conventional approaches reach their limits when it comes to quantifying and measuring the actual sustainability performance of a company. This article presents a new approach: Sustainable Performance Accounting (SPA), which is based on an extension of bookkeeping by including ESG bookkeeping. SPA enables companies to systematically measure and manage their sustainability performance. The article provides an overview of the basics of SPA methodology and uses a comprehensive example showing how SPA can be implemented in practice. The article is aimed at interested readers from science and practice as well as decision-makers who are interested in future-oriented sustainability reporting.

Keywords: CO₂ accounting, CO₂ emissions, CSRD, ESG (Environmental, Social, Governance), ESG bookkeeping, ESG provision, ESG asset, ESRS, integrated financial reporting, internalisation of external effects, connectivity, monetisation of ESG issues, sustainability, sustainability indicators, negative emissions, sequestration performance, Sustainable Performance Accounting (SPA)

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Initial Situation

From the business year 2024, the first European companies have to prepare a sustainability report in accordance with the Corporate Sustainability Reporting Directive (CSRD)² in conjunction with the EU Taxonomy Regulation³ (EU TR). This sustainability report must be published in the management report as part of corporate reporting and is also subject to an audit requirement. The scope of such a sustainability report is largely determined by the applicable European Sustainable Reporting Standards (ESRS).⁴ Sustainability in the sense of the CSRD and the ESRS comprises the three sub-areas Environment (E), Social (S) and Governance (G) and is abbreviated as ESG. An initial set of 12 sector-agnostic ESRS stipulates a considerable number of disclosure requirements with an extensive number of data points on various ESG issues.⁵ Further reporting obligations from sector-specific ESRS will be added in the future.

The multidimensional and increasingly quantitative approach of the CSRD represents an important step towards integrated financial and sustainability reporting, which recognises all stakeholders as the recipients of the report⁶ - and not primarily the equity capital providers (shareholders) and debt capital providers (lenders, creditors) as is the case with traditional financial reporting. However, due to the large number of additional data points in the management report, there is a risk of information overload,⁷ especially as an overload of information can already be observed in some cases of financial reporting without a sustainability report.⁸ Such a supposed overload of information in the management report also poses the risk of a loss of quality in corporate reporting for stakeholders, with the risk of a lack of visibility of management-relevant parameters.

The CSRD makes sustainability reporting⁹ part of (consolidated) management reporting, but not of accounting itself. There is no internalisation of positive and/or negative external effects¹⁰ of sustainability (ESG)

² CSRD - Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, OJ L 322, 16.12.2022, p. 15.

³ EU TR - Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, OJ L 198, 22.6.2020.

⁴ ESRS - Commission Delegated Regulation (EU) by 31.7.2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards.

⁵ The last draft before finalisation provided for up to 84 disclosure requirements with up to 1,144 data points. Cf. draft of ESRS Standards as at 22 November 2022, cf. EFRAG, Cover Letter on the Cost-benefit analysis of the First Set of draft ESRS, November 2022, p.2.

Delegated Regulation 2013/34/EU l.c. (fn. 2), the EU Commission has weakened the draft with regard to the scope of the report. This includes simplifications with regard to the data to be reported. Companies with fewer than 750 employees are granted transitional periods for reporting certain data points. In addition, certain reporting obligations have now become reporting options. See GASB Briefing Paper: European Commission launches consultation on Set 1 of the ESRS, undated, p. 2.

The mandatory digital reporting of sustainability information – by means of the ESEF (European Single Electronic Format) - is intended in particular to enable (automated) analysis and comparability of sustainability information.

⁶ With regard to the model-based categorisation of sustainability reporting, see also: Brösel/Rühlmann/Freichel, Nachhaltigkeitsberichterstattung im Spannungsfeld der betriebswirtschaftlichen Modelltheorie; in: Richter et al (eds.), Anwendungsorientierte steuerliche Betriebswirtschaftslehre, Berlin 2022, pp. 301-314. For a relevant international source for a general classification of the topic, see also: Christensen, Hans B.; Hail, Luzi; Leuz, Christian: Mandatory CSR and sustainability reporting: economic analysis and literature review, in: Review of Accounting Studies (2021) 26, 29.08.2021, pp. 1176-1248.

⁷ Cf. Brösel/Rühlmann/Freichel, loc. cit. (fn. 6).

The authors submitted a statement to EFRAG on the topic of “information overflow” and SPA as part of the ESRS comment letter in 2022. See University of Applied Sciences Emden/Leer, Regionalwert Research gGmbH, EFRAG Sustainability Reporting Board Consultation Survey 1A, Comments to EFRAG on questions 8 to 12, 8 August 2022.

⁸ See “Disclosure Initiative” of the IASB.

⁹ The official term in the ESRS is “sustainability statement”. This article continues to use the established term “sustainability report” as a synonym.

¹⁰ When companies generate costs for others that they do not bear themselves, these are known as negative externalities. If

in the balance sheet and income statement.¹¹ ESG issues are therefore not included in the income statement, although the figures from the income statement in particular have a significant influence on the management of the company as a whole¹², and on the remuneration of the Executive Board and consequently on the main decision-makers in companies.¹³ It should be noted that a few sustainability issues, mostly relating to climate aspects, are already subject to accounting under certain conditions (e.g. HGB and IFRS), but are not considered further in this article.¹⁴ The HGB (Handelsgesetzbuch) defines German accounting law and, in this article, is representative of European accounting law.

The new sustainability indicators of taxonomy-compliant¹⁵ sales revenues, capital expenditures (CapEx) and operational expenditures (OpEx)—to be reported in accordance with the CSRD in conjunction with the EU TR - combine initial financial and sustainability-related information in a few key figures. This allows initial insights to be gained for corporate management. The three new sustainability indicators will (in future) be based on audited financial information from bookkeeping. In this way, sustainability information can gain greater acceptance within the company and among stakeholders and lose the strong qualitative or narrative character that is often perceived as a shortcoming.¹⁶

In Germany, for example, the integration of sustainability issues into accounting was regulated at national level as part of the coalition agreement 2021: “We want to integrate ecological and, where appropriate, social values into existing accounting standards in dialogue with the business community, starting with greenhouse gas emissions”.¹⁷ Integration in this context also includes the possibility of recognising sustainability issues in the

companies generate benefits for others that go beyond their own advantage, but do not receive anything in return, there are so-called positive externalities. See Coase, The Problem of Social Costs, in: *Journal of Law and Economics* 1960, pp. 1-44.

¹¹ Cf. Vogt, Joachim; Hüppin, Ursina; Dravec, Melani; Internalisierung von Umweltkosten in das Rechnungswesen, *IRZ* 2023, p. 298. On the general topic of the internalisation of positive and negative external effects of sustainability, see Schreiner, Manfred, *Umweltbezug des Rechnungswesens, Umweltmanagement in 22 Lektionen - Ein ökonomischer Weg in eine ökologische Wirtschaft*, Wiesbaden. 1996, p. 252 ff. On internalisation in the context of sustainable performance accounting, see Walkiewicz, J., Lay-Kumar, J., & Herzig, C. (2021). The integration of sustainability and externalities into the “corporate DNA”: a practice-oriented approach. *Corporate Governance: The International Journal of Business in Society*. www.emerald.com/insight/content/doi/10.1108/CG-06-2020-0244/full/html.

¹² More than half of the financial performance indicators of the German blue-chip companies (DAX 30) in 2014 were earnings and profitability indicators. See KPMG, *Accounting Insights | DRS 20 - Implementation Analysis DAX 30*, p. 22.

¹³ In 2015, more than half of the KPIs used by the DAX 30 management boards - both for one-year and multi-year variable remuneration - were based on earnings and profitability indicators. See Aust, Victoria, Which KPIs do the DAX 30 companies use in management board remuneration? *IRZ* 2018, Fig. 3, p. 395.

¹⁴ Climate risks in particular are already partly the subject of accounting. On IFRS accounting see, among others: 1a) IDW, *Fragen und Antworten zur Berücksichtigung von ESG-bezogenen Aspekten in IFRS-Abschlüssen*, 21 December 2021, 1b) Buchberger, Florian, Richter, Frank, *Bedeutung von umweltbezogenen Faktoren für die Rechnungslegung*; *IRZ* 2023, pp. 29-34. For HGB accounting, see, among others: 2a) Lanfermann, Georg; Morich, Sven; Bultmann, Olga; *Berücksichtigung klimabebezogener Aspekte im handelsrechtlichen Abschluss*, *Der Betrieb*, Nr. 24 vom 22.08.2022, pp. 1977-1983, 2b) Reinke, Jens; Müller, Stefan; *Effects of climate and environmental aspects on HGB financial statements—Conclusions from the relevant notes published by the IDW on first selected HGB assets*, *BC Zeitschrift für Bilanzierung, Rechnungslegung und Controlling*; 2022, pp. 250-255.

¹⁵ Delegated Regulation on environment KPI—Annex I of Commission Delegated Regulation (EU) 2021/2178 of 6 July 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by specifying the content and presentation of information to be disclosed by undertakings subject to Articles 19a or 29a of Directive 2013/34/EU concerning environmentally sustainable economic activities, and specifying the methodology to comply with that disclosure obligation, OJ L 443, p. 17 For an overview of all potential taxonomy-compliant economic activities, see Henkel, Knut; Lay-Kumar, Jenny; *EU Taxonomy: Overview of all “green” economic activities as of 13 June 2023*, *KoR* 7-8/2023 pp. 316-324.

¹⁶ Beyhs, Oliver; Hirsch, Bernhard; Maske, Miriam; *Suitability of the EU taxonomy KPIs for corporate management*; *KoR* 7-8/2023 p. 315.

¹⁷ SPD, BÜNDNIS 90/DIE GRÜNEN, FDP; *Coalition Agreement 2021 - 2025, Dare more progress—Alliance for freedom, justice and sustainability*, p. 170 f.

balance sheet and income statement.¹⁸

Sustainable Performance Accounting (SPA)¹⁹ goes well beyond CSRD, moving towards connectivity²⁰ and thus a stronger integration of financial and sustainability reporting. According to the authors, consistently applying disclosure requirements means presenting all operational risks, including ESG-related risks, in the balance sheet and income statement.²¹ ESG issues should be recorded in accordance with bookkeeping and accounting rules in order to consistently integrate sustainability into corporate management.²² There are already methods that also monetise ESG issues, but not at the bookkeeping and accounting level.²³ SPA proposes an integrated accounting method that puts sustainability performance and costs on an equal footing with financial indicators: S accounting (S as abbreviation for sustainability). ESG issues are recorded in a separate ESG accounting system²⁴. ESG accounting can be used to derive sustainable carrying amount-related performance indicators that are important and already established for corporate management, analysis and evaluation, such as annual profit, earnings before interest and taxes (EBIT) or return on equity (ROE).²⁵ This would ensure that, despite the wealth of information in the management report, a holistic management and information function is not diluted.

Sustainable performance accounting is based on the understanding that all economic activities are integrated into socio-ecological contexts, on whose intact functionality the economic success of the company is more or less dependent. Corporate responsibility does not only cover the company itself but extends to successful economic activity within planetary boundaries and the contribution to the common good. Sustainable management in the areas of Environment, Social and Governance (ESG) is seen as a central component of corporate success, while non-sustainable management is seen as risky. To date, positive and negative ESG effects have been excluded from the internal and external income statement as externalities. However, research on

¹⁸ Cf. Lay-Kumar/Henkel, blog post on “ESMT-Workshop zur Integration von CO₂ in die Rechnungslegung”, 13.01.2023, (www.regionalwert-research.de/blog/; accessed: 19.07.2023).

¹⁹ SPA is based on the following preliminary work: 1) Hiß, Richtig rechnen! Through the reform of financial accounting to an ecological-economic turnaround. Munich, 2015. 2) Lay-Kumar et al. Final report QuartaVista, report section Regionalwert AG Freiburg, 2021 (www.quartavista.de/; accessed: 04/04/2022); Lay-Kumar et al. Sustainable Performance Accounting. Position paper for the Science Conference, 2022, www.regionalwert-research.de/wp-content/uploads/2022/12/Positionspapier-Sustainable-Performance-Accounting_Regionalwert-AG-Freiburg-2022.pdf.

²⁰ The subject of connectivity is issues relating to the linking of financial and sustainability reporting. See, among others, Sellhorn, Thorsten, Aus einem Guss?—Connectivity of corporate reporting, 15 March 2023 (www.linkedin.com/pulse/aus-einem-guss-konnektivit%2525C3%2525A4t-der-unternehmensberichterstattung%3FtrackingId=7oUcuIr22%252B%252FDh1u2Si3xiA%253D%253D/?trackingId=7oUcuIr22%2B%2FDh1u2Si3xiA%3D%3D; accessed: 18 March 2023). EFRAG has initiated a “Connectivity Advisory Panel” on the topic of connectivity (www.efrag.org/News/Project-648/Launch-of-the-EFRAG-Connectivity-Advisory-Panel---Composition-and-related-community-?AspxAutoDetectCookieSupport=1; accessed: 18 March 2023).

²¹ Cf. Lay-Kumar et al, 2022 (fn. 19).

²² Ibid.

²³ In true cost accounting (TCA), the prices of products in the agricultural and food sector are calculated holistically, taking into account negative external effects. The Value Balancing Alliance (VBA) methodology modifies the enterprise value to include various aggregated ESG factors. In the Environmental Profit and Loss (EP&L) methodology used by Puma S.E., environmental issues are monetised in the income statement. In the Economy for the Common Good, individual sustainability issues are scored, and an overall score is calculated.

²⁴ In practice, larger companies generally already have different bookkeeping systems in place, whereby the accounting of individual operating sites and/or subsidiaries, for example, is mapped via ledgers. Additional bookkeeping, e.g. for ESG bookkeeping, can usually be set up without major effort. SAP is considering offering a “green ledger”. Cf. Sessar, Christopher, 03/09/2023 (www.corporate-reporting.com/artikel/sap-greenledger?locale=en_us).

²⁵ Regarding the use of earnings-before-ratios in the 2021 annual reports of the DAX 40 companies, see Schluter, Anna; Kümpel, Thomas; Ist eine Reform der Earnings-before-Kennzahlen notwendig? A critical analysis of the DAX 40 companies based on the 2021 annual reports; WPg 15-16/2023, Fig. 3, p. 859.

externalities has shown for decades that today's economy, which is focussed on efficiency and short-term financial success, generates risks, losses and damages to the economic foundations, which in turn have negative impacts on operational production conditions in the long term. This means that unsustainable economic activity not only impacts the environment and society, but also companies and business management itself.²⁶ The view that these are "non-financials" is being replaced in public discourse by the term's pre-financials²⁷ or ESG issues, which can have both a financial materiality and an impact materiality. For example, the previous designation of the "Non-Financial Reporting Directive" (NFRD) was no longer considered appropriate in the EU and "non-financial" was replaced by "sustainability" in the successor regulation to the CSRD.²⁸

The Sustainable Performance Accounting (SPA) methodology presented here is generally applicable to all ESG issues. This article focuses on CO₂ emissions as one example, as an aspect of the Environment (E) sub-area, as this topic is currently the primary focus within the EU with regard to Net Zero 2050. CO₂ emissions can relate to both emitted CO₂ emissions and the sequestration of CO₂ emissions (known as negative emissions).²⁹

Limits of Current Accounting

In order to integrate sustainability issues into management-relevant performance indicators, into particular earnings and profitability indicators, they must be posted in bookkeeping. However, this is not possible without further steps, as both HGB and IFRS require certain recognition criteria to be met for assets to be recorded as assets, and these are not met for the ESG issues discussed here. The same applies to recording provisions as a liability. Ultimately, it boils down to the fact that for most ESG assets, there is no cash flow probable, assets and also probably no cash outflow for ESG liabilities.³⁰ From a holistic perspective, this leads to unsatisfactory results: sustainable business practices not only do not lead to an advantage, they actually lead to a disadvantage, as ESG matters are not taken into account in the accounting nor in the key performance indicators. This is illustrated by the following simple numerical example.

Numerical Example

Companies A and B are identical companies. They both generate €100 million in sales revenues, and neither is subject to the CO₂ emissions trading system. Companies A and B both invest in a new production plant. Company A buys the cheapest plant and pays €125 million. The plant emits 800,000 (K) tonnes (t) of CO₂ per year. Company B, on the other hand, is keen to purchase a machine that emits as little CO₂ as possible. Company B pays €250 million for the production plant, which emits half as much CO₂ as the plant of company A. Both

²⁶ Cf. Walkiewicz, J., Lay-Kumar, J., & Herzig, C. (2021). The integration of sustainability and externalities into the "corporate DNA": a practice-oriented approach. *Corporate Governance: The International Journal of Business in Society*. www.emerald.com/insight/content/doi/10.1108/CG-06-2020-0244/full/html (accessed 17/09/2023). Breyer/Kolmar, *Grundlagen der Wirtschaftspolitik*, in: Mohr/Tol, *The economic impact of climate change. Perspektiven der Wirtschaftspolitik* 11, 3rd ed., Tübingen, 2010, pp. 13-37; Hansjürgens? *Zur Neuen Ökonomie der Natur: Kritik und Gegenkritik*, in: *Wirtschaftsdienst*, Vol. 95, No. 4, 2015, pp. 284-291.

²⁷ Cf. IDW (ed.), IDW position paper "Sustainable Finance as part of the sustainable transformation—implications for credit institutions", Düsseldorf, 2020, p. 13.

²⁸ Cf. CSRD, loc. cit. (fn. 2), whereas reason (8).

²⁹ CO₂ is the best known of a total of 6 greenhouse gases. Ultimately, it refers to the totality of all greenhouse gases, which are quoted in the unit CO₂ equivalents (CO₂ eq). CO₂ is also used in this article as a synonym for all greenhouse gases.

³⁰ Under HGB, assets must, among other things, be independently realisable. In the case of assets under IFRS, there must be a right of disposal (control right) for the economic resource (CF 4). For a provision, there must be a current obligation for the entity to transfer an economic resource (HGB/ CF 4). In addition, according to the HGB the "pagatoric (cash-based) principle" is to be applied, whereby all revenues and expenses must be based on actual payment transactions (Section 252 (1) no. 5 HGB). All of this presupposes probable cash inflows (assets) or outflows (liabilities).

machines are depreciated on a straight-line basis over the useful life of 25 years. This means that company A depreciates €5 million per year and company B €10 million. The measurement of CO₂ emissions is based on the exchange price of €70/t CO₂ quoted in the European CO₂ emissions trading system (EU ETS).³¹

In traditional financial bookkeeping (F bookkeeping) and accounting (F accounting) - according to the left side of Figure 1 - both companies would each record €100 million as revenue in the income statement (P&L) (1A, 1B). In addition, company A must record an annual depreciation of -€5 million (2A) and company B -€10 million (2B) in the P&L. This reduces the carried as an asset acquisition costs for company A from €125 million to €120 million and for company B from €250 million to €240 million at the end of the first business year. This results in EBIT (A) of €95 million and EBIT (B) of €90 million. Due to the higher depreciation on the more sustainable investment of company B, EBIT (B) is lower than EBIT (A). This is an unsatisfactory result from a holistic, sustainability-integrating accounting perspective and is due to the fact that the negative external effects of CO₂ emissions are not allowed to be recorded in F bookkeeping, as the accounting recognition criteria of a provision under HGB and IFRS are not fulfilled.

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Figure 1. Bookkeeping example for CO₂ emissions.

Sustainable performance accounting offers the following solution to this dilemma: sustainability-related entries are recorded in a second bookkeeping system, ESG bookkeeping. As shown in the middle section of Figure 1, a provision of €56 million (800,000 tonnes of CO₂ * €70/t CO₂) is to be recorded as an expense for the CO₂ emitted by company A (3A).³² As company B only emits half of the CO₂ due to the more sustainable plant,

³¹ Orientation towards the exchange price is one of several conceivable monetisation approaches for CO₂. See section 3.2 SPA accounting.

³² Notes on entry of the provisions:

1) The example abstracts from the entry of deferred taxes. If the national legislator were to (not) promote sustainable business practices for tax purposes and exempt ESG income from taxation (prohibit the deductibility of ESG expenses), no deferred taxes would have to be recorded in ESG bookkeeping.

the provision to be recorded by company B amounts to €28 million (3B).

Adding the entries from F and ESG bookkeeping results in the entries in sustainable bookkeeping, S bookkeeping. This forms the basis for the holistic performance indicator SEBIT³³; see the right-hand side of Figure 1. SEBIT (A) thus amounts to €39 million and results from €100 million in sales revenues and -€5 million in depreciation, both from F bookkeeping, and -€56 million in expenses for CO₂ emissions from ESG bookkeeping. SEBIT (B), on the other hand, amounts to €62 million. This results from €100 million in sales revenues and -€10 million in depreciation, both from F bookkeeping, as well as -€28 million in expenses for CO₂ emissions from ESG bookkeeping. When using SEBIT, the more sustainable company B now also shows a higher performance with €62 million than company A with €39 million. As SPA is based on the principle of double-entry bookkeeping, inventory figures are also included in this concept. The SPA concept is presented in full in the following chapter.

Conception of SPA

Sustainable Accounting

According to SPA, the real sustainability-integrated performance of a company should be reflected as closely as possible in the bookkeeping. The focus here is on the positive and negative material effects of doing business, analogous to the materiality analysis, which categorises positive and negative effects (ESRS 1, 43 ff.). To date, many ESG performances and risks have not been recorded in full in the bookkeeping, so that it is not apparent which ESG performance is provided, or risks avoided. SPA uses traditional accounting methods, i.e. analogous to the generally accepted accounting principles (GAAP), which give a true and fair view of the assets, liabilities, financial position and profit or loss of a company.³⁴ ESG information is recorded and can be presented in more detail or in aggregated form, as required.³⁵ For a fully sustainability-integrated income statement, all positive and negative ESG effects³⁶ would therefore have to be systematically recorded in the bookkeeping system. Even a partial integration of material ESG issues makes it possible to determine a more sustainable true

2) If the companies were covered by the CO₂ emissions trading system, CO₂ accounting would already be subject to F bookkeeping.

3) In the example, the total CO₂ emissions were assessed, as these could in principle also be asserted retroactively in the context of legal proceedings. Wrede, Insa; Klimaklagen: Unternehmen vor Klagewelle? Deutsche Welle (DW), 01.03.2023 (www.dw.com/de/mehr-klimaklagen-gegen-unternehmen/a-64830154; accessed: 19.03.2023).

³³ SEBIT = Sustainable EBIT. Regarding the use of “SEBIT”, see also Geschwindner/Eser/Haubold, DATA—a sustainable performance accounting framework for SMEs. From macro planetary boundaries to micro economic Sustainable Earnings Before Interest and Tax - SEBIT, *Jornal of Business Chemistry*, 02.06.2023, pp. 112-122.

³⁴ Orientation towards GAAP appeared to be a pragmatic approach for the beginning. In the medium term, a type of “Generally accepted sustainable accounting principles” (GASAP) would probably have to be developed. The IDW (Institute of Public Auditors in Germany) proposes an “ESRS general standard” analogous to financial reporting. “In the relevant financial reporting frameworks, the general standard aims to ensure that reporting as a whole conveys a true and fair view.” Cf. IDW, Erreichte Erleichterungen in den ESRS unbedingt beibehalten! 07.07.2023 (www.idw.de/idw/medien/presseinformationen/idw-erreichte-erleichterungen-in-den-esrs-unbedingt-beibehalten.html; accessed: 16.08.2023). The integration of ESG issues into flows is already partly the subject of triple bottom line approaches.

³⁵ Cf. Lay-Kumar et al. (2023), Sustainable Performance Accounting as the key to sustainability transformation; in: Jeromin/Zwick (eds.): *Dynamising the transformation with sustainable finance*. Springer Gabler, Wiesbaden. www.doi.org/10.1007/978-3-658-38044-1_14, pp. 187-199.

³⁶ Only sustainable public good performances and costs are recognised here as positive and negative effects in ESG bookkeeping, but not sustainable performances and costs that exclusively benefit the company. The distinction between sustainability-related business assets and common good assets was first discussed in Lay-Kumar, J./Stockinger, A. (2021), *Unternehmerisches Gemeinwohlerengagement am Beispiel Streuobstwiesen - Experimentierraum QuartaVista meets Streuobst*, in: GeZu 4.0 (ed.), *Gemeinsam Zukunft gestalten, Vom Experimentierraum zur erfolgreichen Community-Buch*, pp. 29-32. (www.visual-books.com/gezu40/, accessed 12/09/2023).

and fair view of the assets, liabilities, financial position, and profit or loss of a company. Financial analyses as well as academic and empirical studies confirm the need to go beyond financial reporting in order to better record the company's value creation.³⁷ SPA thus positions itself at the interface between business administration (financial accounting) and economics.

This article deals with examples from the area of climate change (ESRS E1). A negative external effect arises from CO₂ emissions, which are recognised as a CO₂ provision in ESG bookkeeping. This affects all sectors to a greater or lesser extent. A positive external effect arises from the sequestration (rebinding) of CO₂ in agricultural soils. This is internalised through recording of (internally generated) ESG assets as assets. This relates to all forms of CO₂ sequestration in agriculture, i.e. the storage of CO₂ in agricultural soils.³⁸ CO₂ sequestration performance could also be the subject of CO₂ certificates (e.g. humus certificates), which buyers can use to reduce their own gross CO₂ emissions. In contrast to CO₂ certificates which are difficult to trace on distant areas, the ongoing of CO₂ sequestration in domestic agriculture can be clearly monitored.³⁹ Due to their pagatoric (cash-based) nature, however, the latter must already be recorded in F bookkeeping.

In accordance with the SPA methodology, traditional financial bookkeeping (F bookkeeping) is expanded to include ESG bookkeeping to create integrated and therefore sustainable and holistic (sustainability S) bookkeeping (S bookkeeping). The following applies:

$$\begin{aligned} \text{S bookkeeping} &= \text{F bookkeeping} + \text{ESG bookkeeping}^{40} \\ (\text{S balance sheet} &= \text{F balance sheet} + \text{ESG balance sheet or S P\&L} = \text{F P\&L} + \text{ESG P\&L}) \end{aligned}$$

Sustainable bookkeeping (S bookkeeping) in SPA stands for sustainability in the broad sense. According to SPA, a company's success is sustainable if its business activities are financially viable and all ESG issues (sustainability in the broad sense) have been taken into account in this calculation. The recipients of S bookkeeping are all stakeholders, not primarily capital providers as is the case with HGB and IFRS. Many non-capital stakeholders are interested in holistic reporting per se. However, ESG information is also becoming increasingly important for debt capital providers (main focus of HGB) and equity capital providers (main focus of IFRS), as it increasingly represents pre-financials and will e (in the medium term) have an influence on creditworthiness and the value of the company.

Sustainability performance indicators (S) can be determined and explained on the basis of S bookkeeping. Unlike F bookkeeping items, ESG bookkeeping items are not necessarily derecognised from bookkeeping due to

³⁷ Cf. EFRAG (ed.), Draft ESRG 1 Double materiality conceptual guidelines for standard-setting. Working paper, January 2022, para. 26 on p. 25.

³⁸ CO₂ sequestration also includes the CO₂ captured during production and then stored underground. This is also referred to as "carbon dioxide capture and storage" (CCS). However, this type of CO₂ storage is not legally permitted in Germany and is therefore not the subject of this article. In agriculture, there are various types of CO₂ sequestration techniques that lead to different costs of production. Examples are rewetting of peatlands, agroforestry, permanent grassland, covering the soil with catch crops, use of biochar and humus build-up. The calculation of CO₂ sequestration is highly complex. On the latter, see, among others, Don, Axel; Drexler, Sophie; Negative emissions through humus formation in soils - how much is possible? - Energy Future in Dialogue, Stiftung Energie Klimaschutz, 17.07.2023 (www.energie-klimaschutz.de/negative-emissionen-durch-humusaufbau-in-boeden-wie-viel-ist-moeglich/; accessed: 31.07.2023). For the calculation of carbon footprints in agriculture, please refer to the calculation standard of the Kuratorium Technik & Bauwesen in der Landwirtschaft: www.ktbl.de/themen/bek.

³⁹ For example, by identifying the areas in arable land registers or the joint agricultural application.

⁴⁰ SPA combines the so-called Triple Bottom Line (ecology, economy, social issues; cf. e.g. Elkington, John, Enter the Triple Bottom Line, 1994) with ESG of CSRD.

the absence of cash payments. In these cases, derecognition takes place within the framework of SPA against the new equity position⁴¹ of ESG capital.⁴² This item is in turn subdivided into the three ESG capital sub-items⁴³; Environmental (E), Social (S) and Governance (G). The nature of ESG capital is similar to the consolidated financial statements equity item “shares of other shareholders” (Section 307 HGB).⁴⁴ However, the entitlement to ESG capital is based on an implicit not explicit contract with the general public.⁴⁵

When an asset is derecognised in exchange for ESG capital, the company has provided ESG benefits (public benefits) to the general public free of charge, in this case for climate change mitigation through CO₂ sequestration. Derecognition takes place when “operational readiness” has been established. In bookkeeping terms this is a kind of withdrawal from the general public, which is recognised as a debit entry in the ESG capital account. From a holistic balance sheet analysis perspective, this should be evaluated positively. If such an accounting method were to become the basis of a transfer payment from the state or a cash payment from a private donor, liquidity would flow to the company.⁴⁶

The situation is different for the derecognition of a provision against ESG capital. Derecognition occurs when the reason for recognising the provision no longer applies. In this case, the company has transferred ESG costs to the general public without having paid for them (e.g. CO₂ emissions). In bookkeeping terms this is a kind of contribution in kind by the general public, which is recognised as a credit entry in the ESG capital account. From a balance sheet analysis perspective, this should be evaluated negatively. If such an accounting method were to become the basis of a transfer payment by the state, the company would have to pay money to the general public (the state). In principle, it is conceivable that a credit balance of ESG capital could be used as an assessment basis for ESG taxation, which would then be used to finance ESG benefits.

The following four steps (SPA 1 to SPA 4) are required to implement Sustainable Performance Accounting (SPA):

- ESG accounting
 - (1) SPA 1 Recognition in ESG bookkeeping
 - (2) SPA 2 Reporting in ESG bookkeeping
 - (3) SPA 3 Measurement in ESG bookkeeping
 - SPA 3a Determination and interpretation of indicators
 - SPA 3b Monetisation

⁴¹ With regard to the basic idea that stakeholders other than the traditional shareholders (such as shareholders in the case of ESG capital) can also be entitled to a company's equity, see, among others, 1) Anthony, R. N. Tell It Like It Was: A Conceptual Framework for Financial Accounting. 1983 and 2) Otaka, Satoru, Rethinking the Concept of Equity in Accounting: Origin and Attribution of Business Profit, in: The Journal of Accounting, Economics, and Law, 22 July 2020 (www.degruyter.com/document/doi/10.1515/acl-2019-0018/html; accessed: 22 July 2020).

⁴² In addition to the “equity option” chosen here, a “liability option” or an “asset option” are also conceivable. Cf. Lay-Kumar/Henkel, loc. cit. (fn. 18). Detached from the new equity sub-account ESG capital, all postings in the ESG P&L are finalised as usual via the equity sub-account “retained earnings” or “accumulated profit/loss”.

⁴³ In analogy to the “Other Comprehensive Income” (OCI) of IFRS; see IAS 1.82A. The aggregated ESG values of the past can thus be reported broken down into the three sustainability areas E, S and G.

⁴⁴ “Shares of other shareholders” is an adjustment item in the consolidated balance sheet for shares in subsidiary undertakings included in the consolidated financial statement that do not belong to the parent undertaking.

⁴⁵ Regarding the entitlement to the equity of other stakeholders through implicit contracts, see Otaka, loc. cit. (fn.41), p. 16 f. ESRS 1.AR7 explicitly recognises nature as a potential “silent stakeholder”. For example, the use of proxies is conceivable here, e.g. organisations that are legitimate representatives or which the company assumes adequately represent the stakeholders. Cf. EFRA, Implementation guidance for the materiality assessment, 08/2023, para. 184c p. 38.

⁴⁶ One example of this is state funding in Germany for the rewetting of peatlands as part of the National Peatland Protection Strategy. www.bmu.de/download/nationale-moorschutzstrategie (accessed 12/09/2023).

- + Sustainable Performance
 - (4) SPA 4. Determination and explanation of S performance
 - SPA 4a Determination of S performance
 - SPA 4b Explanation of S performance
- = Sustainable Performance Accounting (SPA)

ESG Accounting

Continuation of the numerical example. The bookkeeping issues in ESG bookkeeping are explained below using a simplified continued numerical example for company B from chapter 2. In year 01, company B prepares a half-year financial statement at time $t1$ and an annual financial statement at time $t2$. The company only emits CO₂, amounting to 400,000 tonnes of CO₂, as part of its own production in the first half of the year. However, Company B also sequesters 50,000 tonnes of CO₂ - as part of an agricultural operation - also only in the first half of the year. The production of sequestration is completed at time $t1$ but does not develop its sequestration capacity until the end of the year ($t2$). The costs of production of the sequestration amount to a total of €40/t CO₂ and result from material and labour costs. Company B is not subject to the CO₂ emissions trading system. The exchange price for CO₂ (EU ETS) increases from €60/t ($t1$) to €70/t ($t2$). In principle, Company B could be sued in court for its CO₂ emissions; however, it considers this probability to be low. EBIT at the end of the year amounts to €90 million.

SPA 1 Recognition in ESG bookkeeping. Firstly, the ESG issues to be recorded in ESG bookkeeping must be determined. The (sub)subtopics of the topic related ESRS provide guidance here.⁴⁷ All ESG matters that have been identified as material for the company in accordance with double materiality (ESRS 1 Chapter 3) and which are therefore subject to sustainability reporting must be recorded.⁴⁸ This applies to all matters of both financial materiality and impact materiality.

Regarding the accounting of CO₂ issues, the focus is on the “climate change mitigation” sub-topic of the “climate change” standard (ESRS E1). Reporting on gross CO₂ emissions is governed by the ESRS E1-6 disclosure requirements, according to which all greenhouse gases emitted by the company must be disclosed as per the Greenhouse Gas (GHG) Protocol. As part of the ESRS E1-7 disclosure requirement, information on the reduction of GHG must also be disclosed. This includes the removal of GHG as part of the company's own activities and within the upstream and downstream value chain, as well as GHG mitigation projects financed through carbon credits.

In ESG bookkeeping, a basic distinction must be made between two issues. ESG matters that cause negative external effects are entered as ESG provisions. This relates to CO₂ emissions. Items that generate a positive external effect are entered as ESG assets. These are CO₂ sequestration measures that lead to negative CO₂ emissions.

⁴⁷ According to ESRS 1.AR 16G, 10 topics (standards) are the subject of the first set of ESRSs, which contain a total of 38 subtopics and 69 sub-subtopics. Non-reporting entities can also use these as a guide.

⁴⁸ In principle, SPA does not specify which ESG factors must be reported as this depends on the company-specific relevance of the topics. Reference points for the external review include the international Sustainable Development Goals (SDGs), the planetary boundaries and the Paris Agreement. The ESG issues listed in the CSRD and the ESRS represent an important but still incomplete reference. See also: EFRAG, loc. cit. (fn. 41), para. 149-152, p. 46 f.

The counterpart to recognition is derecognition. Overall, the following bookkeeping constellations can arise - in conjunction with F bookkeeping - regarding the recognition or derecognition in ESG bookkeeping:

- Recognition 1

In ESG bookkeeping, an ESG transaction is posted for the first time without an entry having previously been made in F bookkeeping.

Example: Initial recognition as a liability of a CO₂ provision for the CO₂ emissions generated during production by company B.

- Recognition 2

The matter was already recognised as affecting profit or loss in F bookkeeping. Through reclassification in ESG bookkeeping, it is now carried as an asset or a liability.

Example: The expense for CO₂ sequestration recognised in Company B's F bookkeeping is carried as a sustainable asset in ESG bookkeeping.

- Derecognition 1

No cash flows in connection with the ESG matter. In this case, the ESG item is to be derecognised against the new equity item "ESG capital". Assets are derecognised when "operational readiness" has been established, and provisions are derecognised when the reason for recognising the provision no longer applies.

Example: The asset for CO₂ sequestration recorded in ESG bookkeeping for company B is derecognised in t2 against ESG capital (sub-item "E"). Only at this point in time the sequestration performance is available (to the general public) as a contribution to climate change mitigation ("operational readiness").

- Derecognition 2

Cash affecting profit or loss is recorded in F bookkeeping in connection with the ESG matter. In ESG bookkeeping, the income account posted in F bookkeeping is reversed at this time with the derecognition of the ESG matter.

Example: Company B sells a CO₂ sequestration certificate for the asset recorded in ESG bookkeeping for CO₂ sequestration. The cash payment received was recorded as revenue in F bookkeeping. In ESG bookkeeping, the income account posted in F bookkeeping is reversed when the asset is derecognised.

SPA 2 Reporting in ESG bookkeeping

To properly recognise ESG matters at account level, the F individual chart of accounts must be expanded to include Environmental, Social and Governance matters. It is proposed that new balance sheet sub-items be recognised for ESG assets and liabilities. Specifically, for example, the DATEV standards charts of accounts (SKR 04)⁴⁹ could be expanded in the following places:⁵⁰

- Balance sheet
 - Assets: sustainable assets

⁴⁹ DATEV is a well-known German technical information services provider for tax, accountancy and attorneys. The "SKR 04" is a German standard chart of accounts for companies subject to disclosure requirements and could be downloaded here: <https://www.datev.de/web/de/datev-shop/material/skr-04-englisch/>

⁵⁰ Following Lay-Kumar et al., loc. cit. (fn. 19), p. 56 ff. As part of the QuartaVista project, a prototype of such a standard chart of accounts extended to include ESG accounts was developed together with SAP.

In the system proposed here, only the sustainability issues recorded in ESG bookkeeping (in addition to F bookkeeping) are recorded separately according to E, S and G. In principle, it is conceivable that the sustainability issues already recognised in F bookkeeping could also be recorded in separate E, S and G sub-accounts, although this would result in a more extensive revision of the standard chart of accounts.

- Balance sheet
 - Assets: sustainable assets
0191/2/3 sustainable assets: E/S/G
 - Liabilities: ESG capital
2941/2/ 3 ESG capital for sustainability: E/S/G
 - Liabilities: provisions for sustainability
3066/7/8 provisions for sustainability: E/S/G
- P&L
 - Incomes: incomes from sustainability
4826/7/8 incomes from sustainability: E/S/G
 - Expenses: expenses from sustainability
6851/2/3 expenses from sustainability: E/S/G

SPA 3 Measurement in ESG bookkeeping

SPA 3a Determination and interpretation of indicators

The measurement of ESG issues is of central importance. Ultimately, no entry is possible without measurement. And a typical feature of ESG issues is that there are usually no values from (active) markets and often no (generally recognised) procedures have yet been established for measurement.

To assess ESG issues, the indicators relevant to the measurement must first be determined and interpreted. SPA considers three levels of indicators, which are considered equally (if data is available).⁵¹

Level 1: scientific and political target values (e.g. planetary boundaries,⁵² Paris Agreement)

Level 2: empirical comparative values (best-in-class approach)⁵³

Level 3: subjective assessment of the company based on practical knowledge. This is not necessarily intended to be the assessment of the management alone, but of all stakeholders in the company.⁵⁴

The measurement is based on the traffic light principle: a measurement in the green area corresponds to a value contribution to sustainable management (positive external effect). The yellow area does not contain material positive and/or negative value contributions and is therefore not taken into account further for ESG bookkeeping. The red area shows a negative measurement (negative external effect) due to risky behaviour regarding the respective ESG criterion.

⁵¹ Cf. Lay-Kumar, Jenny; Final report QuartaVista, report section Regionalwert AG Freiburg. 2021 (www.quartavista.de; accessed: 04/04/2022), p. 26 ff.

⁵² The planetary boundaries are an internationally recognised framework of the Stockholm Resilience Center which define the safe operating space for humanity and thus for economic activity, and which quantify the risky area. Johan Rockström et al (2021): *Breaking Boundaries: The Science Behind our Planet*. Dorling Kindersley, London 2021.

⁵³ In the interests of comparability, standardised sector-specific data should be used as far as possible for the measurement. In this respect, this should be specified centrally by one or more “public” bodies. For example, analogous to the central specification in Germany of the discount rates required for the HGB provision calculation by the German Central Bank (Deutsche Bundesbank).

⁵⁴ The inclusion of subjective empirical knowledge only makes sense if the company undertakes a (self-)critical assessment of its own ESG performance. The aim here is by no means to open the door to greenwashing, but rather to utilise the opportunity to incorporate valuable practical knowledge. Experience from the research projects “Richtig rechnen in der Landwirtschaft I + II” and “QuartaVista” shows that companies do critically assess their own (positive or negative) contribution to the common good. Cf. Lay-Kumar et al. 2021, op. cit. (fn. 19).

For the E sub-topic of “climate change mitigation” (ESRS E1, climate change), which is primarily dealt with in this article, the determination of the indicator is obvious; it is the amount of CO₂ eq./t per year. When determining the indicators for the Social sub-topic “health and safety” (ESRS S1, own workforce), it is also obvious that the sickness rate (proportion of sick days to target working days) is used to determine sickness costs. However, it is more difficult with other ESG topics, such as determining an indicator for the E sub-topic “impacts on the state of species” (ESRS E4, biodiversity and ecosystems). Once the indicator(s) has/have been determined, they must be interpreted in terms of the threshold values above which external positive or negative external effects exist.

In the context of increasingly drastic anthropogenic climate change, any emissions of CO₂ have a negative external effect. Negative emissions, e.g. through CO₂ sequestration, on the other hand, give rise to positive external effects. Against the background of the Paris Agreement, the EU Green Deal and the German Federal Climate Change Act, a limit of 0 tonnes of CO₂ is set.⁵⁵ The indicator is determined and interpreted here exclusively at level 1, i.e. every tonne of CO₂ that is emitted is interpreted as a material negative impact on the climate for which a CO₂ provision must be set in ESG bookkeeping.⁵⁶ The basis for such CO₂ provisioning is the assumption that future voluntary or mandatory cash compensation payments will occur for CO₂ emitted in the past (e.g. through climate lawsuits).⁵⁷ As soon as the cash outflow becomes probable,⁵⁸ the provision must be recognised in F accounting and derecognised from ESG accounting. Such a transfer would be Sustainability performance neutral. Accordingly, every tonne of CO₂ that is sequestered is interpreted as a positive material impact on the climate for which an asset is recognised in ESG bookkeeping.

The CO₂ volume - assuming that this is material - is already the subject of ESRS reporting (ESRS E1-6 and ESRS E1-7).

SPA 3b monetisation

In a further step, the indicator(s) that generate(s) relevant positive or negative external effects must be monetised.⁵⁹ Based on HGB and IFRS accounting, the initial measurement of assets is carried out at acquisition costs or costs of production.⁶⁰ The provisions are to be valued at the probable amount for fulfilment.⁶¹

⁵⁵ This is one of several conceivable interpretations of the CO₂ indicator. For other valuation and monetisation approaches, see footnote 63.

⁵⁶ In this case, there is no yellow area; the traffic light consists only of a green and a red area.

⁵⁷ By analogy with the recognition of goodwill, which is based on a maximum useful life of 10 years (German HGB balance sheet) or 15 years (German tax balance sheet), it would be conceivable to derecognise a CO₂ provision from ESG accounting after 20 years, for example.

⁵⁸ Even though there are no legally binding climate lawsuits against German companies as yet, experts assume that climate lawsuits will increase and that companies can be held liable for climate damage in the future. The German legal system has many dynamic elements. There are open legal concepts and changing public opinion, which is becoming more climate sensitive. Even if no lawsuits have been successful today, this may change in the future Cf. Wrede Insa; Klimaklagen: Unternehmen vor Klagewelle? Deutsche Welle (DW), 1 March 2023 (www.dw.com/de/mehr-klimaklagen-gegen-unternehmen/a-64830154; accessed: 19 March 2023). Only when there are no more claims for damages are the provisions against the ESG capital to be derecognised. In principle, other interpretations and thus limit values are also conceivable. According to ESRS E1-4, companies must specify concrete, absolute targets in connection with climate change mitigation and adaptation (ESRS E1.AR 31). This also includes specific CO₂ reduction targets.

⁵⁹ In principle, it should be easier to monetise issues of “financial materiality” than those of “materiality of impact”, as estimates of the impact on the company’s cash flows are necessarily available for the former.

⁶⁰ § Section 253 (1) sentence 1, 1st HS HGB and IFRS property, plant and equipment IAS 16.15 and IAS 38.18 (2). As there is typically not (yet) a market for the ESG issues discussed here, the costs of production are generally used.

⁶¹ According to the German Commercial Code (HGB), at the settlement amount required according to prudent business judgement (Section 253 (1) sentence 2 HGB. IFRS provisions are to be measured at the best estimate of the expenditure required to settle the

The recognition of positive external effects as an asset in ESG bookkeeping will mainly relate to internally generated assets, such as CO₂ sequestration. In these cases, the initial measurement is carried out at the cost of production, which is verified by documenting the expenses recognised in F bookkeeping.⁶²

For the monetisation of CO₂ provisions, the current CO₂ exchange price of the European CO₂ emissions trading system (EU ETS) is used here, as this is taken as the settlement amount for the provision.⁶³ This is because the CO₂ provision could be settled and derecognised through the purchase of CO₂ emission rights. The consideration of transition budgets is conceivable for the initial provision measurement.

The five Environmental ESRS standards each provide for disclosure requirements on the anticipated financial effects of the topics relevant to the respective ESRS standard.⁶⁴ The measurement for ESG bookkeeping and the disclosure requirements for expected financial ESG impacts should be harmonised.

- Initial measurement 1

Initial measurement of an ESG provision with the settlement amount (see also “Recognition 1”).

*Example: Recording of a CO₂ provision in the ESG bookkeeping of company B with the settlement amount of €24 million (400,000 tonnes of CO₂ * €60/t CO₂). It is assumed that the exchange price (EU ETS) at inception of €60/t CO₂ is used as the settlement amount.*

Entry formula (t1)

Serial No.	Accounting	Debit Account No.	Debit Account Name	Debit Amount	Credit Account No.	Credit Account Name	Credit Amount
(1)	ESG = S	6851	expenses for CO ₂ emissions	€24 mill.	3066	provisions for CO ₂ emissions	€24 mill.

- Initial measurement 2

Initial measurement of an ESG asset with the acquisition costs or costs of production (see also “Recognition 2”).

*Example: An expense for CO₂ sequestration posted in the F bookkeeping of company B for the amount of the costs of production of €2 million (50,000 tonnes of CO₂ * €40/t CO₂) leads to the recognition of a sustainable asset in ESG bookkeeping.*

present obligation at the balance sheet date (IAS 37.36).

⁶² In principle, the contribution to the common good, in this example the climate protection performance, could also be valued higher or lower than the costs of production. In line with HGB/IFRS, the costs of production are used here.

⁶³ Depending on the stakeholder group, the value approach for monetisation can be viewed differently. For example, the German Federal Environment Agency (Umweltbundesamt) calculates the climate costs at €238/t CO₂ for 2022 at a 1%-time preference rate (www.umweltbundesamt.de/daten/umwelt-wirtschaft/gesellschaftliche-kosten-von-umweltbelastungen#klimakosten-von-treibhausgas-emissionen; accessed: 08/08/2023). Since 1 January 2021, oil and petrol have been subject to a CO₂ tax in Germany on the basis of the Fuel Emissions Trading Act (Brennstoffemissionshandelsgesetzes BEHG). In 2023, this tax will amount to €30/t CO₂ and is set to rise to €55/t CO₂ by 2025. The CO₂ exchange price (EU ETS) rose from an average of around €0.70/t CO₂ in 2007 to an average of around €81/t CO₂ in 2022 (www.statista.com/statistik/daten/studie/1304069/umfrage/preisentwicklung-von-co2-emissionsrechten-in-eu/; accessed: 08/08/2023). In his concept of “social-ecological accounting”, Günsoy proposes sector-specific tax exempt amounts for monetisation for accounting tax purposes, cf. Lay-Kumar/Henkel (2023), loc. cit. (fn. 18).

⁶⁴ See ESRS E1-9, ESRS E2-6, ESRS E3-5, ESRS E4-6 and ESRS E5-6.

Entry formula (t1)⁶⁵

Serial No.	Accounting	Debit Account No.	Debit Account Name	Debit Amount	Credit Account No.	Credit Account Name	Credit Amount
(2)	ESG	0191	asset from CO ₂ sequestration	€2 mill.	6990	cost of sales	€2 mill.
(2a)	F	6990	cost of sales	€2 mill.	1800	Bank	€2 mill.
Σ	S	0191	asset from CO ₂ sequestration	€2 mill.	1800	Bank	€2 mill.

The subject of the subsequent measurement of assets under HGB and IFRS are the costs amortised by scheduled and/or unscheduled depreciations;⁶⁶ the amortised (acquisition or production) costs.⁶⁷ However, this assumes that the assets are utilised by the company and remain on the company's balance sheet.⁶⁸ As ESG assets are only recognised if they have a material positive external ESG effect for the common good⁶⁹, they are derecognised against ESG capital at the point when they are made available for use by the general public. In this respect, there is no subsequent measurement for the ESG assets considered in this article, only derecognition against ESG capital. As part of the subsequent measurement of provisions, the settlement amount must be checked to ensure that it is up to date.⁷⁰

- Subsequent measurement 1

For the provisions carried in ESG bookkeeping as a CO₂ provision, the settlement amount may need to be updated.

*Example: The CO₂ provision of company B has been recognised in ESG bookkeeping with the CO₂ exchange price (EU-ETS) of €60/t CO₂ as the settlement amount posted at inception. The exchange price has risen to €70/t CO₂ as at the reporting date. The settlement amount was updated accordingly, and the provision increased by €4 million (400,000 tonnes of CO₂ * (70 - 60 €/t CO₂)) recognised as an expense (write-up).*

Entry formula (t2)

Serial No.	Accounting	Debit Account No.	Debit Account Name	Debit Amount	Credit Account No.	Credit Account Name	Credit Amount
(3)	ESG = S	6851	expenses for CO ₂ emissions	€4 mill.	3066	provisions for CO ₂ emissions	€4 mill.

- Subsequent measurement 2

The ESG assets recognised in ESG bookkeeping will generally be internally generated ESG items that were entered as assets with costs of production. After completion, these are made available to the general public and derecognised, so that there is no subsequent measurement (at amortised costs of production) in the

⁶⁵ According to the cost of sales method.

⁶⁶ For scheduled depreciation, see section 253 para. 3 sentence 1 HGB and for IFRS property, plant and equipment in the cost model IFRS 16.30 and IFRS 38.74. Unscheduled depreciations are to be recognised in accordance with section 253 para. 3 sentence 3 HGB and section 253 para. 4 sentence 1 HGB and for IFRS property, plant and equipment in accordance with IFRS 36.

⁶⁷ For property, plant and equipment (IAS 16, IAS 38), there is also the option of fair value measurement through other comprehensive income (OCI). For reasons of simplification, this alternative is not discussed.

⁶⁸ This is the case for the operational ESG issues not discussed here.

⁶⁹ See footnote 36.

⁷⁰ With regard to subsequent valuation for provisions, see section 253 (1) sentence 2, 2nd HS HGB and IAS 37.36.

company's balance sheet.⁷¹

*Example: The expense for CO₂ sequestration recorded in F bookkeeping for company B for the costs of production of €2 million (50 thousand tonnes of CO₂ * €40/t CO₂) leads to the recognition of a sustainable asset in ESG bookkeeping (see "initial measurement 2"). These costs of production remain unchanged and are to be derecognised upon derecognition.*

Entry formula (t2)

None.

The special feature of ESG items recorded in ESG bookkeeping is that they are not necessarily subject to payments and are therefore not necessarily derecognised. If cash nevertheless flows for ESG bookkeeping items, this is recorded in F bookkeeping as affecting profit or loss. In a second step, the carrying amount of the ESG asset or the ESG provision affecting profit or loss is then derecognised in ESG bookkeeping. This could be the case if money is received for CO₂ sequestration performances as part of a humus certificate, for example. Or if money is voluntarily paid for CO₂ emissions that are not covered by CO₂ emissions trading as part of CO₂ offsetting programmes.

However, for ESG items recognised in ESG bookkeeping it is probably rather typical that there is no cash flow. In this case, a different pathway has to be taken: A disposal transaction must be simulated at the derecognition time ("operational readiness" of the asset or when the reason for recording provisions no longer applies) so that derecognition occurs. The fair value (HGB⁷², IFRS⁷³) is used as a surrogate for the missing disposal value in the case of SPA.⁷⁴

- Derecognition measurement 1

If there is no cash flow for ESG items recognised in ESG bookkeeping, a disposal transaction must be simulated at the derecognition time in order for derecognition to occur. The fair value is used as a surrogate for the missing transaction price. The ESG asset or ESG provision is derecognised against ESG capital. This means that derecognition does not affect profit or loss unless the derecognition amount differs from the final carrying amount of the asset or provision.

Example 1a: The recognised CO₂ provision totalling €28 million in the ESG bookkeeping for company B with the settlement amount (last exchange price) of €70/t CO₂ is derecognised at the unchanged fair value

⁷¹ The asset recognised by the company would have to be capitalised in an imaginary balance sheet for the general public and then depreciated there on a scheduled and/or unscheduled basis.

⁷² The fair value corresponds to the market price (e.g. exchange price) of an active market. If there is no active market, the fair value must be determined using recognised valuation methods. Input parameters observable on the market must be used. If the fair value cannot be determined either by a market price on an active market or by a recognised valuation method, the acquisition costs or costs of production must be used (Section 255 (4) HGB).

⁷³ Fair value under IFRS is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date (IFRS 13.9). According to IFRS 13.24, the fair value is the price at which an asset would be sold, or a liability transferred in an orderly transaction in the principal or most advantageous market at the measurement date under current market conditions, i.e. it is a disposal price. When measuring the fair value for non-financial instruments, which is relevant for this article, the "highest and best use" is always assumed for the price measurement, i.e. it must be assessed from the perspective of the market participant whether own use or sale leads to the highest and best use (IFRS 13.27 ff.). This means that if own use by the market participant leads to the best use, then no sale transaction should be fictitious. However, if, as in the present case, the highest and best use is for the common good, then the transaction price would be the correct value.

⁷⁴ In analogy to IFRS 9.B5.1.1, where the transaction price is stated as the best approximation for the fair value.

of €70/t CO₂ against the ESG capital within ESG bookkeeping with no impact on profit or loss. There is no profit or loss on disposal in ESG P&L, so that SEBIT, for example, remains unaffected by this situation.

Entry formula 1a (t2)

Serial No.	Accounting	Debit Account No.	Debit Account Name	Debit Amount	Credit Account No.	Credit Account Name	Credit Amount
(4)	ESG = S	3066	provisions for CO ₂ emissions	€28 mill.	2941	ESG capital	€28 mill.

Example 1b: The asset recognised for CO₂ sequestration in the ESG bookkeeping for company B in the amount of €2 million with costs of production of €50/t CO₂ is derecognised at a fair value of €70/t CO₂ and a total value of €3.5 million against the ESG capital. The difference results in a derecognition profit of €1.5 million in the ESG P&L and therefore also in SEBIT.

Entry formula 1b (t2)

Serial No.	Accounting	Debit Account No.	Debit Account Name	Debit Amount	Credit Account No.	Credit Account Name	Credit Amount
(5)	ESG = S	2941	ESG capital	€3.5 mill.	0191	asset from CO ₂ sequestration	€2 mill.
					4830	Other operating income	€1.5 mill.

(1) Derecognition measurement 2

If cash does flow for ESG bookkeeping entries, this is initially recorded in F bookkeeping as affecting profit or loss. In a second step, the carrying amount of the ESG asset or ESG provision affecting profit or loss is derecognised in ESG bookkeeping. This means that the derecognition does generally not affect profit or loss at the S P&L level unless the cash amount differs from the last carrying amount of the asset or provision.

*Example 2a: For the most recent CO₂ provision recognised with a fulfilment amount (last exchange price) of €70/t CO₂, Company B pays exactly €70/t CO₂ as part of a CO₂ offsetting programme. The cash payment of €28 million (400,000 tonnes of CO₂ * €70/t CO₂) is recorded as an affecting loss in F bookkeeping. In ESG bookkeeping, the CO₂ provision affecting profit is reversed. In this case, there is no profit or loss on derecognition so that S bookkeeping and thus also SEBIT, for example, remain unaffected by this situation.*

Entry formula 2a (t2)

Serial No.	Accounting	Debit Account No.	Debit Account Name	Debit Amount	Credit Account No.	Credit Account Name	Credit Amount
(6)	ESG	3066	provisions for CO ₂ emissions	€28 mill.	6300	Other operating expenses	€28 mill.
(6a)	F	6300	Other operating expenses	€28 mill.	1800	Bank	€28 mill.
Σ	S	3066	provisions for CO ₂ emissions	€28 mill.	1800	Bank	€28 mill.

*Example 2b: Company B receives a payment of €70/t CO₂ for CO₂ sequestration as part of a CO₂ sequestration certificate. This transaction price corresponds to the fair value at the derecognition time. The payment received of €3.5 million (50,000 tonnes of CO₂ * €70/t CO₂) is recognised as affecting profit in F*

bookkeeping. In ESG bookkeeping, the asset - at €50/t CO₂—is derecognised as an amount of €2 million affecting loss. The difference of €1.5 million (€3.5 million-€2 million) results in a profit of derecognition in S bookkeeping and also in SEBIT, for example.

Entry formula 2b (t2)

Serial No.	Accounting	Debit Account No.	Debit Account Name	Debit Amount	Credit Account No.	Credit Account Name	Credit Amount
(7)	ESG	4830	Other operating income	€2 mill.	0191	asset from CO ₂ sequestration	€2 mill.
(7a)	F	1800	Bank	€3.5 mill.	4830	Other operating income	€3.5 mill.
Σ	S	1800	Bank	€3.5 mill.	0191	asset from CO ₂ sequestration	€2 mill.
					4830	Other operating income	€1.5 mill.

Solution to numerical example

For the year 01, Company B recognises a total amount of -€28 million (€24 million + €4 million) for the CO₂ provision in the ESG and therefore also S P&L; see entry formulae (1) and (3). A total amount of €3.5 million affecting profit or loss is recognised for the sequestration performance; see entry formulae (2) and (7).

Accordingly, the equity sub-item annual profit/loss in the ESG and S balance sheet at the end of year 01 (t2) decreases *ceteris paribus* by -€24.5 million (-€28 million + €3.5 million). As the CO₂ sequestration asset has performed its sequestration performance ("operational readiness") at the end of the year and company B has not received any cash payment for this, the asset is derecognised against ESG capital; see bookkeeping entry (7). As company B has made a free contribution in kind to the general public, the ESG capital at t2 shows a balance of -€3.5 million. In contrast, the CO₂ provision remains in place at the end of the year and is not yet derecognised against ESG capital, as it could still be legally sued for the environmental pollution and therefore the reason for the provision creation has not yet ceased to exist.

Sustainable performance

Sustainable performance (S performance) can then be determined based on ESG bookkeeping and explained in comparison to F performance (SPA 4).

SPA 4a Determination of S performance

The addition of the carrying amounts from F and ESG bookkeeping results in the carrying amounts of holistic S bookkeeping. The S balance sheet and S P&L can then be created from this. The latter in turn forms the basis for the calculation of all earnings-related holistic S performance indicators, such as SP&L, SEBIT and SROE.

SPA 4b Explanation of S performance

There will be a difference between F and S performance, e.g. EBIT and SEBIT. This must be explained as part of a reconciliation. This could be shown, for example, by expanding the overview of the specific ESG reporting topics - from the result of the double materiality analysis.⁷⁵ Such a transition from F to S performance

⁷⁵ The result of the materiality assessment must also be disclosed in accordance with the provisions of ESRS 2 SBM-3 (Material impacts, risks and opportunities and their interaction with strategy and business model) and ESRS 2 IRO-2 (Disclosure requirements in ESRS covered by the undertaking's sustainability statement). Cf. EFRAG, loc. cit. (fn. 41), para. 44, p. 13.

could, for example, be located in chapter “1. General Information”⁷⁶ of the sustainability report - which in turn forms part of the management report. It is also conceivable that the S balance sheet and S P&L could also be published here.

Further continuation of the numerical example

The subject of the left part of Figure 2 is the result of the double materiality analysis of Company B. In addition to the two ESRS E1 issues already known from the previous chapter (CO₂ emissions from production, CO₂ sequestration), the example has been expanded as follows. For Company B, three ESRS S1 issues (wage spread, employee health, apprentices)⁷⁷ and two ESRS G1 issues (bribery, resilience) are material. This means that a total of 7 ESG topics are material for Company B.

Figure 2 indicates for each ESG topic whether it has a positive or negative impact. In addition, the degree of severity⁷⁸ of each ESG issue is shown graphically with regard to the impact materiality (inside-out) and/or the financial materiality (outside-in).

The reconciliation to SEBIT could be based on this presentation of the results of the double materiality analysis. For each ESG issue, the bookkeeping amount could be added to the ESG P&L along with the reference to the corresponding page of the sustainability report, in which the respective ESG issue, particularly the measurement, is explained.

This value is also the subject of the red-framed field at the top right of Figure 2. For “positive” ESG issues, revenue (from the recognition of an asset in the ESG balance sheet) is shown in the ESG P&L. In the specific example, this relates to CO₂ sequestration (+ €3.5 million), employee health (+ €4 million) and apprentices (€1 million). Accordingly, an expense must be recognised in ESG P&L for “negative” ESG entries, as these are to be carried as a liability in the ESG balance sheet. On the one hand, this relates to CO₂ emissions from production (-€28 million) and negative effects from bribery (-€3 million). It was not possible to measure two other “negative” ESG issues, meaning that no ESG entry was possible here (wage spread, resilience).

⁷⁶ Cf. ESRS 1 Appendix F “Example of structure of ESRS sustainability statement”.

⁷⁷ The issues of wage spread, employee health and apprentices were operationalised in the QuartaVista innovation project and presented using fact sheets. Cf. Lay-Kumar et al. 2021, loc. cit. (fn. 19).

⁷⁸ According to ESRS 1AR10, the severity measure results from the following three characteristics: scale, scope and irremediable character.

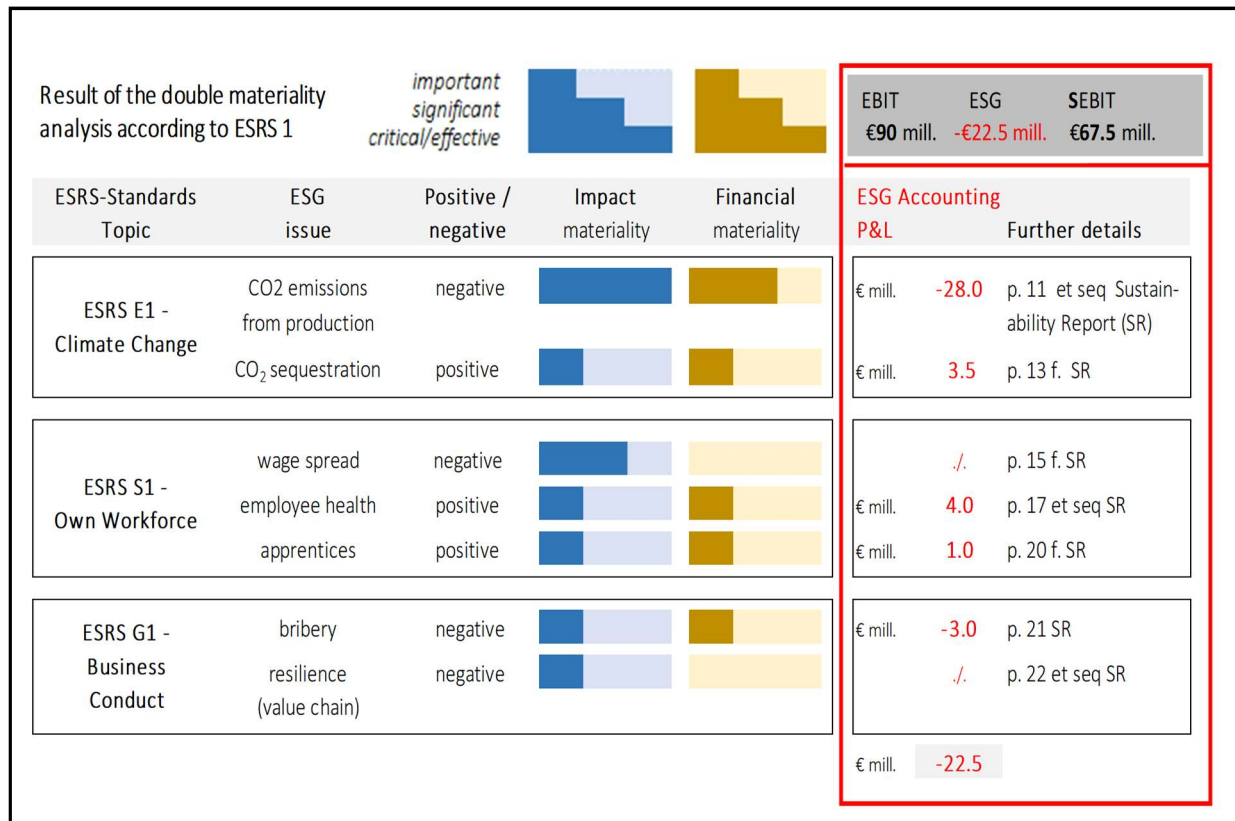


Figure 2. Reconciliation of EBIT to SEBIT.⁷⁹

In total, this results in an additional burden from the ESG P&L of -€22.5 million. This figure is also shown in the top right-hand corner of the red-framed box in Figure 2. Based on Company B's EBIT of €90 million, subtracting -€22.5 million from ESG P&L results in SEBIT of €67.5 million. The reconciliation shows whether each individual ESG item was recorded in ESG bookkeeping and, if so, the amount. In addition, the page references from the sustainability report are shown which list details—such as influencing factors used in the measurement, threshold values and monetisation.

Conclusion and Outlook

Sustainable Performance Accounting shows how ESG issues can be integrated into real performance indicator by means of means understanding them as pre-financial issues and recording them in ESG bookkeeping. In the authors' opinion, stakeholders need a few established performance indicators for initial orientation, especially for complex and interdisciplinary integrated financial and sustainability reporting. The Sustainability performance indicators outlined in this article, such as SEBIT, are suitable for this purpose. The SPA methodology includes a "sustainability memory" in the form of ESG capital, as all ESG issues from recent years are recorded and reported in aggregated form at a central point in the balance sheet. As the three sub-areas of sustainability (E, S and G) are recognised in separate ESG capital sub-accounts, the origin of the ESG capital can be traced transparently.

⁷⁹ Own presentation, based on Kaefer SE & Co KG, Impact and material topic overview, Sustainability & ESG Report 2022, p. 23.

If the basic idea of SPA were to be implemented in German national legislation,⁸⁰ the reporting of S performance indicators could be included in the German Commercial Code (HGB) over and above the national CSRD implementation—for example in an option.⁸¹ The existing paragraphs on the management report in Sections 289b to 289e HGB, which currently contain the content of the non-financial statement, would have to be revised as part of the ratification of the CSRD into German law. Such an option could be anchored in the management report regulations.⁸² The same would apply to the HGB-consolidated non-financial statement (Section 315c HGB) and IFRS-consolidated non-financial statement (Section 315e HGB). In addition, German Accounting Standard (GAS) 20 “consolidated management report” also contains a passage on the “consolidated non-financial statement”, which would also have to be revised as part of the ratification of the CSRD into German law. GAS 20 also contains a passage on non-financial performance indicators. In this respect, more detailed descriptions of SPA reporting in GAS 20 would be conceivable in principle. However, it should be noted that such a passage in a GAS would only be directly relevant for groups subject to CSRD.

The long-term goal must be that parallel F and ESG bookkeeping is no longer required because all ESG issues are subject to regular F bookkeeping and F accounting. The more ESG matters are regulated⁸³ and/or the recognition criteria for F accounting is expanded⁸⁴, the more this will become reality. However, the basic prerequisite for regulation, e.g. in the form of ESG taxation and/or ESG transfer payments, is the pricing of ESG issues, as has already been determined by the German Regionalwert (sustainability) performance calculation for almost five hundred ESG performance indicators in agriculture and forestry.⁸⁵ And ESG bookkeeping provides valuable data material for this.

Until this is the case, ESG bookkeeping is needed to determine S performance indicators. In this context, however, it should also be noted that there are still no (generally recognised) measurement methods for various sustainability issues, as (standardised) indicators, threshold values and/or monetisation are still to be developed.

⁸⁰ Cf. Coalition Agreement 2021-2025; cf. SPD, Alliance 90/The Greens, FDP, loc. cit. (fn. 17), p. 170 f.

⁸¹ In principle, a reporting obligation would also be conceivable. However, as the companies concerned will be busy with the initial implementation of the pure CSRD requirements, this additional national requirement should initially be voluntary. If stakeholders see added value in the reporting of S performance indicators, such additional information will also be reported voluntarily.

⁸² In principle, it would also be possible to authorise the ESG entries in the HGB annual financial statements (F accounting) themselves, for example. However, the prerequisite for this is that this is compatible with the content of the EU Accounting Directive. In this case, however, not only the information function but also the tax measurement and distribution of profits measurement function of the annual financial statements would be affected. Corresponding consequential amendments would entail more extensive changes to the existing legal provisions other than mere presentation in the context of management reporting.

⁸³ Regulation enables, among other things, the creation of a market—and therefore also a market price - for ESG issues. This would then also fulfil the recognition criteria, as an inflow or outflow of cash would then be likely.

On 18 December 2022, for example, it was decided to extend European emissions trading to almost all sectors, particularly buildings and transport. Around 85 per cent of all European CO₂ emissions will therefore be linked to certificates or emission allowances in future. The quantity of these will decrease continuously—in line with the European climate targets. These issues will then be the direct subject of F bookkeeping and F accounting and would no longer need to be included in ESG bookkeeping. Cf. German Federal Ministry for Economic Affairs and Climate Protection, press release - European Parliament confirms agreement on the reform of EU emissions trading, 18 April 2023 (www.bmwi.de/Redaktion/DE/Pressemitteilungen/2023/04/230418-europaisches-parlament-bestatigt-einigung-zur-reform-des-eu-emissionshandel.html; accessed: 19 March 2023).

⁸⁴ EFRAG presented various extended recognition definitions of intangible assets for discussion. Cf. EFRAG, Better Information on Intangibles—Which is the best way to go? 27.04.2023, Recommendations and Feedback, 27.04.2023 (www.efrag.org/News/Project-641/EFRAgs-Recommendations-and-Feedback-Statement-on-Better-Information-on-Intangibles-; accessed: 10.08.2023).

⁸⁵ For examples of the numerous research projects on regional value performance accounting, cf. www.regionalwert-research.de/laufende-projekte/pilotprojekt-in-niedersachsen/; www.regionalwert-leistungen.de/blog/2022/03/nachhaltigkeit-honorieren-die-zukunft-des-oekolandbaus/; Röttig, Bettina: Wahre Preise: Jetzt wird neu abgerechnet. Lebensmittel Praxis (www.lebensmittelp Praxis.de/sortiment/38123-regionalwert-leistungsrechnung-jetzt-wird-neu-abgerechnet.html, accessed: 12 October 2023).

However, this is a prerequisite for inclusion in ESG bookkeeping and thus ultimately inclusion in S performance indicators. Further research contributions⁸⁶ and critical discussions are needed here - and already exist. Details are to be worked out in further publications. And until then, the authors believe that it is better to use imperfect standards for the internalisation of external effects in ESG bookkeeping than not to carry out any measurement and bookkeeping entry at all.⁸⁷

A comprehensive S performance can hardly be determined at the first attempt. A pragmatic approach would therefore be to start with the ESG areas that are most pressing and where measurement is easiest. These are likely to be most of the (sub-) subthemes of ESRS E1 (climate change) and ESRS S1 (own workforce). Measurement discretions should be presented transparently through disclosure, as is the case in some areas of F bookkeeping. Even in traditional accounting in accordance with HGB and IFRS, the measurements are not always unambiguous. There are also discretions - some of them not insignificant - in the measurement of certain accounting items.⁸⁸

Even if the S performance indicator provides stakeholders with a good starting point for a holistic analysis of integrated financial and sustainability reporting, it can be assumed that individual stakeholders themselves determine the value approaches relevant for their own analysis purposes. Transparency and disclosure of the parameters used to determine the S performance indicator(s) is important for this. However, it must also be taken into account that the structure of a company's accounting system, in particular the internally orientated parts—such as ESG bookkeeping—is a reflection of the corporate target system. Without the objective of internalising positive and negative external effects of sustainability in the bookkeeping in order to gain an integrated perspective on corporate success, a rational, traditional accounting system will not “produce” such ESG data.⁸⁹

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⁸⁶ Project 37679/01 of the German Federal Environmental Foundation (BDU) is mentioned here as an example: “Standardisation of the recording of sustainability indicators for agricultural businesses” (www.dbu.de/projektdatenbank/37679-01/; accessed 09/09/2023).

⁸⁷ Analogue Rochol, Besser unvollkommene Biodiversitätsmaßstäbe als Untätigkeit, Tagesspiegel Background Sustainable Finance Commentary, 13.07.2023 (<https://background.tagesspiegel.de/sustainable-finance/besser-unvollkommene-biodiversitaetsmassstaebe-als-untaetigkeit>; accessed: 10.08.2023).

⁸⁸ Examples include the valuation of financial instruments on inactive markets. Or the determination of the probable amount for fulfilment of provisions.

⁸⁹ Cf. Schreiner, Manfred, op. cit. (fn. 11), p. 252.



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