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Economic Aspects of the Reporting of Taxonomic Indicators and Greenhouse Gas Emissions in the Czech Construction Industry

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ABSTRACT

This study examines the economic impact of taxonomic indicator reporting and greenhouse gas (GHG) emission disclosures by leading construction companies in the Czech Republic. As environmental, social, and governance (ESG) criteria grow in importance, transparent sustainability reporting has become a key factor influencing financial stability, investment attractiveness, and regulatory compliance. Using qualitative content analysis of company reports, the study reveals significant disparities between subsidiaries of international construction firms and Czech-owned companies. While the former align with global frameworks such as the Global Reporting Initiative (GRI) and the Greenhouse Gas Protocol, the latter lag in ESG adoption, exposing them to financial and competitive risks. The findings highlight the economic benefits of standardized ESG reporting, identify gaps in local practices, and provide actionable recommendations—including adopting international frameworks, investing in sustainability training, and leveraging government incentives. Additionally, the study supports regulatory preparedness for upcoming EU requirements. These insights contribute to the broader discourse on integrating ESG principles into corporate strategy and financial performance.

1. Introduction

Sustainability reporting has become a key financial and strategic issue for companies, particularly in construction-intensive industries. A critical milestone will be reached in 2026, when all large companies, including unlisted companies, will be required to report sustainability data for the previous financial year (2025) [1]. According to [2], when assessing the overall performance of companies, it is important to consider not only conventional financial metrics but also broader non-financial factors such as environmental sustainability, governance practices, and corporate social responsibility. The aim is to achieve a balance between the needs of the business and the interests of its stakeholders, which should contribute to the long-term sustainability and social responsibility

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of the organization [3]. Various stakeholders are closely monitoring how Czech companies are adapting to the evolving ESG landscape, including investors focused on responsible capital allocation and regulators emphasizing transparency and accountability [4].

Beyond regulatory compliance, integrating taxonomic indicators and GHG emissions disclosures into financial reporting has significant implications for capital allocation, cost optimization, and business valuation. Research shows that transparent ESG disclosure helps companies obtain better financing, reduce the risk of regulatory penalties, and improve long-term sustainability.

Despite these financial implications, a significant gap exists in the adoption of comprehensive ESG reporting in the Czech construction sector. Existing studies have mainly focused on environmental and regulatory aspects, with limited attention to the economic consequences of ESG integration. This research aims to fill this gap by examining two key financial dimensions:

(1) To what extent do the most important Czech construction companies measure taxonomic indicators such as revenue, capital expenditure (CapEx), and operating expenditure (OpEx) in line with EU regulations, and how does this affect their financial performance?

(2) Whether or not these companies disclose this data along with greenhouse gas (GHG) emissions. Understanding the disclosure practices in this area will shed light on the current state of ESG transparency in the Czech construction sector and identify potential gaps in alignment with EU sustainability legislation.

The paper is structured as follows: Section 2 outlines the research methodology, detailing the data sources and analytical approach. Section 3 presents the findings, highlighting the financial and regulatory trends in ESG reporting among major construction companies. Section 4 discusses the implications of these findings, highlighting the economic risks and opportunities associated with ESG compliance. Finally, Section 5 concludes with recommendations for industry stakeholders and policymakers, advocating for greater transparency and financial integration of sustainability indicators.

1.1. Taxonomy

The European Union's taxonomy, the Sustainable Investment Regulation [5], is a system for classifying and standardizing economic activities according to environmental sustainability. Evolving European regulations will require large construction companies to disclose how their operations impact environmental, social, and governance (ESG) factors. The same breakdown into these three areas is reported by [6]. Effective ESG management can minimize the risks associated with harmful environmental impacts, social controversies, and governance issues, which can prevent financial and reputational losses and result in cost savings, increased revenue, and profitability for the company [7]. Companies will also be required to disclose the proportion of their sustainable activities, specifically:

i. The proportion of net revenue (KPI revenue) generated from economic activities classified as environmentally sustainable.
ii. The proportion of capital expenditure (CapEx) allocated to sustainable projects, including those supporting the transition to greener operations.
iii. Percentage of operating expenditure (OpEx) associated with environmentally responsible activities [5].

Clarifying these financial metrics will enable investors to assess better a company's contribution to sustainability and climate goals [8]. These indicators will be included in taxonomy disclosures and integral to corporate ESG reports and financial statements. According to [9], the market perceives companies that act and report responsibly as less risky, which affects the company's financial

performance and the investors' view. The taxonomic criteria represent an important benchmark towards which economic activities should converge in the long term, especially in view of the EU's goal of achieving climate neutrality by 2050 [10]. Taxonomic eligibility of an activity means that the activity meets the conditions of at least one of the six environmental objectives listed in Table 1.

Table 1
The six environmental objectives [5]

No.	Topic
1	Climate change mitigation
2	Climate change adaptation
3	Sustainable use and protection of water and marine resources
4	Moving to circular economies
5	Prevention and reduction of pollution
6	Protection and restoration of biodiversity and ecosystems

The EU taxonomy currently covers about 180 economic activities that can be classified as sustainable [11]. The focus is on areas with the greatest potential to reduce GHG emissions, and the taxonomy covers two-thirds of the most emission-intensive economic activities (e.g., energy, buildings, transport). This list of activities is not exhaustive. Other sectors, such as agriculture or the glass industry, also have significant potential to reduce their carbon footprint, but their inclusion would be much more complex [12].

1.2. Greenhouse gas emissions reporting

According to [13], the most important indicator of a company's environmental footprint is its carbon dioxide emissions and its impact on climate change. Other activities or issues may include pollution, type and energy consumption, waste management, water management, biodiversity, or deforestation [5]. According to the European Commission, the building sector, including its construction, is responsible for 36% of greenhouse gas emissions in the European Union. Together with the energy, transport, and agriculture sectors, the construction sector is a major contributor to global greenhouse gas emissions and has a significant environmental impact [14]. The energy efficiency of existing buildings is very low, and the number of renovations is insufficient, even though renovations represent the largest potential for energy savings in Europe [15]. The production of building materials (such as steel, cement, and other metals) is also a significant source of emissions, as are emissions associated with transporting raw materials, building materials, and waste. Concrete, steel, and burnt bricks have a high energy intensity in production, leading to a large carbon footprint [16]. All sectors, except transport, show a decreasing trend in carbon emissions [17]. Zero energy buildings (nZEBs) are important for sustainability and reducing greenhouse gas emissions. These buildings are designed to minimize energy consumption and achieve near-zero net energy consumption for basic needs. It is estimated that buildings meeting the nZEB standard will account for at least 25% of the building stock in the EU this year [18]. Increased awareness of carbon-related risks is crucial in driving corporate action towards sustainability. As companies become more aware of these risks, they are increasingly motivated to implement proactive strategies to mitigate their environmental impact and ensure long-term resilience [19].

With Europe committed to achieving carbon neutrality by 2050, quantifying greenhouse gas emissions is a key indicator for sustainability reporting. The most widely used global standard for measuring and reporting carbon footprints is The Greenhouse Gas Protocol: A Corporate

Accounting and Reporting Standard [20], which provides detailed step-by-step guidance to companies. Depending on its origin, the GHG Protocol defines three emissions frameworks:

i. Scope 1 - direct GHG emissions from emission sources owned or controlled by the organization,
ii. Scope 2 - indirect GHG emissions from the production of purchased or acquired energy such as electricity, steam, heating and cooling consumed by the business,
iii. Scope 3 - Other relevant indirect GHG emissions generated in the company's value chain. These emissions are divided into 15 categories: upstream emissions, such as purchasing goods and services, employee travel and leased assets, and downstream emissions, such as transporting goods, using and end-of-life products sold, travel, and financial investments [21].

The number of companies required to disclose non-financial information in the Czech Republic will increase from 25 to around 1,500 [22]. The obligation to report on ESG issues from 2026 (or 2028) will have a major impact on listed companies in particular [23]. The results of the analysis [24] reveal both progress and barriers in the implementation of ESG practices among Czech companies. While awareness and commitment to sustainability are increasing, significant barriers remain. However, as the analysis [25] shows, ESG data reporting is becoming a common part of the transparency and communication of construction companies in the Czech Republic. Of the 50 largest construction companies operating in the Czech market, all present their sustainability activities on their websites, and 31 companies (62%) communicate their ESG data through an annual report, a separate sustainability report, or a corporate brochure.

1.3. GRI and TCFD sustainability reporting

The Global Reporting Initiative (GRI) is the world's most widely used sustainability reporting standard. Many organizations use it, which applies to organizations of all sizes and sectors [26]. It includes rules for reporting on environmental, economic, and social aspects [27]. According to the GRI, balance is very important, i.e., a company should present positive facts and negative impacts of its activities [28]. TCFD (Task Force on Climate-related Financial Disclosures) is the international standard for disclosing climate-related risks and opportunities that affect a company's business. It is used by large companies, financial institutions, and investors [29]. The aim of the paper was to determine whether 1) the largest construction companies in the country [30] measure taxonomic indicators (turnover, capital expenditure or CapEx and operating expenditure or OpEx) according to the European Union regulation and 2) they disclose this data together with GHG emissions.

2. Methodology

This study uses qualitative content analysis to examine the sustainability reports and financial information of the 50 largest construction companies operating in the Czech Republic. Data sources include company annual reports, stand-alone sustainability reports, and other publicly available ESG information. The analysis covers the period 2019-2024 to assess the evolution of reporting practices and alignment with the regulatory framework.

Qualitative content analysis is a set of techniques used to analyze textual data and clarify a topic [31]. This method of content analysis is defined by [32] as a systematic technique for the study of texts and recommended by [33] as suitable for document analysis. A similar approach has been used by [34] and [35] to study non-financial reporting in the Czech Republic and other countries. The aim is to identify the most common practices in non-financial reporting. The qualitative content

analysis follows a systematic process to assess companies' compliance with EU taxonomy requirements and greenhouse gas (GHG) reporting standards. Key assessment criteria include:

i. Compliance with the EU Taxonomy: Companies were assessed on the basis of disclosure of taxonomy indicators, specifically the proportion of net income, capital expenditure (CapEx), and operating expenditure (OpEx) related to environmentally sustainable activities. The assessment follows the classification system defined in the EU Taxonomy Regulation.
ii. GHG reporting: The research examines whether companies report Scope 1, 2, and 3 emissions as defined by the GHG Protocol. It also looks at whether companies follow recognized international reporting standards such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD).
iii. Comparative analysis: The study distinguishes between subsidiaries of multinational companies and Czech construction companies to identify differences in reporting practices.
iv. Transparency of disclosure: The research assesses the availability and depth of ESG disclosures and distinguishes between qualitative commitments and quantitative performance indicators.

The methodology provides a comprehensive and systematic examination of sustainability disclosure practices in the Czech construction industry and provides insight into the financial and regulatory challenges faced by companies in the sector.

3. Results

The analysis shows that sustainability reporting is becoming an integral practice among the construction companies studied. These companies increasingly include both financial and non-financial data in their annual reports, sustainability reports, and corporate brochures. The results show significant differences between subsidiaries of multinational companies and Czech companies. While subsidiaries of foreign parent companies systematically report taxonomic indicators and greenhouse gas (GHG) emissions according to the Greenhouse Gas Protocol, many Czech companies are still in the early stages of integrating ESG considerations into their business strategies.

The sustainability reports of multinational subsidiaries tend to follow established frameworks such as the Global Reporting Initiative (GRI), one of the most widely recognized international standards for sustainability disclosure. These companies provide structured, detailed information on their environmental impacts, risk management, and sustainability initiatives, demonstrating compliance with regulatory requirements and investor expectations. In contrast, Czech companies often lack a standardized ESG reporting framework, which could affect their access to sustainable financing and overall market competitiveness. This study highlights the importance of ESG integration in increasing transparency, meeting regulatory requirements, and ensuring financial resilience in the evolving construction industry.

Ten construction companies report their GHG emissions under Scopes 1 and 2, 6, including Scope 3 (Figure 1). All companies are actively seeking to reduce emissions. A key environmental objective is to achieve carbon neutrality.

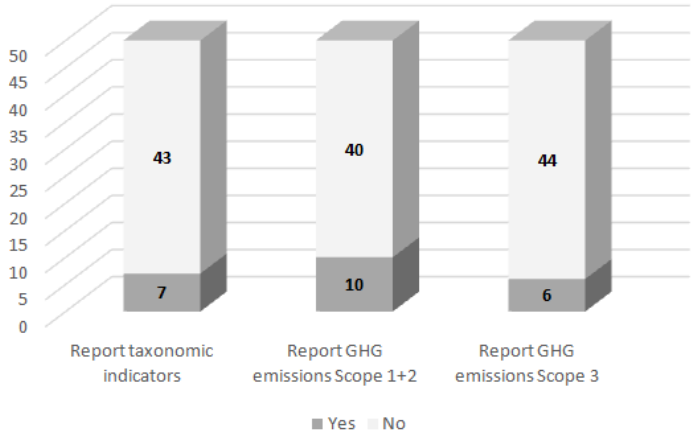

Fig. 1. Overview of Reporting of Taxonomic Indicators and GHG Emissions for Scopes 1, 2 and 3

Seven construction companies actively track taxonomy indicators, including revenue, capital expenditure (CapEx), and operating expenditure (OpEx), in line with the European Union's regulatory framework introduced in June 2020 to promote sustainable investment. These companies are aligning their reporting with the taxonomy classification, ensuring greater financial and environmental performance transparency. Integrating these indicators enhances their ability to meet compliance obligations and attract sustainability-oriented investors.

The largest company in the Czech construction market, the Metrostav Group, represents four large companies (Metrostav a.s., Subterra a.s., Metrostav Infrastructure a.s., and Metrostav DIZ a.s.). The Group's annual report includes chapters on sustainability, specifically on environmental protection, occupational safety, research and development, employees, and social responsibility. From 2022 onwards, its business activities will be assessed and monitored from a sustainability perspective in order to meet the criteria for sustainable financing. To date, sustainability data has been more qualitative in nature. The company does not publicly report greenhouse gas (GHG) emissions but has committed to a significant reduction in Scope 1 and 2 emissions by 2030.

The second largest company in the sector is STRABAG a.s., which, together with STRABAG Rail a.s., is part of the STRABAG SE Group. For the first time, this group included a sustainability report in its annual report, prepared in accordance with GRI standards. Since 2011, the company has been tracking Scope 1 and 2 GHG emissions according to the GHG Protocol methodology and is currently working on the calculation of Scope 3 emissions. From 2022 onwards, the company will also report on three key taxonomic indicators: sales, capital expenditure (CapEx), and operating expenditure (OpEx). As shown in Table 2, the proportion of activities that meet the EU taxonomy criteria is gradually increasing.

Table 2
Taxonomic indicators of STRABAG SE

EU Taxonomy Indicator	Revenue [%]		CapEx [%]		OpEx [%]	
Reporting Year	2022	2023	2022	2023	2022	2023
Business activities falling under the EU taxonomy framework	6.39	7.23	2.87	4.15	4.09	5.34
Activities not meeting EU taxonomy criteria	31.17	65.44	34.63	50.28	19.19	52.65
Non-compliant activities	62.44	27.33	62.5	45.57	76.72	42.01

Another important company in this area is OHLA ŽS a.s., a subsidiary of the OHLA Group. The company has been publishing sustainability information in its integrated annual report since 2017. In 2018, the company reported greenhouse gas emissions in all three categories (Scope 1, 2, and 3) for the first time. Scope 3 emissions are 16 times higher than the sum of Scope 1 and 2 emissions, with 83% of these indirect emissions coming from the supply chain, mainly from purchased products and services. Table 3 shows the results of the first taxonomy of sales and capital expenditure (CapEx) for 2022. The company does not consider operating expenditure (OpEx) to be a material indicator and, therefore does not include it in the report.

Table 3
Taxonomic Indicators of the OHLA Group

EU Taxonomy Indicator	Revenue [%]	CapEx [%]
Reporting Year	2022	2022
Business activities falling under the EU taxonomy framework	15.0	18.7
Activities not meeting EU taxonomy criteria	70.3	63.5
Non-compliant activities	14.7	17.9

SKANSKA AB has published an Environmental Impact Report since 1997. Until 2001, it published environmental information in the form of separate environmental reports, after which it switched to the sustainability report format. Based on the GHG Protocol, the company has measured its carbon footprint in the Scope 1 and 2 categories since 2010 and in Scope 3 since 2018. Between 2015 and 2022, the company will reduce its Scope 1 and 2 emissions by 55%, while between 2020 and 2022, it will reduce its Scope 3 emissions by 13%. For the first time, SKANSKA reported taxonomic indicators for sales and capital expenditure (CapEx) for 2021. It does not consider operating expenditure (OpEx) to be relevant and, therefore, does not include it in its calculations. The results of three years of reporting are summarized in Table 4, which confirms the increasing proportion of eligible activities. The company also manages climate risks and opportunities as the TCFD standard recommends.

Table 4
Taxonomic indicators of SKANSKA a.s.

EU Taxonomy Indicator	Revenue [%]			CapEx [%]		
Reporting Year	2021	2022	2023	2021	2022	2023
Business activities falling under the EU taxonomy framework	-	2	7	-	0	40
Activities not meeting EU taxonomy criteria	56	90	85	10	97	60
Non-compliant activities	44	8	8	90	3	0

PORR a.s. publishes a sustainability report as part of its annual report. It follows the recommendations of the TCFD standard for managing climate risks and opportunities. From 2019, it will report its GHG emissions in all categories of the GHG Protocol, with Scope 1 accounting for the largest share - more than double the sum of Scopes 2 and 3. From 2022, the company also reports three taxonomic indicators (sales, CapEx, and OpEx). Table 5 shows the share of eligible and non-eligible activities in 2022 and 2023.

Table 5
Taxonomic indicators of PORR AG

EU Taxonomy Indicator	Revenue [%]		CapEx [%]		OpEx [%]	
Reporting Year	2022	2023	2022	2023	2022	2023
Business activities falling under the EU taxonomy framework	4.5	3.8	3.3	2.5	4.2	2.1
Activities not meeting EU taxonomy criteria	29.6	43.7	11.3	17.0	5.0	19.9
Non-compliant activities	65.9	52.5	85.4	80.5	90.8	78.0

HOCHTIEF AG, the parent company of HOCHTIEF CZ a.s., has provided sustainability information since 2001. In 2014, it began preparing a sustainability report in accordance with GRI standards and included it in its annual report. In the same year, it also started to report GHG Scope 1 to 3 emissions in accordance with the GHG Protocol. Since 2021, the company has been reporting taxonomic indicators, with the proportion of non-eligible activities decreasing each year, as shown in Table 6.

Table 6
Taxonomic indicators of HOCHTIEF AG

EU Taxonomy Indicator	Revenue [%]			CapEx [%]			OpEx [%]		
Reporting Year	2021	2022	2023	2021	2022	2023	2021	2022	2023
Business activities falling under the EU taxonomy framework	-	8.8	10.0	-	10.6	16.0	-	11.6	7.7
Activities not meeting EU taxonomy criteria	91.0	83.5	80.0	80.0	30.2	31.8	82.0	79.5	86.3
Non-compliant activities	9.0	7.7	10.0	20.0	59.2	52.2	18.0	8.9	6.0

4. Conclusions

Research into the non-financial data of the top 50 construction companies shows a significant shift towards sustainability and a responsible approach to climate change. Many companies are actively tracking and reducing their CO2 emissions and reporting per GRI standards and TCFD recommendations. Some companies are starting with Scope 3 reporting but have long tracked Scope 1 and 2 emissions and are focusing on integrating taxonomic indicators. This trend indicates a growing emphasis on environmental responsibility in the construction industry, which is key to achieving climate change targets and long-term sustainability.

The analysis of non-financial information also shows that most foreign companies operating in the Czech market through their subsidiaries have highly developed sustainability reports. They include the GRI standard and GHG reporting according to the GHG Protocol. There is a strong focus on reducing GHG emissions and eliminating activities that are not in line with the taxonomy. On the contrary, it was found that no Czech company or company with a Czech parent company currently publishes information on its GHG emissions and taxonomy indicators.

Finally, recommendations for construction companies can be formulated based on the qualitative research results. Companies should implement GRI and TCFD standards for transparent reporting of CO_2 emissions, starting with Scope 1 and 2 and gradually expanding to Scope 3. Setting emissions targets, using green materials, and optimizing the supply chain are important. Companies should regularly disclose non-financial information, engage stakeholders, and look to foreign companies with mature ESG strategies for inspiration. Industry cooperation and integrating taxonomic indicators will help Czech companies keep pace with the increasing demands for sustainability and competitiveness.

5. Recommendations for Czech-Owned Construction Companies

To improve ESG reporting and align with international sustainability standards, Czech-owned construction companies should consider the following actionable steps:

i. Adopt ESG reporting frameworks: Companies should adopt internationally recognized frameworks such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD). These frameworks provide structured methodologies for disclosing sustainability data, thereby improving transparency and comparability.

ii. Invest in sustainability training: Companies should provide targeted training programs for managers and employees to build expertise in ESG reporting. Training should focus on taxonomy compliance, carbon footprint measurement, and sustainable business practices.

iii. Leverage government incentives: Companies should explore available government grants and tax incentives for sustainability initiatives. These may include financial support for energy-efficient technologies, green infrastructure projects, and carbon reduction programmes.

iv. Improve data collection and management: Implementing digital data tracking and reporting tools can improve accuracy and efficiency. Advanced ESG software solutions can streamline compliance with EU regulations and simplify reporting processes.

v. Collaborate with industry associations: Partnering with business networks and sustainability organizations can provide access to best practices, regulatory updates, and benchmarking data. Czech companies should engage with organizations such as the Czech Green Building Council or international ESG alliances.

vi. Gradually expand GHG reporting: Companies that currently only report Scope 1 and 2 emissions should work towards including Scope 3 emissions to provide a more comprehensive view of their environmental impact. This step will enhance credibility with investors and stakeholders.

vii. Integrating ESG metrics into financial strategy: Aligning sustainability goals with financial performance metrics can improve investor confidence and attract responsible capital. Companies should communicate the economic benefits of ESG initiatives, such as cost savings from energy efficiency and improved access to green finance.

By implementing these strategies, Czech construction companies can improve their ESG performance, meet regulatory expectations, and strengthen their competitive position in the evolving market landscape.

Data Availability Statement

All data utilized in this research were sourced from publicly accessible records, including corporate websites and annual sustainability reports of the 50 leading construction companies operating in the Czech Republic. As these data are publicly accessible, no additional datasets were generated or archived. References to specific sources are provided within the article.

Conflicts of Interest

I declare that I have no financial interests or personal relationships that could be perceived as influencing the work presented in this paper. The funders had no involvement in the study's design, data collection, analysis, or interpretation, not in the manuscript writing or the decision to publish the findings.

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