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QUALITY OF NON-FINANCIAL INFORMATION IN THE CONTEXT OF CORPORATE SUSTAINABILITY REPORTING DIRECTIVE (CSRD)

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Abstract. Recent developments in the EU regulatory framework, from the 2014 Non-Financial Reporting Directive (NFRD) to the 2021 Corporate Sustainability Reporting Directive (CSRD), have significantly increased ESG disclosure requirements for a more significant number of companies. Despite numerous studies on non-financial information, few specifically address the CSRD. This paper contributes to bridging this research gap. This paper aims to evaluate the quality of non-financial information (NFI) disclosed by companies subject to the CSRD from 2025, compare it to CSRD standards, and explore any correlation with company size. To achieve this aim, data on non-financial information (NFI) from 53 companies in a selected EU country was collected from annual reports and other sources, converted to quantitative indicators, and assessed to create Non-Financial Information Indexes (NFIIs). Using descriptive statistics, the construction of Company Size Indexes (CSI) and the application of Pearson's correlation coefficient, it was found that NFI quality does not meet CSRD standards and is positively, but not statistically significantly correlated with company size. The practical importance of this document is to provide feedback to companies on their non-financial reporting concerning CSRD standards and inform policymakers on this issue. The theoretical contribution lies in proposing a method for evaluating the published quality of NFIs based on the CSRD criteria and providing new insight into the correlation between NFI quality and company size.

Keywords: Corporate Sustainability Reporting Directive (CSRD), disclosure; non-financial information; non-financial reporting, quality.

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1. Introduction

In recent years, particularly within the European Union (EU), the regulatory landscape for non-financial reporting (NFR) has undergone significant developments. The EU's Non-Financial Reporting Directive (NFRD) in 2014 marked a seminal moment, setting the stage for enhanced disclosure requirements focused on providing stakeholders with a deeper understanding of a company's ESG (Environmental, Social, Governance) activities. According to La Torre et al. (2018), this directive improved the comparability of information and enhanced corporate accountability. NFRD is, however, currently being developed further by the Corporate Sustainability Reporting Directive (CSRD) proposed in 2021, with effect on 5th January 2023.

Compared to the NFRD, the CSRD expands the scope and detail of mandatory disclosure of non-financial information (NFI). For almost 50,000 companies in the EU, collecting and sharing sustainability information

will become the norm, compared to 11,700 companies subject to the NFRD (European Parliament, 2022). Companies covered by the CSRD must report according to the European Sustainability Reporting Standards (ESRS), which apply, with certain exceptions, from 1 January 2024 (European Commission, 2024). These standards aim to ensure unified, relevant, credible and reliable information on sustainability and the company across various environmental, social and governance issues. (Veber et al., 2023)

Many researchers have already emphasised the importance of NFR (NFI disclosure) in previous studies. Aguado-Correa et al. (2023) stated that non-financial information and its contribution to the achievement of the various Sustainable Development Goals (SDGs) is becoming vital in a business world where it is not enough to be economically sustainable without also being ethically, environmentally, and socially sustainable. Veber et al. (2023) say that NFR could contribute significantly to implementing the Green Deal. Similarly, Krawczyk (2021) stated that NFR is essential to demonstrate progress towards the Sustainable Development Goals (SDGs). Tarquinio & Posadas (2020) suggest that reporting non-financial information complements financial information, while (Velte & Stawinoga, 2017) see a key role of NFR in management control and stakeholder relations management.

Many researchers already focused on the impacts of NFR and the relationship between NFR and some company characteristics. Aluchna et al. (2022) and Cicchiello et al. (2023) proved that the introduction of NFRD positively impacts ESG performance. Aboud et al. (2024) see the mitigating effect of NFRD on ESG decoupling. Cuomo et al. (2022) concluded that firms that adopted corporate social responsibility (CSR) reporting experienced lower systematic risk and cost of equity after the enactment of the NFRD. Bigelli et al. (2023) concluded that NFRD has a positive impact on the board characteristics (e.g., gender diversity, cultural diversity, etc.), which was indirectly confirmed by Velte (2023) concluded that gender diversity had a positive impact on CSR performance and reporting. Abdullah et al. (2020) examined the relationship between environmental disclosure and company performance. Some other researchers tested the relationship between NFR and new technologies. Seretakakis & Mezzanotte (2023) claim that the blockchain can help firms meet the CSRD's sustainability reporting requirements more effectively. Mehedintu & Soava (2023) see a positive influence of digitalisation on environmental performance.

There are also studies dealing with the quality of NFR. Ottenstein et al. (2022) argue that NFRD positively impacts the quantity and quality of sustainability reporting. Beretta et al. (2023), Radu et al. (2023) and (Velte, 2023) found that the conciseness, completeness and readability of NFR are significantly associated with board composition. Santamaria et al. (2021) highlight that the combinations of quality and quantity of non-financial disclosures (NFDs) play a significant role in the achieved level of ESG score. Monteiro et al. (2022) stated that the quality of NFI does not directly contribute to non-financial performance but indirectly through decision-making success. Dragomir et al. (2022) and Radu et al. (2023) proved a positive association between company size and the quality of the NFR; however, in the first case, linked to one specific country and a particular sample of companies and, in the second case as a result of systematic literature review, thus based on the secondary data.

Some studies already focused on new CSRD. One of those opens an interesting new factor – the impact of double materiality, with the identification of related potential legal risks and uncertainties (Mezzanotte, 2023). However, mandatory reporting requirements within the EU may also have unforeseen consequences for smaller companies that may be reluctant to include non-financial aspects in their reports (Kolk, 2010; Gavurova et al., 2022), even suggesting that a long list of possible CSR indicators in reports could discourage smaller companies from reporting on CSR (Gavurova et al., 2020; Belas et al., 2022).

The researchers' suggestions for additional surveys in the given research field also underline the topic's significance. Mezzanotte (2023), Posadas et al. (2023) and Ottenstein et al. (2022) identify the need for further research on the development of the respective legislation and its impact. Radu et al. (2023) provide even set of recommendations for the research – e.g., research on how different stakeholders react to different characteristics of NFD's, research on differences between the reporting under NFRD and CSRD, research on the risk of greenwashing in relation to the CSRD and research on the quality of sustainability reporting, which is also

supported by Aboud et al. (2024), who recommend investigating the impact of the NFRD on the quality of ESG reporting.

Building on previous studies and respecting the researchers' recommendations for further research, this paper aims to answer the question of what is the level of quality of non-financial information disclosed by all companies in the energy sector in the Czech Republic that have the potential to fall under mandatory NFR under the CSRD from 2025, compare to the level of quality envisaged by CSRD, and whether there is some correlation between the quality of this NFI disclosure and the size of the company. The fulfilment of the first part of the aim will provide specific information about the quality level of selected companies in the context of the upcoming CSRD. The fulfilment of the second part will enable a deeper understanding of the dynamics of non-financial reporting and will confirm or refute the findings of other researchers.

The reason for choosing a specific limited sample is the fact that the energy sector is a key sector of the national economy in all EU countries and, at the same time, one of the most significant contributors to environmental pollution, and therefore, should be the primary focus of our interest in this specific area of research. The Czech Republic can be considered a representative average sample across the EU in terms of industrial development, energy mix, and legislative status.

To meet the aim, two research questions are defined. RQ1 is used to assess the quality of non-financial information disclosed by selected companies, and RQ2 is used to determine whether there is some correlation between the quality of NFI disclosed by these companies and their size.

RQ1: What is the level of quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD?

Considering the nature of this research question, no hypothesis is defined in relation to this question.

RQ2: What is the relationship between the quality of the non-financial reporting and the company's size?

The following hypotheses are defined in relation to this research question: the null hypothesis H0 and the alternative hypothesis H1.

H0: There is no association between the quality of non-financial information disclosed by the company and the size of the company.

H1: The quality of non-financial information disclosed by the company is positively associated with the size of the company.

For clarity, the quality in the context of this paper also includes the amount of non-financial information disclosed.

2. Literature review

Considering the given research questions, the literature review focuses on data collection and processing methods related to evaluating the quality of NFI, which will create the basis for answering both questions.

To get the most comprehensive result, the principles of a systematic literature review are applied. Systematic literature review (SLR) differs from traditional narrative reviews by adopting a replicable, scientific, and transparent process. It helps to collect all related publications and documents that fit our pre-defined inclusion criteria to answer a specific research question (Mengist et al., 2020). During SLR process, 123 articles from the Web of Science databases (WoS) maintained by Clarivate Analytics and Scopus operated by Elsevier were identified using a predefined search string: "quality of non-financial reporting" OR "quality of non-financial

information" OR "quality of non-financial disclosure" OR "quality of ESG reporting" OR "quality of CSR reporting" OR "quality of integrated reporting" OR "quality of triple bottom line reporting" OR "quality of green reporting" OR "quality of double bottom line reporting" OR "quality of SDG reporting" OR "quality of CSR disclosure" OR "quality of ESG disclosure" OR "quality of sustainability disclosure" OR "quality of environmental disclosure" OR "quality of social disclosure" OR "quality of governance disclosure" OR "quality of ethical disclosure" OR "quality of green accounting", the result of an iterative process during which different keyword options and combinations, and search limitations (search within: article title, abstract, keywords; publication years: 2019, 2020, 2021, 2022, 2023, 2024; document types: article or review article or early access; languages: English), after removal of duplications. This number was then narrowed down based on defined inclusion and exclusion criteria (the only exclusion criterion was that the article was identified as a possible false positive. However, some articles were also excluded for other reasons, primarily because the articles were not available in open access), to 75 articles included in the review.

The result of the first part of SLR, dealing with selecting articles for the review, is explained by using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 flow diagram for systematic review (Figure 1).

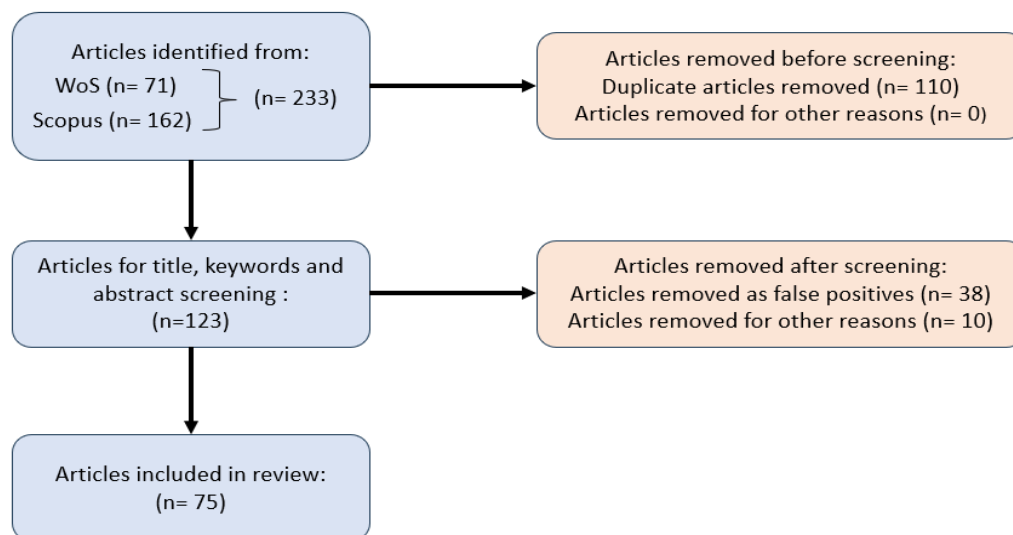


Figure 1. Flow diagram of SLR process

Source: own elaboration, design modified from PRISMA 2020 flows diagram proposed by Page et al. (2021).

The following are the results of the second part of the SLR process: an overview of selected key relevant findings related to data collection and processing methods in assessing the quality of NFIs and general findings related to the quality of NFIs.

Although the quality of non-financial disclosure is widely debated in the research community, there is no consistent approach to the issue. As stated by (Baalouch et al., 2019), there is no generally accepted definition of non-financial disclosure quality. Still, as further noted in their paper, in the previous studies, some researchers concluded that the quality is related to the extent to which the disclosure is helpful to external and internal parties. Because via the non-financial information, enterprises can better explain the company's strategy, social responsibility and business performance description in addition to the financial data of financial statements on financial position, operating results and cash flow, which facilitates the public's access to the relevant accounting information of enterprises and helps to improve the quality of accounting information (Zhang & Wang, 2024).

As outlined by Ismail et al. (2021), various guidelines have been established for the measurement of non-financial information, including the triple bottom line, Directive 95/2014/EU and the Global Reporting Initiative (SDG Compass, b.r.). The quality of non-financial disclosures can be assessed in various ways, including

subjective ratings, disclosure index studies, thematic content analysis, readability analysis and linguistic analysis (Le et al., 2022).

Busco et al. (2020) introduced a "Disclosure Topic Compliance Index" (DTCI), measured as the ratio of the number of disclosure topics for which the company reported at least one accounting metric to the total number of disclosure topics assumed by the relevant reporting standard. Baalouch et al. (2019) adopt five attributes: 'Relevance', 'Neutrality', 'Clarity', 'Comparability' and 'Verifiability', synthesising them using the simple arithmetic mean. Zhang & Wang (2024) considered three areas of the quality of NFI – similarity (with all other companies in the same industry), readability and forward-looking. Cosma et al. (2020) offer the methodology for the evaluation of the NFI quality based on the interpretation of any possible quantitative and qualitative content inspired by the 17 SDGs (GRI, the UN Global Compact and the World Business Council for Sustainable Development, n.d.), included in "non-financial statements" and "consolidated non-financial statements", relating to a specific accounting period, and taking into account the number of SDGs reported, the level of detail in the reporting, the number of sections in which the SDGs appear and the number of stakeholders. GRI-based evaluation of the NFI quality is offered by Orazalin & Mahmood (2020). Hategan et al. (2021) used a 5-point scale based on the completeness of the NFI included in NFI reports to assess the quality of NFI in these reports. Other researchers have also applied the evaluation of the NFI quality based on NFI's completeness (Le et al., 2022; Khan et al., 2019). The scoring process for evaluating the NFI quality is also implemented by Katmon et al. (2019), using financial and non-financial information. Ananzeh (2022) developed a methodology that introduced four CSR dimensions (human resources, environment, product stewardship and community engagement) working with a total of 41 indicators, assessing their occurrence in company documents and simply coding this occurrence – an item was scored as 0 if it was not disclosed in the annual report and 1 if it was disclosed. This created the input for calculating four CSR disclosure-related aspects (relative quantity, intensity degree, accuracy degree and management outlook). The study of Miao et al. (2021) applied score rates the status of CSR disclosure in four dimensions: overall (M) dimension, evaluated from the perspectives of corporate strategy, corporate governance, and stakeholders, with a total score of 30 points, content (C) dimension, evaluated from the perspectives of performance, human rights, environment, customer, and community involvement, with a total score of 45 points; technical (T) dimension, evaluated from the perspectives of comparability, credibility, standardisation, innovation, and transparency, with a total score of 15 points; and industry (I) dimension considering the special conditions of some industries, with a total score of 10 points, and the total score of the four items is 100 points. A similar approach was chosen by Badrul Muttakin et al. (2022) prepared the CSR disclosure index following the GRI sustainability reporting guidelines, which means that the index consisted of five categories (environment, labour practices, human rights, society, and product responsibility) and altogether 75 items, again scored by the occurrence of the information, using 4-point scale (from 0 to 3). A variation on the same theme is also offered by Dang et al., (2023) introducing the CSR disclosure index by evaluating the scores of five sets of criteria on a 0-1 scale; by (Omar & Alkayed, 2021) constructing an CSR index covering 36 items in 4 themes (environmental, human resources, community, products and others), measuring the quantity of CSR via the number of sentences and the quality of CSR by the weighting approach (on a scale of 0–3); by Shafai et al. (2022) developing a CSRD quality checklist comprising 40 items, scored three points if the disclosures include monetary data, two points if the CSR disclosures are comprehensive, one point if the disclosures are brief and 0 points if the disclosures are not disclosed at all; by Rauf et al., 2021) introducing disclosure index as per the GRI Sustainability Reporting Guidelines, modified based on the ten items already prescribed for the non-financial information by regulators - protection of shareholders in terms of corporate governance, meeting the benchmarks of returns, risk control, regularity in disclosure of operational information, shareholders review meetings, and timely communication, when these items were assigned with scores ranging from 0 to 3 points (0 if there is no information existing, 1 if only non-quantitative aggregate information is available, 2 if quantitative information is provided, and 3 if fiscal information is available); by Alkayed & Omar (2023) using CSRD index based on four categories (environmental, human resources, product and consumers, and community involvement), containing in total 40 items, processing by scoring and statistical methods; and by others. Evaluation of the NFI quality by the IR checklist contains 38 specific items under eight main categories based on the International Integrated Reporting Council (IIRC) framework (strategic focus and future orientation, connectivity of information, stakeholder relationship, materiality, risk management practices, conciseness, reliability and completeness and consistency, comparability and assurances) is used by Erin & Adegboye, (2022). Hassan (2021) utilised, concerning the

evaluation of the quality of NFI in annual reports, a simpler 2-point scale system - 1, if the disclosure is quantitative disclosure, graphs or narrative disclosure reports the actual policies and activities of a company concerning its social responsibility. 0, otherwise, whereby the quality score was measured by evaluating each sentence in social disclosure according to the previous rating and then was calculated as the average score (total score/number of sentences). Another approach to the evaluation of the NFI quality had Bini et al. (2023), who developed a method based on the evaluation of the consistency of disclosed non-financial key performance indicators (NFKPIs) analysis whether there is a development in the number of NFKPIs in time.

The SLR demonstrated no uniform approach to measure or evaluate the quality of NFI/NFR/NFD. However, there are also no fundamental contradictions. Almost all the methods used are similar in some way, differing more in the level of detail than in the underlying principle. Some of the methods used in the studies are based on evaluating the quality of NFIs against some official standards such as GRI's, SDG's, IFRS, etc., while some studies develop their benchmark in this respect. In both cases, however, the defined index, scoring principle and statistical methods are mostly used to process the data.

What is logically consistent in this area of research are the sources of data - annual reports and any publicly available non-financial information, either in reports or separately, e.g., on company websites, as well as the methodology of data collection. from the sources – the content analysis, i.e. the methodology that quantifies qualitative information (Erin & Adegboye, 2022). In most cases, This content analysis was performed manually by simply reading the selected document; however, some researchers, e.g. (Aguado-Correa et al., 2023), also used the tools of artificial intelligence (Natural Language Processing algorithm).

Some researchers have also analysed the development of NFI quality over time. In such cases, they mostly used the same methodology of evaluation of NFI quality one-time, just applied to the data from different years. Still, some of them used a different approach, e.g. (Omar & Alkayed, 2021), by establishing the paired sample t-test and Wilcoxon signed rank tests to reveal a change in the extent and quality of CSR disclosure practices.

The results of the SLR demonstrate that the most prevalent methodology (used in 55 studies of 75 studies included in the review) for evaluating the quality of published NFI is one based on a comparison with a selected official standard or a developed benchmark, using defined index, scoring principles and statistical methods. Given the nature of the research questions and the existence of relevant standards and directives (CSRD, ESRS and transposition of CSRD into Czech legislation in the form of an amendment to the Accounting Act), the most appropriate method for evaluating the quality of NFI published by companies in the Czech energy sector that are subject to mandatory NFRs under the CSRD from 2025 will be the method based on the defined index, using the ESRS or the provisions on Sustainability Reports under the amendment to the Accounting Act as a benchmark, with the application of scoring and statistical methods used by some of previous researchers.

The specifics of the research question RQ2 were already mentioned in Chapter 1. Dragomir et al. (2022) and Radu et al. (2023) demonstrated a positive relationship between firm size and NFR quality. A standard statistical method will evaluate the correlation between two sets of variables to test the defined hypothesis.

3. Data and methods

In accordance with the given research questions, the sample consists of companies in the Czech energy sector that have the potential to be subject to mandatory NFR within the framework of CSRD from 2025. However, to the authors' knowledge, there is currently no publicly available list of these companies. Thus, the selection of such companies was developed using our method for this paper.

According to the respective legislation, starting in 2025, the reporting requirements under the CSRD will apply to (i) large companies already subject to NFRD, and (ii) all large companies that have more than 250 employees, and a net turnover of more than EUR 40 million, or a total balance sheet exceeding EUR 20 million. To define the sample of companies from the Czech energy sector, the following approach was employed. The holders of the licenses from the Czech Energy Regulatory Office were identified using the licenses finder tool, accessible via the following link: <https://eru.gov.cz/vyhledavac-licenci>. The licenses in question were granted in the fields

of electricity production, electricity distribution, electricity transmission, gas production, gas storage, heat production, and heat transmission. However, the search in the fields of electricity production, electricity distribution, heat production, and heat distribution yielded an overwhelming number of results (approximately 30,000 companies). Consequently, it was necessary to limit the search further. The license finder allows the use of the filter based on installed power. The level of installed power was set at 10 MWe, with the assumption that the level of assets in the balance sheet was EUR 20 million or above and EUR 2 million per installed MW. This proposal was based on the cost of new installations, which ranged from EUR 0,5 million in the case of gas and solar PV to almost EUR 10 million per MW in the case of nuclear. Thus, the representation of individual sources in the energy mix was also estimated. The alternative approach, based on a net turnover of EUR 40 million and above, an average annual production rate (considering the average utilisation per sources), and an electricity price of approximately EUR 100 per MWh, would result in a filter of 90 MWe.

Consequently, a filter of 10 MWe was employed to avoid the risk of omitting some companies. A similar approach was used in the case of heat production, resulting in a filter of 200 MWt. This procedure resulted in the initial sample of 135 companies, in total, across the selected fields from the Czech energy sector, including however also companies from other sectors, with different core activities but providing, to a not insignificant extent, energy-related services in this paper, thus considered also as companies from the Czech energy sector. The initial sample will subsequently be subjected to further selection to identify those companies that fulfil the specified conditions. As mentioned above, these include having a minimum of 250 employees and a net turnover of at least EUR 40 million, or a total balance sheet exceeding EUR 20 million.

Due to this proposed sample selection procedure, it can be stated that the sample will be equal to the population in this case. The transferability of the findings from this study to companies from other sectors or other EU countries can, of course, be questioned; however, the reason for choosing a particular sector was already justified at the beginning of this study, and similar studies can easily confirm the general validity across the EU. Moreover, similar studies from other countries already exist, and as part of the discussion in this study, their results will be confronted with the result of this study.

To answer **RQ1**, i.e. to answer what the quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD, following data sources, the data collection and data processing method will be used.

Data sources (data means *information* as defined and further specified in the text below) are the most available annual reports and other relevant reports or websites of selected companies to get the most comprehensive *information*.

The **data collection method**, in line with the methodologies used by all previous researchers in this field of research, is manual content analysis; the use of artificial intelligence tools is not considered.

Consistent with the results of the literature review, based on previous studies in this area, the quality of NFI disclosure of selected companies will be evaluated using an index, which is labelled, similar to the study of Carmo & Ribeiro (2022), as the non-financial information index (NFII).

The provisions of the sustainability report inspire the construction of this index in this paper according to the amendment to the Accounting Act No. 563/1991, which is the first part of the transposition of the CSRD into the Czech legislation and according to which the purpose of the sustainability report is to provide, as a separate section of the annual report, the information necessary to understand the impact of the entity's activities on sustainability and to understand the impact of sustainability on the development, performance and position of the entity (Accounting Act No. 563/1991, 2024). Sustainability means environmental matters, social matters, human rights matters, governance matters, employee matters, and anti-corruption and anti-bribery matters.

The proposed NFII, thus, should logically consist of six sub-indexes: environmental matters (ENV), social matters (SOC), human rights matters (HUM), governance matters (GOV), matters related to employees (EMP),

and anti-corruption and bribery matters (COR). Similar categories can be found, e.g., in Gláserová et al.'s study (2024). However, considering the utmost importance NFI disclosure (NFR) as a tool how to demonstrate progress towards the SDGs (Krawczyk, 2021), one additional sub-index focus specifically on whether the sources contain a description of the entity's plans to ensure that the entity's business model and strategy are compatible with the transition to a sustainable economy and with limiting global warming to 1,5 °C by the Paris Agreement and to achieve climate neutrality by 2050 under the directly applicable European Union legislation governing the European climate legal framework – the sub-index SDG. A similar approach, in terms of evaluation of NFI quality based on SDG, was introduced by Cosma et al. (2020).

Each sub-index is rated on a five-point scale, following the procedure used by Hategan et al. (2021), according to the extent of the information and its occurrence. This information, in the context of this methodology, means the information necessary to understand the impact of the entity's activities on sustainability and the impact of sustainability on the development, performance and position of the entity (hereafter referred to as *information*). The decisive factor for evaluation is the occurrence of the topic rather than the extent. A detailed description of the scoring scale is in Table 1 below.

Table 1. Description of the scoring scale

Score	Description
0	No <i>information</i> is available in the annual report, other reports, or websites (further as "other sources").
1	Limited <i>information</i> in other sources.
2	Limited <i>information</i> in the annual report or in the annual report and other sources.
3	Almost comprehensive <i>information</i> is available (in the annual report or other sources).
4	Comprehensive <i>information</i> is available in the annual report.

Source: own elaboration based on Hategan et al. (2021)

As seen from the above description, the total number of points each company can receive is 28 (7x4).

Regarding the **data processing method**, the descriptive statistical methods will be used to determine the mean, standard deviation, minimum, median, and maximum after evaluating the NFI quality level of each of the sampled companies (all sub-indexes), which is entirely in line with the previous studies, e.g. Hategan et al. (2021); Katmon et al., (2019); Carmo & Ribeiro (2022); Ananzeh (2022) and others.

Regarding **RQ2**, the data sources are the same as for RQ1, respectively, the data will already be available from the section dealing with RQ1. However, in additionally to the RQ1, hypothesis H1 defined for RQ2 needs to be tested, which will be performed by using the Pearson correlation coefficient (r), calculated according to the following formula:

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{(n\sum x^2 - (\sum x)^2)(n\sum y^2 - (\sum y)^2)}}$$

Where:

- n is the total number of elements in the sample (i.e. the number of companies)
- x is the independent variable in the dataset (company size index)
- y is the dependent variable in the data set (non-financial information index)

The size of each company in the sample will be determined using a purpose-built company size index (CSI) calculated according to the following formula:

$$CSI = (w_E n_E) + (w_T n_T) + (w_A n_A)$$

Where:

- w_E (w_T , w_A) is the weight of variable n_E (n_T , n_A)
- n_E is the normalised number of company employees
- n_T is the normalised size of the company's turnover
- n_A is the normalised size of the company's assets

The weights are proposed in the following values: $w_E = 50\%$, $w_T = 25\%$ and $w_A = 25\%$. The reason for this distribution can be found in the CSRD, in the condition defining whether a company falls under the CSRD. The primary condition is the number of employees, and the secondary condition of equal weight is turnover or asset size.

To get the normalised values for the company x from the sample, the principle of min-max normalisation will be applied based on the following formula:

$$n_{E(T,A)} = \frac{n_{E(T,A)x} - \min_{E(T,A)}}{\max_{E(T,A)} - \min_{E(T,A)}}$$

Where:

- $n_{E(T,A)x}$ is the number of employees (value of company's turnover, value of company's assets) of the company x
- $\min_{E(T,A)}$ is the minimal number of company employees (minimal value of company's turnover, minimal value of company's assets) from the sample
- $\max_{E(T,A)}$ is the maximal number of company employees (maximal value of company's turnover, maximal value of company's assets) from the sample

A general comment on methodology at the end of this chapter - as is evident from the literature review in the previous chapter, there is no single correct methodology. On the contrary, in those areas of human interest that are only partially based on exact and rigid facts, there is a tendency to propose a plethora of techniques and methodologies. This fact has been highlighted by Veber et al. (2023), who, in their publication, summarised ISO and other institutions' standards relating to the environment, sustainability, climate change and circular economy, identifying almost 100 ISO standards and more than 10 valid standards. As a related issue, it should be noted that standards and norms do not always consider the sector's specificities. This should always be considered when selecting valid norms, standards and methodologies, and the fact that the results are likely to be relative, not always wholly objective and of general validity.

4. Result

This chapter is divided into two subsections, first presenting the findings according to the research questions RQ1 and second dedicated to findings related to RQ2. However, information about the final sample needs to be provided before the presentation of the research results.

As mentioned in the previous chapter, the initial sample consists of 135 companies from the Czech energy sector selected according to a specific defined key. To obtain the final sample, it was necessary to verify for these pre-selected companies whether they meet the conditions set out in the legal framework for companies to be covered by the CSRD from 2025, i.e. a minimum of 250 employees and a net turnover of at least EUR 40 million or a total balance sheet exceeding EUR 20 million. This verification was done using a freely accessible database of Czech firms available at <https://www.informaceofirmach.cz/>, where information on the number of employees and net turnover is available. In the case of a company with more than 250 employees but a net turnover of less

than EUR 40 million, the balance sheet information from the annual report of the company concerned, available from the public register, was further verified. The procedure described above led to a final sample of 53 companies.

4.1 NFI disclosure quality

Evaluation of quality of NFI disclosure of the selected companies, by the methods described in Chapter 3, specifically by NFII, answers the RQ1, i.e. reveal what is the quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD.

In accordance with the defined procedure, annual reports from 2022 were used as data sources, as annual reports from 2023 were almost unavailable. Plus, the latest available sources such as websites, ESG reports, etc. The result of the descriptive statistic for NFII and its sub-indexes is shown in Table 2 below.

Table 2. Result of the descriptive statistic_RQ1

Index	Mean	SD	Min	Median	Max
ENV	2.42	0.77	0.00	2.00	4.00
SOC	2.02	1.13	0.00	2.00	4.00
HUM	1.30	1.49	0.00	2.00	4.00
GOV	1.68	1.38	0.00	2.00	4.00
EMP	2.30	0.82	0.00	2.00	4.00
COR	1.55	1.49	0.00	2.00	4.00
SDG	1.35	1.52	0.00	0,00	4.00
NFII	12.58	7.76	0.00	10,00	28.00

Source: own elaboration

The average score of NFII, calculated using the defined sub-indexes, is 12.58 (i.e., 44.92% of the maximum value), while the median is 10,00 (i.e. 35.71% of the maximum value). Standard deviation is high (7.76), indicating a large variance, which is confirmed by minimal (0) and maximal (28.00) value of NFII. The sample population has a positive skew in NFII values at 0.30, indicating a higher frequency of lower values. Two companies achieved a maximum, 28.00 points, and one company got 0 points. 18 companies achieved 21 points, having almost comprehensive or comprehensive *information*, but not in the annual report.

Although not a direct part of the aim, focusing on the occurrence of information can also provide interesting insights into the quality of NFI disclosure. Regarding the occurrence of *information* related to the sub-indexes, almost all companies (96.23%) provided, to a different extent and in another source, *information* related to environmental matters (ENV), while the lowest occurrence in the sample, 47.17%, had the SDG sub-index, which indicates whether the company is in some way committed to the global Sustainable Development Goals (SDGs). Further details are provided in Table 3 below.

Table 3. Occurrence of *information*_RQ1

Index	ENV	SOC	HUM	GOV	EMP	COR	SDG
% of occurrence	96,23%	83,02%	49,06%	64,15%	94,34%	54,72%	47,17%
No. of companies	51	44	26	34	50	29	25

Source: own elaboration

The occurrence is, logically, higher when annual reports and other sources are considered than when only annual reports are considered. However, as stated in Chapter 3, Data and Methods, according to the amendment to the Accounting Act No. 563/1991, which is the first part of the transposition of the CSRD into Czech legislation,

the *information* should be included in the annual report. Thus, it might be interesting to identify the influence of the other sources. The result is shown in Table 4 below.

Table 4. Occurrence of information_annual reports vs. annual reports + other sources_2022

Index	ENV	SOC	HUM	GOV	EMP	COR	SDG
% of occurrence / annual reports + other sources	96,23%	83,02%	49,06%	64,15%	94,34%	54,72%	47,17%
% of occurrence / annual reports	94,12%	62,75%	9,80%	39,22%	94,12%	17,65%	15,69%
% of occurrence / other sources	2,11%	20,27%	39,26%	24,93%	0,22%	37,07%	31,48%

Source: own elaboration

The *information* (or its part) related to environmental matters (ENV) and employee matters is almost in all annual reports of the monitored sample. In contrast, other sources supplement *information* (or its part) related to other matters (ca from 20% - 40%).

4.2 NFI disclosure quality vs. company size

As proposed in Chapter 3, Data and Methods, the linear correlation between NFII and CSI was calculated using the Pearson correlation coefficient (r) to test hypothesis H1 linked to the research question RQ2. The result, including the correlation coefficient (r) between the sub-indexes of NFII and CSI is presented in Table 5 below.

Table 5. Correlation coefficient (r)

Index	ENV	SOC	HUM	GOV	EMP	COR	SDG	NFII
Correlation coefficient (r)	0.215	0.108	0.095	0.102	-0.002	-0,045	-0.158	0.263

Source: own elaboration

The correlation coefficient (r) between NFII and CSI is 0.263, the correlation coefficients (r) between NFII's sub-indexes and CSI range from -0.158 to 0.215. The results show a positive correlation between the quality of NFI disclosure (NFII) and the company size (CSI). However, using the guide that Evans (1996) suggests for the absolute value of r : (0.00 – 0.19 = very weak), (0.20 – 0.39 = weak), (0.40 – 0.59 = moderate), (0.60 – 0.79 = strong), and (0.80 – 1.00 = very strong), it must be specified that this is a weak correlation. This indicates that as the size of the company increases, there is a tendency for the quality of non-financial information disclosed to increase. However, the strength of this association is not strong. A significance t-test for correlation was conducted with the following result to evaluate whether this correlation coefficient is statistically significant.

$$t = r \sqrt{\frac{n-2}{1-r^2}} = 0.263 \sqrt{\frac{53-2}{1-0.263^2}} = 1.947$$

Where:

- r is the correlation coefficient
- n is the number of pairs of data (= the number of companies)

Based on the publicly available Student's t table for two-tailed tests, for 51 degrees of freedom at a 95% confidence level, the critical t -value is ± 2.01 . The calculated t -statistic $t=1.956$ is less than the critical t -value $|t|=2.01$. Because the absolute value of the t -statistic does not exceed the critical t -value, the result is not statistically significant at the 95% confidence level. Therefore, **the null hypothesis (H0) cannot be rejected.**

5. Discussion

Results related to research question **RQ1** “*What is the quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD?*”, can be interpreted as follows.

The quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 does not meet the quality envisaged by the CSRD. Specifically, the mean score of the non-financial information index (NFII) used for the expression of the level of the quality of the NFI disclosed by the companies in the selected sample reaches 44.92%, whereby the median of NFII is 35.71%. This can be further interpreted in the way that the quality of NFI disclosure of 50% of the companies in the selected sample does not exceed ca 1/3 of the quality envisaged by the CSRD.

Comparing the results with similar studies in this research area is burdened by time and location specificities such as country of origin, data source, sample size, business sector, etc. However, authors such as Alkayed & Omar (2023) achieved similar results using similar methodologies. They analysed the extent and quality of NFI disclosed in the annual reports of 118 Jordanian companies between 2010 and 2015, concluding that the average extent of disclosure was found to be 53.5% and the average quality corresponds to 37.85%. Since this paper assesses both extent and quality together, the results are fully comparable in terms of figures. Even though this is a result obtained at a different time, in a different country (even not from the EU), with companies without a focus on the energy sector, this can be understood as a confirmation of the general validity of Kolk's statement (2010) that companies are somewhat reluctant to include non-financial aspects in their reports.

For a more relevant comparison, the study by (Glášerová et al., 2024) can be considered. Their study assesses the level of non-financial reporting by groups of banks in the Czech Republic in 2016 and 2021, with both companies subject to mandatory reporting and companies not subject to mandatory reporting in the sample. Considering the 2021 results, with the group of banks already subject to EU mandatory reporting (NFRD), together with large banks not yet subject to compulsory reporting but with the potential to fall under the new CSRD, which is closest to the conditions of this paper, the unweighted average level of non-financial reporting is 42.71%. Thus, the result is again fully comparable to the result of this paper.

Also, another study in this area by Hategan et al. (2021), evaluating the mandatory non-financial reporting of Romanian companies operating in the non-financial sector for the period 2017-2019, a study comparable to this article, reached a similar result, with an average score of 47.60% for the companies surveyed.

Regarding the influence of NFI in sources other than annual reports on the quality of disclosed NFI, which is not in line with the approach envisaged by the transposition of the CSRD into Czech legislation., the findings indicate a relatively significant influence. On average, 22.19% of the information needed to assess the quality of published NFIs was found in sources other than annual reports. This can be partially compared with the finding of Hategan et al. (2021), according to which about 45% of companies have CSR activities listed on their websites. However, it is not entirely clear from their study whether the information on CSR activities in the annual report available on the website is considered information from the annual report or the website (another source). In general, however, the fact that the information exists is considered more important than the source where the information can be found.

Regarding the research question **RQ2** “*What is the relationship between the quality of the non-financial reporting and the size of the company?*” the results show a positive association between the quality of NFI disclosure and the size of the company, but not statistically significant. Based on the data and the confidence level selected, there isn't enough statistical evidence to conclude that a larger company size correlates with better or higher quality of NFI disclosures, as proposed by the alternative hypothesis.

This result is partially consistent with Radu et al. (2023). They identified positive correlations between the quality of disclosed NFI and selected parameters characterising firm size (e.g., total costs, total revenues, number of employees, and total assets) from weak to strong. The different results could be justified because

they used a different methodology to calculate separate correlations between the quality of disclosed NFI and individually selected parameters characterising firm size. Furthermore, they did not test the statistical significance of correlations, so the result is only partially comparable.

6. Conclusions

This article aimed to answer the question of what is the level of quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to fall under mandatory NFR under the CSRD from 2025, compared to the level of quality envisaged by CSRD, and whether there is some correlation between the quality of this NFI disclosure and the size of the company.

To meet this aim, it was necessary to (i) translate the aim into specific research questions and related hypotheses, (ii) conduct a detailed literature search focusing on areas related to the research questions; (iii) develop a process for identifying companies that have the potential to fall under the mandatory NFR under the CSRD from 2025; (iv) develop a methodology for data collection and processing, including identification of data sources; (v) collect and process the data to obtain results relevant to the research questions and to test the defined hypothesis; and (vi) transfer the result, the answers to the given research questions, to specific findings that answer the question and confirm or refutes the hypothesis defined within the aim of this paper.

Specifically, after a detailed literature search, an initial sample of 135 companies from the Czech energy sector (or from other sectors with different core activities but providing energy-related services to a considerable extent) was defined using the proposed key, which was narrowed down to a final sample of 53 companies based on the established criteria. Data from these companies were selected using the chosen data collection method and processed according to the developed methodology. This led to results that fully answered the research questions and confirmed the defined hypothesis. As a final step in the process described above, these results are translated into the following findings:

(i) The quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to fall under mandatory NFR under the CSRD from 2025 is insufficient, reaching approximately 45% of the quality envisaged by CSRD.

More specifically, only 2 of the 53 companies in the final sample have an NFR at the level expected by the CSRD, i.e. including its inclusion in the annual report, thus fully in line with the approach envisaged by the transposition of the CSRD into Czech legislation. 18 other companies achieved a similar level of NFR quality, but this was based on information from other sources. The rest of the companies disclose NFI of quality significantly below the level expected by the CSRD. However, it should be stressed that such a statement does not imply any criticism of this state of affairs. Indeed, most of the companies in the sample are not yet required to disclose NFIs at all or only to a very limited extent. On the contrary, the result can even be presented positively, in that some companies are already almost at the level expected by future legislation in terms of non-financial reporting.

(ii) A positive correlation between the quality of this NFI disclosure and company size was identified but not confirmed as statistically significant.

In view of the above, it can be concluded that the aim of this paper has been fulfilled in its entirety. However, certain limitations should be mentioned.

The first limitation relates to the results' validity or general applicability. Although the results of this study are comparable to those of other researchers in a similar area of research, they are subject to local and temporal specificities. However, this is due to the focus of this work and cannot be considered a deficiency. The second limitation is the objectivity of the results of converting qualitative data into quantitative indicators. However, this could easily be addressed, e.g. in a follow-up study, by involving another researcher or researchers to verify the results of converting qualitative data into quantitative indicators.

In terms of further research in this area, the findings of this paper could be confirmed by involving other researchers in the data collection process. A longitudinal study could also be considered once new annual reports are available from 2023 onwards, focusing on researching published NFIs' quality trends. And, of course, the research could be further expanded either in terms of a sample that would include other industries from other EU countries or in terms of focusing on what else besides company size might have some influence on the quality of disclosed NFI (e.g. board characteristics, financial performance, external audit, etc.), or what the relationship is between the quality of disclosed NFI and CSR performance. These areas have already been the subject of studies or other researchers, but almost always with some limitations (local and temporal specificities, sample size or one-sidedness, etc.) and given the urgency of the topic, objectification of the findings is desirable.

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