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# The Involvement of Real Estate Companies in Sustainable Development—An Analysis from the SDGs Reporting Perspective

Elena Ionaşcu <sup>1,\*</sup>, Marilena Mironiuc <sup>2</sup>, Ion Anghel <sup>3</sup> and Maria Carmen Huian <sup>2</sup>

<sup>1</sup> Doctoral School of Economics and Business Administration, Faculty of Economics and Business Administration, “Alexandru Ioan Cuza” University of Iaşi, 14 Lapusneanu Street, Building R, 700057 Iaşi, Romania

<sup>2</sup> Accounting, Business Information Systems and Statistics Department, Faculty of Economics and Business Administration, “Alexandru Ioan Cuza” University of Iaşi, 22 Carol I Boulevard, Building B, 700505 Iaşi, Romania; marilena@uaic.ro (M.M.); maria.huian@uaic.ro (M.C.H.)

<sup>3</sup> Department of Financial and Economic Analysis, Faculty of Accounting and Management Information Systems, The Bucharest University of Economic Studies, 6 Piata Romana Street, 010374 Bucharest, Romania; ion.anghel@cig.ase.ro

\* Correspondence: elena.ionascu.a@gmail.com

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**Abstract:** As transparency has become the new paradigm of economic activities, we set out to analyse the extent to which the EU real estate companies legitimise their role in society through the sustainable development goals (SDGs) while meeting stakeholders’ information needs. Applying the content analysis, the sustainability reports and the annual reports of the entities from the real estate sector, from 2016 to 2018, were studied in order to highlight the priority SDGs of the field and the extent to which they are integrated in their business models. In addition, we evaluated, based on a quality score, the depth with which the entities report their sustainability commitments. The results of the study show that although more and more real estate entities are expressing their interest for sustainable development, there is still a large gap between the assumed intentions and the real actions undertaken by the companies. Most of them do not have the strategy, culture and tools needed to turn sustainability commitments into concrete actions. According to the average quality score (2.99 out of 5), the entities present their sustainability aspirations mostly qualitatively and report few quantitative key performance indicators (KPIs) to reveal the degree of achievement of the priority SDGs, such as: SDG 11—Sustainable cities and communities, SDG 13—Climate action and SDG 8—Decent work and economic growth.

**Keywords:** real estate; sustainable development goals (SDGs); sustainability reporting; transparency; content analysis

## 1. Introduction

The 17 sustainable development goals (SDGs) of the 2030 Agenda form a coherent and integrated framework for addressing the most urgent global sustainability issues, the solution of which depends on the joint efforts of all individuals, organisations and governments. Thus, the dynamic problems of sustainable development determine the new perspectives of corporate reporting, increasingly emphasising the role of the business environment in designing and implementing the sustainability objectives [1]. In this respect, entities are encouraged to align their values with those of the community in which they operate [2], and because transparency has become the new paradigm of economic activities [1,3], companies must legitimise their role in society through concrete actions while meeting

the information needs of stakeholders [4]. As a result, more and more entities are integrating SDGs into their business models, annually reporting on their progress. Blasco and King [5] show that, in general, the top companies have strongly resonated with the sustainability objectives in less than two years since their launch, suggesting the increased interest of the entities for reporting according to the SDGs. However, there is still a large gap between entities' good intentions and their ability to incorporate SDGs into their own business strategy [6].

The application of the sustainability criteria is a real challenge for the active companies in the real estate domain, these being important benchmarks for both the construction of the sustainable buildings and for the profitable real estate investments. Due to the nature of its core operations, the real estate sector has the capacity to contribute to the attainment of all SDGs [7,8]. Because of the major impact of buildings on the environment (the real estate sector consumes over 40% of the global energy annually, 30% of the raw materials and 12% of the drinking water, generating 25%–40% of the solid waste and 20% of the total gas emissions), the environmental objectives have been included as a priority in the strategies of several European real estate companies [9,10]. However, further efforts are needed to reach the United Nations (UN) targets on climate change, as the real estate sector is outperformed by other economic sectors in managing environmental sustainability challenges [11,12]. In addition, the real estate industry is recognised for its slow response and reduced contribution to sustainable development [13,14]. Regarding the economic, social and institutional dimensions of sustainability, the real contribution of the real estate field to the development of local communities is reduced or at least weakly promoted in the public space.

Given the need for clear actions to achieve the SDGs, we ask ourselves the following question: what is the real contribution of the real estate sector to sustainable development? In the context of current and future challenges and given the fact that sustainability reports (SRs) (given that some companies include non-financial information in their annual reports, while others prepare special sustainability/corporate responsibility or integrated reports, from here on, through "sustainability reports" (SRs), we refer to all types of reports that include information about sustainability) represent the main platforms for communicating sustainability values to stakeholders [4,15,16], we set out to analyse the participation of the EU real estate companies in sustainable development. Over time, Europe has given more importance to sustainability issues than other regions of the world. In this regard, the EU institutions have played a decisive role in promoting non-financial reporting practices [17]. With the transposition of Directive 2014/95/EU into the legislations of Member States, the EU has become an example of good practice for the rest of the world, harnessing the "power of transparency" in order to create economic, social, institutional and environmental benefits [18]. The questions that have guided us in achieving the research objective are: How involved are the real estate companies in sustainable development? How many companies in the field have chosen to report on the contribution of their activities to the SDGs? What are the priority goals of the real estate industry and how do entities contribute to their achievement? How many companies understand that the SDGs are more than the elements of sustainability and need to be integrated into the overall business strategy? By identifying the answers to these questions, the results of the research will allow us to appreciate the level of the SDGs' insertion into the field practice.

Next, Section 1 presents a review of the literature on sustainable real estate reporting, Section 2 describes the methodological approach of the paper and Section 3 includes the results and discussions of the research, followed by the final conclusions.

## 2. Sustainable Reporting in the Real Estate Field

Corporate social responsibility (CSR)/sustainability reports are a transparent way of communicating significant information to stakeholders about the performance and the impact of environmental actions, the social responsibility, the economic prosperity, the corporate governance and the institutional partnerships. This way, corporate social responsibility (CSR) becomes the interface between business and society [19,20], which ensures sustainable development. By requesting the

entities to provide detailed information about their actions of responsibility, investors are a major contributing force to sustainable development [21].

Sustainable reporting also offers new opportunities for corporate sustainability of the real estate sector [22]. Corporate responsibility is synonymous with responsible real estate investments, which reveal the implications of sustainability for real estate development and corporate responsibility strategies [23]. In order to ensure transparency, companies should adopt an integrated approach in managing the data and information specific to their main activity at all levels of the entity [8]. This can be achieved by implementing corporate real estate sustainability management (CRESM) that integrates the economic, social, environmental and institutional aspects of real estate companies [8]. Transparency in environmental reporting refers to the presentation of the actions and the efficiency of the measures taken to monitor and reduce the ecological footprint of the asset portfolio. Regarding social equity, companies must report, in a transparent manner, the quality of relationships with stakeholders and the direct social impact of their activities. Corporate governance, a component of the institutional transparency, aims at presenting the policies and principles that govern the activity of the entity. Transparent reporting of the economic dimension implies the presentation in a standardised and faithful manner of the financial position and performance, through a set of indicators relevant to the decisions of the subjects in relation to the company [24].

Considering the interventions of the various stakeholders during the life cycle of a building and the poor communication between them, in order to increase the transparency of the information flow from one phase to another, it is important that the real estate companies communicate the elements contributing to the creation of the value of the real estate property. Integrated reporting that inspires more and more real estate business models, adapted to the continuously dynamic socio-economic environment, can contribute to this objective. Integrated reports serve companies to explain how the strategy, governance, resources, performance and outlook of the external environment contribute to creating value in the short-, medium- and long-term [25]. A study by Deloitte [26] shows that entities in the real estate industry constantly perform in adopting the elements of integrated reporting. One explanation for this is the large exposure of the industry to the current global trends determined by the new technologies and the change of regulations.

Due to the voluntary nature of sustainability performance reporting, real estate companies are facing a lack of a standardised approach of the informational content of sustainability reports [11]. To eliminate this problem of real estate reporting, bodies such as the Carbon Disclosure Project (CDP), European Association for Investors in Non-Listed Real Estate Vehicles (INREV), European Public Real Estate Association (EPRA), Global Reporting Initiative (GRI) and Global Real Estate Sustainability Benchmark (GRESB) propose standardised but voluntary frameworks for presenting sustainability information.

The EPRA and INREV, coordinating the activity of real estate investments at a European level, have contributed to revolutionising the transparency of information on real estate performance. Therefore, they are recognised as important institutions for the internationalisation of the European real estate markets [27]. Equally important is the role of rating agencies, such as the GRESB, in increasing the quality of information related to the sustainability of real estate development [27]. Meanwhile, GRI and CDP are organisations that build guidelines for preparing and presenting non-financial information for all industries, but also offer specialised recommendations on industrial segments.

By adopting the Directive 2014/95/EU, the EU Member States impose non-financial reporting obligations on all public interest companies, with over 500 employees, including real estate companies, whose securities are traded on the stock exchange. The Directive gives companies the flexibility to publish relevant sustainability information, giving them the opportunity to choose between international, European or national standards. As a recommendation, the European Commission refers to the reporting framework proposed by the UN Global Compact initiative, which calls on companies to align their strategies and operations with the universal principles of human rights, labour, environment and anti-corruption, and to propose innovative measures to achieve the SDGs [28].

In this way, the 17 SDGs offer businesses a new framework for translating global needs and ambitions into business solutions [29] and new tools for managing current environmental, social and economic challenges [6].

Increased European policies on sustainability explain the increase in the number of real estate companies that engage in sustainability practices [11]. In general, researchers believe that businesses operating in industries heavily impacted by sustainability regulations are more involved in the CSR reporting [30]. The construction sector is the largest energy consumer in the EU because 75% of the buildings of the EU states are characterised by energy inefficiency, and in order to develop a climate-neutral, long-term economy, a set of modern and reconditioned buildings is needed [31]. In order to increase the energy performance and decarbonisation of buildings, the EU has established a legislative framework through the Directive 2018/844/EU, which provides for long-term, ambitious commitments, such as: reducing greenhouse gas emissions by at least 40% by 2030, increasing the share of energy consumption from renewable sources and transforming the existing buildings into nearly zero-energy buildings. The transposition of the directive by the Member States by March 2020 will have a strong impact on the future of the European construction industry, as real estate companies will have to adapt their technological process to climate actions. Research conducted by the GRESB [32] shows that in 2018, only 2 of 903 companies from 64 countries report portfolios of real estate assets with zero energy consumption, obtained by using renewable energy and carbon offsetting operations. The study also states that more and more companies are setting internal goals for achieving zero emission performance, demonstrated by building certification.

The new building standardisation, evaluation and certification programs contribute to the guidance, demonstration and documentation of the efforts to provide sustainable and high-performance buildings. The certificates of the buildings issued by the rating agencies have become important sources of information for potential buyers and tenants. They provide credible signals about the performance of a building, thus contributing to reducing information asymmetry in the commercial real estate industry. Empirical evidence shows that reporting information through environmental certificates helps to increase the financial performance of commercial real estate [33]. Thus, sustainable development may be achieved through the implementation and the application of the sustainable building assessment tools ([34], (p. 120)).

Although the interest of real estate companies in reporting non-financial information is increasing, research on the reporting modalities practiced by these companies is very limited. Rashidfarokhi et al. [11], reviewing the existing studies, highlight the following conclusion: in the field of sustainable reporting, the real estate sector is overtaken by the other sectors. In addition, there is no consistent approach regarding the standardised publication of non-financial information, information about auditing and stakeholder involvement, and information on environmental performance is most commonly reported by the European real estate companies.

### 3. Methodological Approach to Content Analysis

The research method used to assess the extent to which real estate companies participate in the development of sustainability is content analysis. This method is very popular among researchers due to its flexibility of use and systematic structure [16,35,36]. Content analysis is frequently applied in exploring the annual and sustainability reports of companies [16,37,38]. Given the limited literature on sustainable real estate reporting [11], according to the recommendations of Elo and Kungäs [39], qualitative content analysis was applied, based on an interpretative–inductive, epistemological approach. According to this type of analysis, the research questions guide the collection and analysis of the data [40]. The logic of the content analysis design is shown in Figure 1 [37,40].

Based on the research questions formulated in the introduction of the research, the methodology comprises the following stages: defining the sample, choosing the analysis method, describing the coding system and interpreting the results.



**Figure 1.** The logic of designing content analysis. “Research questions” are presented in the introduction section, “Analysed sample” is defined in the “Sample definition” section, the “Analysis method” and “Coding system” are presented in the “Content analysis process and coding system” section and “Interpretation of results” in the “Results and discussions regarding SDGs reporting” section. Source: own representation. 3.1. Sample Definition.

### 3.1. Sample Definition

In order to avoid the problems caused by the inconsistency of the documents [41], the sample of reports is extracted from a single source, namely from the extended database provided by the GRI. This includes over 56,000 published SRs since 1999, of which almost 60% are in compliance with the GRI [42]. The large number of reports prepared according to the methodology proposed by the GRI confirms the opinions of many researchers and institutions regarding the wide applicability of the GRI standards in sustainable reporting worldwide [4,5,43]. In addition, the database provides information on compliance with other reporting frameworks (for example: Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, UN Global Compact and its principles, Carbon Disclosure Project (CDP), International Finance Corporation (IFC) Performance Standards, International Organization for Standardization (ISO) 26000, UN Sustainable Development Goals (SDGs)) and external information assurance (for example: purpose of insurance, provider, level of insurance, standards insurance used, etc.).

In order to appreciate the extent to which the EU real estate entities contribute to the achievement of the 17 SDGs, the reports published from 2016 onwards, 2016 being the first reporting year after the SDGs’ adoption, were extracted from the GRI database. As a result, 124 reports from 78 real estate companies remained. Given the main objective of the study, only the reports referring to the SDGs were selected from the initial sample, namely, 41 reports issued by 18 entities (23% of the initial number of real estate companies). Of these, two entities from Finland and Sweden were eliminated because their sustainability reports for the financial year of 2016 are not published in English. The final sample consists of 39 observations from 16 real estate entities headquartered in Western EU countries (see Appendix A), which highlights the poor illustration of the SDGs in real estate.

Sweden is the leader in reporting according to the SDGs, being represented in the sample by 6 real estate entities with 17 SRs. Belgium comes second with 2 entities and 5 SRs, followed by Finland (3 SRs), France (3 SRs), Great Britain (3 SRs), Germany (2 SRs), The Netherlands (2 SRs), Portugal (2 SRs) and Austria (1 SR) and Greece (1 SR), with one entity each. Even though sustainability practices often vary between countries [44], the GRI, our data source, “provides a unified standard for sustainability reporting” that “allows us to compare information and engage in benchmarking between various organisations” and over time [16] (p. 1473). Of these extracted entities, 10 are real estate owners and developers, and 6 are organised as real estate investment trusts (REITs). All entities have majority private equity and are listed on the stock exchange, except two entities located in Finland and Sweden that are state-owned. In terms of size, large entities (10) prevail, multinationals and small and medium-sized enterprises (SMEs) being represented by 3 entities.

Based on their core operations, most companies develop commercial spaces, office buildings, logistical centres and houses for sale or rent which, in 2018, generated an average turnover of EUR 706.63 million. For most of the companies, over 90% of the revenues come from the rental of real estate assets held in order to produce income from rents and/or the appreciation of the invested capital. Such properties are accounted for in accordance with IAS 40 *Investment property* in the real estate investment account, whose average value in 2018 was equal to EUR 4196.67 million for normal real estate entities and EUR 7279.08 million for REITs. In these companies, the real estate investments weigh more than 95% of the total fixed assets and they have an average occupancy rate of almost 100%.

### 3.2. Content Analysis Process and Coding System

The selected SRs' content was studied using content analysis based on a coding system. As this method provides the researcher with flexibility in structuring the analysis process [16,45], the stages of the analysis were designed to allow for the identification of the answers to the research questions. One of the requirements of this analysis is the repeated reading of the documents for a higher knowledge of the data [45]. Initially, the SRs were read in their entirety in order to form an overview of the documents and to identify the sections dedicated to the SDGs. Subsequently, the sections thus delimited were read several times to correlate the text of the reports with the established codes. Based on these considerations, the analysis process consisted of completing the steps presented in Table 1, using the conventional and coordinated content analysis, proposed by Hsieh and Shannon [45].

**Table 1.** Stages of the analysis process of the contents of sustainability reports.

	<b>Stage 1. Generalities about the Studied SRs</b>
<b>Conventional Approach</b>	(a) Type, structure and dimension of the SRs (b) The reporting framework used (c) Independent external insurance
	<b>Stage 2. Reporting Regarding SDGs</b>
<b>Coordinated Approach</b>	(a) Reporting modalities (b) Prioritising objectives (c) Assessment of the reporting quality (d) Contributions to SDGs achievement

Source: own representation. SRs—sustainability reports; SDGs—Sustainable Development Goals.

At the completion of the first stage, the conventional approach of content analysis was applied, the main purpose of which was to describe a certain phenomenon based on the texts studied [45]. At the first reading, information extracted from the SRs regarded: the type, structure, size, reporting frameworks and independent external insurance. This helped to outline an overview of the documents studied.

In the first part of the second stage, the relevance of the SDGs was studied for defining the strategy, carrying out current operations and the involvement of stakeholders. Subsequently, the priority goals of the real estate entities were identified and evaluated according to the quality of the reporting. One may assume that frequency indicates the importance of the subject matter [46]. But, as the sustainability reporting research states that the quantity of disclosure does not indicate what is actually being disclosed [47], we examined both the amount of disclosure and the quality of the data disclosed. Examining the relative emphasis on each theme and the location of reported information is the approach most likely to study the quality of reporting and to yield meaningful results [47]. In this respect, a coordinated approach of the content analysis, aimed at coding text based on a system of categories and codes, was applied. This system was initially established according to the literature recommendations, and later on, it was supplemented with new codes imposed by the information revealed by the reading [45]. The NVivo qualitative data processing software (version 12) was used to organise the coding system.

In order to increase the reliability of the qualitative data analysis, the categories and the related codes were selected according to well-founded literature [11,48]. Several authors [46,47] consider selecting disclosure categories and codes from well-grounded relevant literature as an efficient method to increase the reliability in recording and analysing data. Thus, the categories are represented by the 17 SDGs, and the corresponding codes are built according to the targets set by the UN for each goal and customised for the real estate field. When formulating the codes, the GRI and UN Global Compact [49] recommendations regarding the prioritisation of SDGs by entities according to the risks and benefits for society and the environment were also taken into account. Therefore, the codes were correlated with the real estate specificity, depending on the development of the land, the use of resources, the production of waste and the working practices throughout the life cycle of real estate [8].

For example, the SDG 7—Affordable and clean energy was represented by two codes—energy efficiency and renewable energy, as the key objective of the energy union strategy, were adopted in 2015 by the EU to facilitate the transition from fossil fuels towards cleaner energy and to reduce the greenhouse gas emissions [50]. As buildings are the single largest energy consumer in Europe, by improving energy performance of buildings, the EU can more readily achieve its energy and climate goals [50]. Therefore, the role of the real estate sector in achieving SDG 7 is crucial and we would expect entities to prioritise this goal. Following the study of the sections dedicated to SDG 7, all qualitative and quantitative information related to energy efficiency and renewable energy was recorded in the corresponding codes created in NVivo.

Another goal that we expected to be frequently reported by the real estate entities was SDG 11—Sustainable cities and communities, whose targets are orientated towards the construction of cities and human settlements which are inclusive, safe, resilient and sustainable. In order to appreciate the engagement of the real estate entities with this goal, the qualitative and quantitative information was coded, sentence by sentence, in the following codes: construction of safe, accessible and decent housing and workspaces, projects for inclusive and sustainable urbanisation, efforts to protect the cultural and natural heritage and ensuring access to inclusive and sustainable public green spaces. These codes correspond to the targets 11.1, 11.3, 11.4 and 11.7 of the SDG 11, agreed upon by the UN members [51].

The codes of the other goals of the 2030 Agenda were designed according to the same logic based on literature as the SDGs 7 and 11, explained above (see Appendix B). As several authors recognise that the environmental sustainability performance is the most common type of information reported by the real estate entities in Europe [11], we expect the goals related to clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), responsible consumption and production (SDG 12) and climate action (SDG 13) to be mostly integrated in the strategies of the real estate entities.

As we mentioned earlier that the quantity of disclosure does not indicate what is actually being disclosed [52], we also assessed the quality of the SDGs reporting. To determine the quality of the SDGs reporting prioritised by real estate entities, the goals were evaluated by a score from 1 to 5 [6,53], where:

1. The entity declares the importance of the SDGs, but without including certain aspirations.
2. The entity declares the importance of the SDGs and includes qualitative aspirations for achieving them.
3. The entity identifies quantitative key performance indicators (KPIs) for the relevant SDGs.
4. The entity identifies KPIs and quantitative targets for the relevant SDGs.
5. The entity correlates KPIs assigned priority SDGs with the impact on the company.

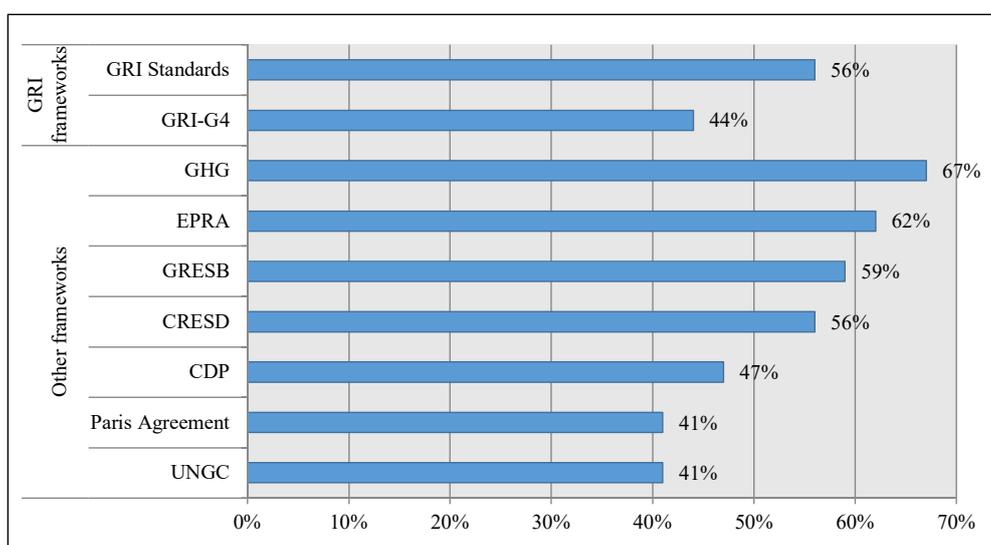
## 4. Results and Discussions Regarding SDGs Reporting

### 4.1. Results of Stage 1: Generalities about the Studied SRs

The studied reports differ depending on the type, structure and size, because each entity presents its sustainability information in a personalised way, according to its own business model, which affects the comparability of the information. In 14 of the 39 SRs studied, the information on corporate responsibility is presented in separate reports, the rest of the SRs include it in the annual reports alongside financial statements. In 84% of the annual reports, real estate entities integrate financial and non-financial information in order to demonstrate how they create short-, medium- and long-term value for stakeholders. As integrated reports are important sources of information for the stakeholders involved in the life cycle of real estate, real estate entities' interest in adopting integrated reporting elements is growing steadily [26] as evidenced by the fact that 81% of the integrated reports analysed refer to the most recent financial years (2017 and 2018).

From the point of view of the volumetric sustainability disclosure [54], entities present information on CSR, on average, in approximately 105 pages. Considering that the size of the reports without financial statements ranges from 36 pages to 183 pages, this number (105) illustrates different levels of sustainability communication [55]. In terms of general structure, the SRs start with the message of the

executive director and continue with the presentation of the profile of the entity, main results, strategy, business model, mission, values, dialogue with stakeholders, economic, social and environmental priorities and corporate governance. They generally end with the correspondence between the published information and the requirements of the applied reporting framework. The order of presenting this information differs from one report to another, depending on the entities' experience in non-financial reporting. Currently, technological innovations offer entities new creative solutions for impact presentation of the whole "story", such as: improved accessibility of information through hyperlinks, online tools that allow the selection of relevant sections for stakeholders, integration of interactive functions to energize information graphics, insertion of short videos, etc. [56]. The use of digital instruments by real estate entities is relatively limited, as external submissions are accessible with a single click in only 51% of the studied SRs and the internal references and inserted markers are active in only 23% of the SRs (Figure 2).



**Figure 2.** Sustainable reporting frameworks used by real estate entities. Source: own representation based on reports analysis. GRI Standards—Global Reporting Initiative (GRI) Sustainability Reporting Standards; GRI-G4—G4 Sustainability Reporting Guidelines (the fourth generation of the GRI Guidelines); GHG—Greenhouse Gas Protocol; EPRA—European Public Real Estate Association; GRESB—Global Real Estate Sustainability Benchmark; CRESB—Construction and Real Estate Sector Disclosures in accordance with the G4 Guidelines; CDP—Carbon Disclosure Project; UNGC—United Nations Global Compact.

All the reports of the analysed real estate entities comply with the requirements on the disclosure of information defined by the GRI Standards for sustainability reporting, for the "in accordance-core" option. Forty-four percent of the SRs were compiled using the GRI-G4 guide, most of them in 2016 (11 SRs), and 56% were prepared according to the new GRI standards (2016: 2 SRs, 2017: 10 SRs and 2018: 10 SRs) (Figure 2). The fact that all SRs analysed are compiled using GRI guidelines and standards reduces the problems related to heterogeneity, thus increasing the data comparability [16]. In preparing 56% of the SRs, the entities also took into account the recommendations of the GRI-G4 guide specific to the sector of construction and real estate (CRESB—Construction and Real Estate Sector Disclosures), although this has become optional since the adoption of the GRI standards. In 41% of the SRs, the entities expressed their commitment to respect the 10 principles of the UN Global Compact (UNGC) regarding human rights, labour standards, environment and anti-corruption.

Many of the real estate entities, especially the listed ones, present sustainability information according to the standards of representative institutions in the field, such as EPRA and GRESB (Figure 2). Thus, in 62% of the SRs, real estate companies calculate and report environmental,

social and governance performance indicators according to the EPRA Sustainability Best Practices Recommendations Guidelines methodology. In 59% of the SRs, the entities declare their agreement to participate in the GRESB survey on the evaluation of the portfolios of real estate assets according to the dimensions of sustainability. In addition, to demonstrate the efficiency of the measures to reduce the impact of real estate investments on the environment, companies publish detailed quantitative information on: the sources of greenhouse gas (GHG) emissions according to the GHG Protocol standard (67% of the SRs), the environmental risk according to the CDP (47% of SRs) and the contribution to the Paris Agreement on limiting global warming to 2 °C (41% of SRs).

In order to increase the confidence of stakeholders in the credibility, completeness and significance of the sustainability information, more and more real estate entities resort to an external assurance provider: 72% of the studied SRs include the declaration of an external auditor. Because external insurance is an indicator of legitimacy and commitment to sustainable development [57,58], the auditor's independence and expertise, the purpose of the mission, the expressed opinion and the assurance standards are considered important aspects of reporting credibility [38,59]. In 89% of the audited reports, the insurance missions were carried out by the experts of the "Big Four", but in most cases (54%), their purpose was to express opinions regarding certain sections of SRs and not on the full report. Most SRs have a limited level of assurance according to the International Standard for Insurance Missions (ISAE 3000) (89% of cases) and/or national assurance standards (25% of cases). These findings match the results obtained by Jones et al. [60] following the analysis of the sustainability reports of the vast majority of Europe's leading property companies. The authors stress that the "limited" external assurance reduces the reliability and credibility of the European property companies' sustainability reports, but looking to the future, "growing stakeholder pressure may force leading property companies to [ . . . ] commission more comprehensive external assurance as systematic and integral elements in the reporting process" [60] (p. 165).

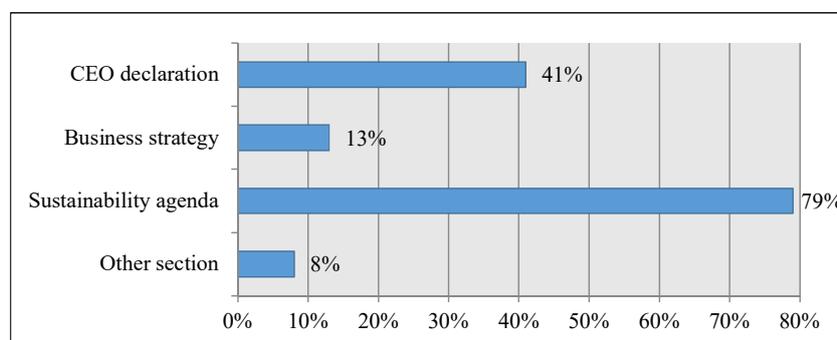
Following the analysis of the reports according to their characteristics (type, size, structure, reporting frameworks, external insurance), we can conclude that there is a moderate level of transparency of information on corporate responsibility in the real estate field. The average utilisation rate of auxiliary reporting frameworks, equal to 53%, indicates the relatively low involvement of the EU real estate companies in sustainable development.

#### 4.2. Results of Stage 2: Reporting over SDGs

Eleven of the 16 entities analysed chose to mention, from the first reporting year after the UN targets were set, the SDGs that correlated the best with their activity. Most of them continued this practice in the following years. These results highlight the receptivity of the real estate domain to the global problems of sustainability. However, in only 41% of the studied reports, the CEO communicates the relevance of the SDGs for the business and society (Figure 3). The lack of mention of the SDGs in the discourse of the executive directors could be a signal of the weak integration of the goals in the overall strategy of the entity [6], a fact confirmed by the very low rate (13%) of the reports in which the entities describe their role in their business model. Therefore, we assume that the SDGs are, to certain extent, adopted at a declarative level and are not necessarily materialised in actions generating valuable effects for the sustainable development. The SDGs are mentioned mainly in the sections dedicated to the sustainability agenda (79%), whose presentation is not correlated with the rest of the content of the report (54% of cases).

The real estate entities give priority, on average, to 8 of the 17 SDGs (Table 2), which means that more than half of the goals are neglected by them. However, the number of goals chosen varies widely from one entity to another, the standard deviation being 4.57. While some entities only discuss the relevance of the objectives (5%), without referring to a particular SDG, others communicate about all SDGs (7.7%), highlighting the contribution of their activity to achieving the goals. This situation is characteristic of most fields of activity (energy, utilities and mining, financial services, industrial products, retail and consumer, technology, media and telecoms, transport and logistics), as shown

by the results of the study conducted by PricewaterhouseCoopers (PwC) [6,53]. In order to present the relevant goals, the companies allocate, on average, about 17 pages of the report, which represent 14.14% of the SR (1.85 pages/SDG), to describe how they support the achievement of the SDGs.



**Figure 3.** The sections of the sustainability reports in which the SDGs are mentioned. Source: own representation based on reports analysis.

**Table 2.** Descriptive statistics on SDGs reporting.

Variable	Observations	Mean	Standard Deviation	Min	Max
Number of SDGs reported	39	7.77	4.57	0	17
Number of pages dedicated to the SDGs	39	17.26	22.34	1	72
% SR dedicated to the SDGs	39	14.14	15.63	0.74	52.17
Pages/SDG	38	1.85	1.80	0.07	6.27

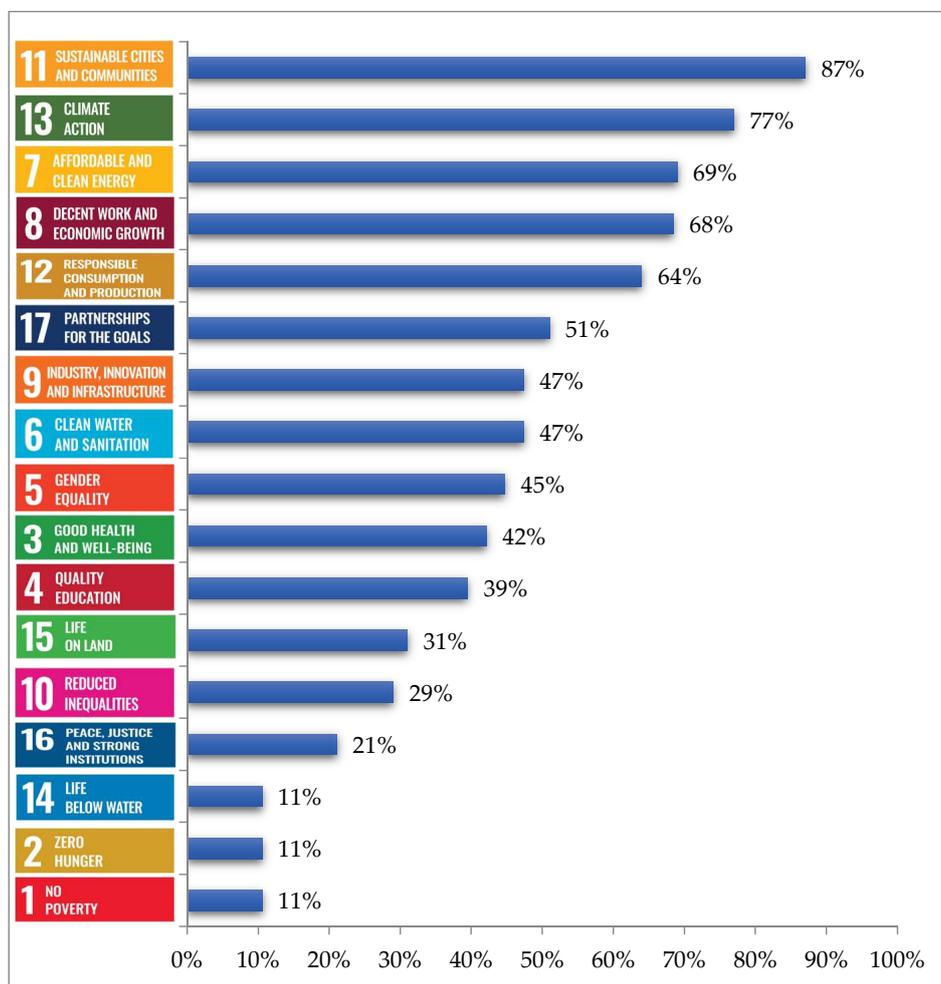
Source: own representation based on reports analysis.

SDG 11—Sustainable cities and communities (87%), SDG 13—Climate action (77%), SDG 7—Affordable and clean energy (69%), SDG 8—Decent work and economic growth (68%) and SDG 12—Responsible consumption and production (64%) are the goals most frequently prioritised by the real estate entities in the EU, while SDG 1—No poverty (11%), SDG 2—Zero hunger (11%) and SDG 14—Life below water (11%) occupy the last places in the priorities of real estate companies (Figure 4).

This ranking, which confirms our expectations, is the consequence of relating the field of activity to the specificity of each SDG rather than the result of an in-depth analysis of the role of economic activity on each goal [53]. In addition, the minimum SRs rate of 8%, in which there are references to the targets set by the UN, confirms the superficiality of the entities in setting the sustainability goals, since they are set at the SDG level and not at the target level. There is a clear alignment between the priority goals of the real estate entities and their business strategies, because they are already mature enough to adapt their portfolio of assets to the stakeholders' requirements in order to keep up with the expectations of the constantly changing society. In this context, we note the significant interest of the entities in engaging with stakeholders in various long-term partnerships to achieve the goals (e.g., SDG 17 is relevant in 51% of the SRs of the real estate business). Through such initiatives, businesses contribute to improving the level of communication throughout the life cycle of real estate.

When reporting on the SDGs, real estate entities tend toward qualitative rather than quantitative dissemination, as indicated by the average quality score equal to 2.99 out of 5 (Table 3). Many analysed companies identify quantitative KPIs but present their aspirations for sustainability in a qualitative way without correlating them with the impact on society. If, in 2017, the quality score increased by 15% compared to the previous year, in the following financial year, it registered a slight decrease of about 2%, highlighting the poor progress in terms of reporting the effects of real estate activities on sustainability. According to the analysis of variance (ANOVA), there are no statistically significant quality differences between listed and unlisted entities ( $F(1, 35) = 0.03$ ,  $p$ -value = 0.8744), between large, multinational entities and SMEs ( $F(2, 34) = 2.69$ ,  $p$ -value = 0.0823), between externally assured

and uninsured reports ( $F(1, 35) = 3.55, p\text{-value} = 0.0680$ ), and between the companies that carry out real estate activities in the normal regime and those of the type REITs ( $F(1, 35) = 0.08, p\text{-value} = 0.7791$ ). These results can be attributed to the voluntary nature of non-financial reporting and to the lack of convergence of sustainable reporting practices in the field.



**Figure 4.** Ranking of the SDGs based on the SRs issued by EU real estate entities. SDG 11—Sustainable cities and communities (87%), SDG 13—Climate action (77%), SDG 7—Affordable and clean energy (69%), SDG 8—Decent work and economic growth (68%), SDG 12—Responsible consumption and production (64%), SDG 17—Partnerships for the goals (51%), SDG 9—Industry, innovation and infrastructure (47%), SDG 6—Clean water and sanitation (47%), SDG 5—Gender equality (45%), SDG 3—Good health and well-being (42%), SDG 4—Quality education (39%), SDG 15—Life on land (31%), SDG 10—Reduced inequalities (29%), SDG 16—Peace, justice and strong institutions (21%), SDG 14—Life below water (11%), SDG 2—Zero hunger (11%) and SDG 1—No poverty (11%). Source: own representation based on reports analysis.

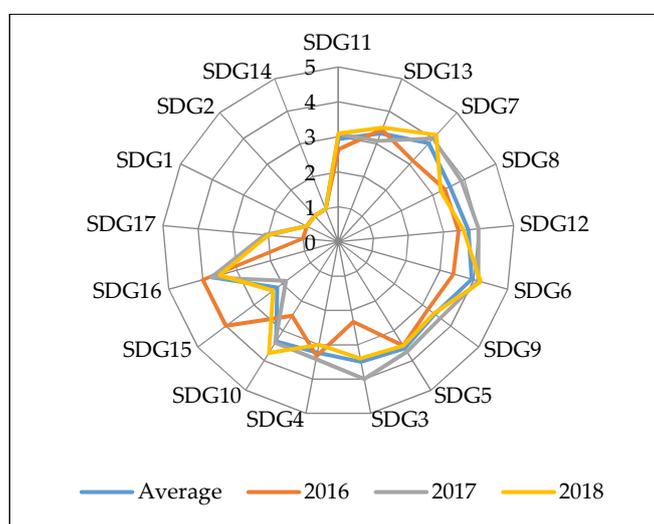
Instead, there are major quality differences in terms of reporting the goals relevant to real estate activities. The results show that the top goals are not necessarily the best reported. For example, SDG 6—Clean water and sanitation, ranked eighth in the ranking of priorities, registered the highest average quality score equal to 3.94 (Figure 5), which indicates the presence of the KPIs and the quantitative targets, which are correlated with the significance of the goal. The analysis shows that real estate entities are mainly concerned with streamlining the management of water consumption throughout the life cycle of buildings, monitoring the quantity and intensity of water in real time by user segments

and increasing the percentage of wastewater use. To this end, real estate companies set quantitative targets, such as the annual reduction of water consumption by 0.7%–3%/m<sup>2</sup> by 2030.

**Table 3.** Descriptive statistics on the quality of SDGs reporting.

SDGs	Observations	Mean	Standard Deviation	Min	Max
SDG 1	4	1.00	0.00	1.00	1.00
SDG 2	4	1.00	0.00	1.00	1.00
SDG 3	16	3.50	1.26	1.00	5.00
SDG 4	15	3.27	1.16	1.00	5.00
SDG 5	17	3.59	1.00	2.00	5.00
SDG 6	18	3.94	1.06	1.00	5.00
SDG 7	27	3.81	1.33	1.00	5.00
SDG 8	26	3.54	1.27	1.00	5.00
SDG 9	18	3.44	1.82	1.00	5.00
SDG 10	11	3.36	1.03	2.00	5.00
SDG 11	34	2.94	1.59	1.00	5.00
SDG 12	25	3.76	1.16	1.00	5.00
SDG 13	30	3.37	1.71	1.00	5.00
SDG 14	4	1.00	0.00	1.00	1.00
SDG 15	12	2.17	1.59	1.00	5.00
SDG 16	8	3.75	0.46	3.00	4.00
SDG 17	20	1.90	0.85	1.00	4.00
SDG 2016	12	2.73	1.34	1.00	4.29
SDG 2017	14	3.14	0.93	1.67	4.60
SDG 2018	11	3.08	0.81	1.67	4.67
Average Quality	37	2.99	1.03	1.00	4.67

Source: own representation based on reports analysis.



**Figure 5.** The quality of the SDG reporting. The average scores of each SDG, based on priority, are: SDG 11—Sustainable cities and communities (2.94), SDG 13—Climate action (3.37), SDG 7—Affordable and clean energy (3.81), SDG 8—Decent work and economic growth (3.54), SDG 12—Responsible consumption and production (3.76), SDG 17—Partnerships for the goals (1.90), SDG 9—Industry, innovation and infrastructure (3.44), SDG 6—Clean water and sanitation (3.94), SDG 5—Gender equality (3.59), SDG 3—Good health and well-being (3.50), SDG 4—Quality education (3.27), SDG 15—Life on land (2.17), SDG 10—Reduced inequalities (3.36), SDG 16—Peace, justice and strong institutions (3.75), SDG 14—Life below water (1.00), SDG 2—Zero hunger (1.00) and SDG 1—No poverty (1.00). Source: own representation based on reports analysis.

The following goals also have higher values than the average score related to the quality of the SDGs reporting: affordable and clean energy (SDG 7: 3.81), responsible consumption and production (SDG 12: 3.76), peace, justice and strong institutions (SDG 16: 3.75), gender equality (SDG 5: 3.59), decent work and economic growth (SDG 8: 3.54) and good health and well-being (SDG 3: 3.50). Most real estate entities correlate these goals deemed relevant with several KPIs and quantitative targets in order to dynamically compare the impact of their activity on the sustainable development.

In this respect, for SDG 7, the entities report the total energy consumption of the real estate portfolio, the amount of energy consumed by the heating and cooling systems, the energy intensity of the buildings and the share of the energy used from renewable sources (hydraulic energy, energy from biomass, solar energy, wind energy, geothermal energy). In order to increase the energy efficiency, the entities aim to supply their building portfolios with 100% renewable energy, by: installing solar panels, photovoltaic panels, wind turbines and geothermal energy-based systems, buying energy produced from emission-neutral fuels of carbon dioxide (CO<sub>2</sub>), providing customers with cogeneration units and green energy at affordable prices and introducing green clauses in space leasing contracts. The average rate of renewable energy produced or purchased by the analysed companies is 56%, and in some cases, it exceeds 98%. In addition, through the design, construction, renovation and management of high-energy performance real estate, entities contribute to achieving the EU objective of decarbonising buildings.

The information regarding the quantity of gas emissions generated by the buildings can be found in the sections dedicated to SDG 13, whose average quality score of 3.37 indicates the presence of quantitative KPIs and the lack of value-expressed targets. This situation reflects, in fact, the challenges of measuring the emissions from real estate constructions due to the lack of an internationally harmonised calculation and reporting methodology [61]. Hirsch et al. [61] show that 50% of the European investors, whose total real estate investments are worth EUR 260 billion, do not consider decarbonisation an important topic of discussion in the agenda of their boards, 18% do not evaluate the carbon emissions risks generated by their portfolios of real estate assets and 32% evaluate them only partially. Confirming their study, we found that most entities focus only on measuring CO<sub>2</sub> emissions from current activity, with 87% of the SRs reporting the value of direct (scope 1) and indirect gas consumption (scope 2). However, to achieve total decarbonisation, more advanced techniques for measuring the gas emissions generated by the entire life cycle of real estate properties are needed. For this purpose, the GHG Protocol standard introduced scope 3. Due to the lack of full control over the rented spaces, the real estate entities have difficulties in quantifying the indirect emissions (scope 3), which is why only 56% of the analysed reports provide information about them.

Real estate entities are quite concerned about their consumption and production models, correlating SDG 12 with specific indicators and targets to describe the extent to which they contribute to achieving this objective, as shown by the quality score equal to 3.76 out of 5. In 88% of the 25 SRs in which SDG 12 is prioritised, the entities refer to the sustainable management and efficient use of natural resources, declaring the source, quality and quantity of raw materials consumed. Most companies design production and consumption models that integrate the principles of the circular economy. Thus, in 64% of the SRs which underline the relevance of SDG 12, the entities report on waste management throughout the life cycle of buildings, proposing the reduction by 2–4 kg/m<sup>2</sup> of the built area construction waste and by 24–29 kg/m<sup>2</sup> of the built-up area of unsorted waste. Annually, businesses recycle on average 53% of the waste produced by property portfolios, but their goal is to achieve a recycling rate of 63%–80%. In order to inspire all stakeholders to contribute to the overall sustainability goals, in 48% of the SRs, the entities promote various practices to sensitise tenants and employees in reducing energy and water consumption and selecting waste, and to achieve long-term environment commitments with their suppliers regarding the integration of environmental and social criteria.

Social SDGs 3–5, 8 and 10 registered scores above average for reporting quality (3.27–3.59 out of 5), indicating that entities generally identify quantitative KPIs, and in some cases, set relevant value targets. These SDGs largely reflect the concerns of real estate entities for the health and well-being

of their employees, for ensuring equal opportunities, prospects for professional development and decent workplaces, equipped with modern technology to increase their productivity and creativity. They hardly reflect the effects of the activities performed on strengthening sustainable communities. In general, the entities descriptively correlate the activity carried out with its social impact, mentioning the role of the constructions, according to the criteria of demand, in the development of the community. In 56% of the analysed SRs, the entities report, as part of SDG 8, the direct, indirect and induced economic impact on the local communities, through the created jobs, the taxes paid and the value contribution to the formation of the GDP.

In order to improve the quality of life through the created supply of living and working spaces, real estate entities contribute to the construction of sustainable cities and communities, which is why for 87% of the SRs, SDG 11 is the priority goal. However, the average level of the quality score of the reported information for this goal is 2.94, below the mean value of the SDG reporting quality. Most entities set their targets qualitatively, and sometimes, in order to highlight the progress of their initiative in sustainable development, they refer to relevant quantitative indicators (for example: area of renovated buildings, value of investments, number and area of certified buildings, number of parking places for bicycles, etc.). Following the upward trend of the urban population, 88% of the SRs set SDG 11 as a priority, which means that real estate companies describe their intentions and the actions initiated to consolidate the inclusive and sustainable urbanisation. Creating smart cities, working spaces and homes, ensuring urban balance and rebuilding cities are the most common ambitions of the real estate entities. Actions initiated in this regard include: the design and development of multifunctional urban neighbourhoods and dynamic hybrid cities, capitalisation of urban free land according to the best use, restoration of existing buildings, promotion of the use of alternative means of transport, etc. In addition to these measures, real estate entities invest in: housing located in the proximity of urban centres, which is affordable to the population with low and medium incomes, common workspaces with flexible rental terms, digital technologies and building certification.

Even though the third-party certification of buildings, mostly environmental, is a clear proof of how the performance of a building ensures the sustainable development of the communities and thus contributes to the achievement of the SDGs 3, 7–9, 11–13, 15 and 17 [62], the analysed SRs analysed show a lack of synergy between the purpose of certifying the buildings and the prioritised sustainable goals. In only 15% of reports, the real estate companies present their efficient buildings certification as a measure of contributing to the clean energy (SDG 7), sustainable cities and communities (SDG 11), responsible consumption and production (SDG 12) and climate action (SDG 13). This fact can be the consequence of a lack of a current sustainable building assessment tool for describing the relationship between its benchmark criteria for sustainable buildings and the SDGs [63]. In addition, there are multiple green building rating and certification systems that make the data incomparable between markets [64]. However, in over 50% of the analysed reports, the entities certify their buildings in each life-cycle phase according to the Building Research Establishment Environmental Assessment Methodology (BREEAM), which is the prevailing assessment method in Europe [65]. Nevertheless, as the labelling tools of buildings include mostly environmental criteria, the economic, institutional and social features of buildings are rarely considered in these methods, which distorts the definition of sustainable development clearly reflected through the 17 SDGs [65].

Also, several companies (35% of the SRs in which SDG 11 is prioritised) take measures to protect the natural and cultural heritage, so as to ensure the access of all to the green and safe public spaces, such as: designing new buildings respecting the architectural style of old buildings, avoiding the use of agricultural land for new constructions, creating green terraces in the urban environment, paying compensatory taxes for the creation of green spaces in alternative areas, etc.

The institutional dimension of sustainability expressed by SDGs 16 and 17 is relatively visible in the SRs of real estate entities. Of the two, the institution goal (SDG 16) is the best represented in terms of reporting, with an average quality score of 3.75. Given the high sensitivity of the real estate sector to corruption and bribery [8], in 88% of the SRs in which SDG 16 is relevant, anti-corruption actions

are promoted through corporate governance actions, such as: clear delimitation of tasks, consultation of an adequate number of suppliers, internal and external audit, systematic control of workers and construction works, application of activity guides, real estate agents remuneration, implementation of internal systems for reporting irregularities, etc. The medium score for SDG 17 of 1.90 indicates the predominantly qualitative approach in presenting the partnerships concluded with the aim of completing the efforts for sustainable development.

The first two goals of sustainability are the least prioritised and disclosed, with the quality score of 1 indicating the lack of concrete actions to achieve these SDGs. This situation may be a consequence of the fact that the management of many entities considers SDGs 1 and 2 to be the priorities of the public institutions rather than of the business environment [6].

The exploration of the SRs published by the real estate entities in the EU highlights the following: the correspondence of the SDGs with the core operations, the different approach in reporting the priority objectives, the poor quality of the reporting, the lack of links between the KPIs assigned to the priority SDGs and the impact on the community.

## 5. Summary and Concluding Discussion

Starting from the 17 SDGs through which the UN draws attention to the most urgent global issues of sustainability and the need for cohesion of everyone's efforts to solve them, we set out to study how the real estate entities in the EU align with these objectives. The fact that sustainability in the real estate sector revolves in a vicious circle was an additional motivation for this research. Following an interpretative–inductive approach, the study qualitatively explored 39 sustainability reports published by real estate entities to evaluate sustainability commitments. The SRs are the main sources of documentation for stakeholders about the role of entities in society. In addition, to assess the depth with which entities report their sustainability commitments, we used a reporting quality score, based on a set of indicators correlated with sustainability goals.

Studying the GRI database, the source of the analysed SRs, we noticed the weak participation of the real estate entities in reporting on the corporate responsibility in comparison with other economic sectors. Companies from the Western EU countries are the most active in the non-financial reporting, most of them in Sweden. CEE countries are the least represented in the GRI database, which highlights a low level of transparency of corporate sustainability. However, this situation may be the consequence of the predominant organisation of real estate activities in the form of SMEs which, according to the Directive 2014/95/EU, are not forced to present non-financial information. Nevertheless, the interest of entities in disclosing their non-financial performance through SRs is increasing, especially in the SMEs. In addition, in order to legitimise the activity carried out and to assure stakeholders of the credibility of the reported information, the real estate entities pay special attention to the preparation of the SRs by aligning them with the GRI standards, known for their wide use, and by externally assuring the non-financial reporting.

The results of the study showed that although more and more real estate entities are expressing their interest in sustainable development, there is still a large gap between the intentions assumed and the real actions undertaken by these companies. Most of them do not have the strategy, culture and tools needed to turn sustainability commitments into concrete actions. According to the average quality score (2.99 out of 5), entities use the qualitative approach more when presenting their sustainability aspirations and report fewer quantitative KPIs to measure the degree of achievement of the priority SDGs. These results match the findings reported by PwC [6,53] for most of the economic activities. The companies correlate the actions performed, on average, with 8 of the 17 SDGs. These are rather associated with the specificity of real estate activity than with the results of an analysis regarding the actual contribution of the entity to the achievement of each objective. SDG 11, SDG 13, SDG 7, SDG 8 and SDG 12 are the targets most frequently reported by real estate entities, and SDG 1, SDG 2 and SDG 4 are the least commonly encountered in SRs.

In other words, the ranking of the prioritised SDGs shows, on one hand, the private topics specific to real estate field and, on the other hand, the topics for which the public institutions have a greater responsibility as the goals associated with them are less disclosed in the reports of the entities. Among the private topics of sustainability, we observe the concern of real estate entities about the environmental issues, especially climate change, carbon emissions and energy consumption, which are actually the issues that most concern the academic, political and professional representatives [60,66]. Even though the literature “makes reference to the holistic nature of the sustainability concept” ([60], (p. 746)), there is “a market tendency to consider buildings with high ratings for environmental performance as sustainable” ([67], (p. 6)). Because the market recognises sustainability as a competitive factor that adds value to a property, real estate companies create new strategies and investment fields based on sustainable principles in order to ensure positive financial outcomes (lower operating costs, higher lease rates, higher occupancy rates and lower tenant fluctuation). In a broader sense, sustainable real estate improves the business position and competitiveness of companies, but by disclosing supplementary key data about business strategy, value chain, risk management, corporate governance, employees, dialogue with stakeholders, contribution to communities, etc., the entities also diminish the uncertainty about their future cash flow distribution [68]. In this context, the sustainability reporting is a way to meet the dynamic demands of the real estate markets.

Among the public issues, to which the real estate entities pay less attention, we mentioned social issues like poverty, hunger, income inequality, education, health, well-being and gender equality, and institutional issues, such as peace, justice and strong institutions. Protection of ecosystems, marine and terrestrial biodiversity are also considered public topics. However, through an in-depth analysis of all the positive and negative correlations between each SDG and the activity carried out, the entities can find solutions to reach all the sustainability goals because the 17 SDGs of the 2030 Agenda are interlinked. Urbanisation (SDG 11) is not the only one to have the impact on resource and material consumption (SDGs 7, 12) as well as on climate (SDG 13), there are also essential inter-linkages to ecosystems and biodiversity (SDGs 14, 15) [69]. For example, land-take settlement for the expansion of residential areas and construction sites across Europe comes at the expense of agricultural zones (77.8%), forests (14.4%) and semi-natural and natural areas (6.3%), which affects the biodiversity and ecosystems [69]. To face these environmental challenges, the EU should increase the land use efficiency.

The global focus of the 2030 Agenda makes its implementation complex, requiring innovative and close collaboration between the public and the private sectors, civil society and other parties. This cooperation should be based on the local needs for a greater efficiency in achieving the SDGs, taking into account the local nature of the real estate. For example, the urban population growth, the limited land supply and the higher appreciation of housing prices than incomes have generated a large-scale housing shortage in several EU cities, such as London, Paris, Stockholm, Helsinki, etc. [70]. In order to create an adequate supply of social and affordable housing, local authorities and the private sector need to work together. The major roles of local authorities are to elaborate sustainable policies, assuring an efficient urban planning system that aligns with the principles of good density and at the same time, with the Directive regarding the energy performance of buildings, and to increase the investment in the residential sector. The participation of the real estate companies in the development of housing affordability consists of the use of modern methods to speed up the construction, of sustainable materials and qualified human resources.

The SDGs capture in a detailed and realistic way the broad and complex challenges that the world faces, which is why the goals need more attention and more resources. Given the major role of the real estate sector in consolidating sustainable communities, the real estate entities cannot remain indifferent to these challenges. The SDGs must be used in a holistic way as a reference point for real estate business strategies. The construction and real estate sectors should fully integrate all SDGs in their business model for a complete transfer from “green buildings” to “sustainable buildings”, thus incorporating all dimensions of the “quadruple bottom line approach” (environmental, social, economic and institutional factors). This transformation should begin in the early design phase of the

construction projects and continue along the whole building life cycle, while fostering constructive collaboration between the different stakeholders of building projects.

In order to achieve long-term positive results following the integration of the SDGs, the communication between stakeholders involved in different phases of the life cycle of the building must be transparent. The opacity, the opposite of transparency, is the consequence of the information asymmetry that generates higher transaction costs, and the public institutions have the legal levers to manage the information problem, such as: respect for property rights, anti-corruption policies/practices, robust regulations, efficient land administration system, safety mechanisms in the construction permitting system, etc.

The results of our study should be treated with care due to the limitations. The subjective selection criteria of the entities registered in the GRI database generated a rather small sample that does not allow the results to be extrapolated to the whole real estate sector. In addition, all the entities analysed are from EU Western countries, as we did not find any real estate entity from the Eastern EU in the GRI database. This fact indicates the poor representation of the SDGs in the business models of the real estate sector from Eastern countries. Many authors highlight that, in general, corporate sustainability is a relatively new concept for these countries [71], which explains why the level of reporting of non-financial information in Eastern countries is so low [71]. From the methodological perspective, the limitation is related to the subjective nature of the content analysis [52], which intervenes in the creation of the coding system and the evaluation of the reporting quality.

Despite these limitations, we consider that our findings offer useful insights about the ways the SDGs are implemented and perceived by the EU real estate entities, taking into account that to our knowledge, this is the first paper that analyses the SDG priorities of the EU real estate entities and appreciates the quality of their SDG reporting. This knowledge allows for a better understanding of the challenges and opportunities in integrating and implementing the SDGs' targets in the real estate sector. Also, the study is useful for the management boards of the companies, offering a mirror in which their approaches to sustainability reporting and SDG priorities are reflected. This research should be a signal both for the CEOs who need to lead the engagement on sustainability goals in their companies and for the policy makers who must create sustainable policies. Moreover, the property companies should view the SDGs as new opportunities to create value in the long-term, both for their organisation and for the global community. But for these opportunities to materialise, the entities must consider the necessary resources for investment in sustainability and the appropriate indicators to measure the benefits of embedding sustainability within their business models.

Looking to the future, new frameworks for assessing the relationship between the real estate field and the SDGs are still required. Creating and using more quantitative indicators to monitor the progress of each goal in the real estate field is also required to inform policy makers and ensure accountability by all stakeholders. In addition, the proposed framework, together with the indicators, has to be empirically tested and validated at the company level and after that, at the country and region level. Also, this study can be extended to more entities from different countries and regions for a comparative analysis of the SDGs reporting mode. However, further research is needed in all areas to highlight the synergic opportunities for the implementation of the SDGs.

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## Appendix A

Table A1. Statement of the entities studied at the end of the financial year 2018.

Name	Country	Organization Type	Listed/ Non-Listed	Sector	Size	Number of Employees	Real Estate Investments (EUR mil.)	Total Revenues (EUR mil.)	Total Fixed Assets (EUR mil.)	Reporting Years
Arcadis	The Netherlands	Private	Listed	Real estate owners and developers	MNE	27,354	-	3255.57	1232.70	2017, 2018
Bonava	Sweden	Private	Listed	Real estate owners and developers	Large	2075	-	1366.06	70.21	2016, 2017, 2018
Castellum	Sweden	Private	Listed	Real estate owners and developers	Large	381	8695.66	543.87	8871.69	2016, 2017, 2018
Conwert Immobilien Invest 1	Austria	Subsidiary	Listed	Real estate owners' and developers' spaces	MNE	n/a	n/a	n/a	n/a	2016
JM AB	Sweden	Private	Listed	Real estate owners and developers	Large	2562	-	1576.02	20.87	2016, 2017, 2018
Kungsleden	Sweden	Private	Listed	Real estate owners and developers	Large	109	3383.65	232.59	3385.70	2016, 2017, 2018
Sato Oyj	Finland	Private	Unlisted	Real estate owners and developers	SME	218	3875.10	290.40	3903.40	2016, 2017, 2018
Sonae Sierra	Portugal	Private	Listed	Real estate owners and developers	Large	1057	2097.00	144.30	2097.00	2017, 2018
Specialfastigheter Sverige	Sweden	State owned	Unlisted	Real estate owners and developers	SME	144	2661.13	208.50	2761.96	2016, 2017, 2018
Wallenstam	Sweden	Private	Listed	Real estate owners and developers	MNE	251	4467.49	186.26	4639.42	2017, 2018
Alstria Office	Germany	Private	Listed	REITs	Large	149	3938.86	193.00	4003.51	2016, 2017
Befimmo	Belgium	Private	Listed	REITs	Large	86	1447.24	144.07	2458.21	2017, 2018
Cofinimmo	Belgium	Private	Listed	REITs	Large	134	3694.20	212.17	3881.02	2016, 2017, 2018
Covivio	France	Private	Listed	REITs	Large	922	20,139.34	955.89	22,052.53	2016, 2017, 2018
Grivalia	Greece	Subsidiary	Listed	REITs	SME	28	1008.23	72.54	1083.07	2017
IntuProperties	Great Britain	Private	Listed	REITs	Large	2654	7175.78	584.13	8093.21	2016, 2017, 2018

a Organisations are classified based on the EU definitions of size. 1 The Conwert Group was absorbed in 2017 by Vonovia, and data on the financial status of the sub-group at the end of the financial year 2018 were not found. Source: own representation based on data collected from reports.

## Appendix B

Table A2. Description of categories and related codes.

The Categories Represented by the SDGs		Description of Codes	
1.	No poverty: end of poverty in all its forms	1.	Projects to support poor communities.
2.	Zero hunger: end hunger, achieve food security and improved nutrition and promote sustainable agriculture	1.	The efforts made for the efficient planning of land use according to the needs of the community and the diversification of the supply chain.
3.	Good health and well-being: ensure healthy lives and promote well-being for all at all ages	1.	Policies to promote the health and well-being of employees at all levels of the value chain.
		2.	Measures to promote the health and well-being of local communities.
4.	Quality education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	1.	Lifelong learning opportunities at all levels of the value chain.
		2.	Skills to support the future needs of the business.
5.	Gender equality: achieve gender equality and empower all women and girls	1.	Equal pay for women and men for the same work.
		2.	Representation of women in leadership positions.
6.	Clean water and sanitation: ensure access to water and sanitation for all	1.	Water use efficiency.
		2.	Proportion of wastewater treatment.
7.	Affordable and clean energy: ensure access to affordable, reliable, sustainable and modern energy	1.	Improving energy efficiency.
		2.	Share of the renewable source energy usage.
8.	Decent work and economic growth: promote inclusive and sustainable economic growth, employment and decent work for all	1.	Economic impact on the community.
		2.	Increasing labour productivity by creating decent and modern workspaces.
9.	Industry, innovation and infrastructure: Build resilient infrastructure, promote sustainable industrialisation and foster innovation	1.	Development of qualitative, reliable, sustainable and powerful infrastructure.
		2.	Supporting small industrial enterprises.
		3.	Green industrial technologies and processes.
		4.	Investments in research and development.
10.	Reduced inequalities: reduce inequality within and among countries	1.	Equal opportunities for employees, including those with disabilities or from disadvantaged backgrounds.
		2.	Remuneration of employees in relation to the maximum value of the income registered in the entity.
11.	Sustainable cities and communities: make cities inclusive, safe, resilient and sustainable	1.	Construction of safe, accessible and decent housing and workspaces.
		2.	Projects for inclusive and sustainable urbanization.
		3.	Efforts to protect the cultural and natural heritage.
		4.	Ensuring access to inclusive and sustainable public green spaces.

Table A2. Cont.

The Categories Represented by the SDGs	Description of Codes
12. Responsible consumption and production: ensure sustainable consumption and production patterns	<ol style="list-style-type: none"> <li>1. Management of the efficient use of natural resources (source, quality and consumption of raw materials).</li> <li>2. Waste management (prevention, reduction, recycling and reuse).</li> <li>3. The share of recycled waste.</li> <li>4. Promoting sustainable practices throughout the life cycle of the building.</li> </ol>
13. Climate action: take urgent action to combat climate change and its impacts	<ol style="list-style-type: none"> <li>1. Resilience and ability to adapt to natural disasters.</li> <li>2. Integration of climate change measures into the business strategy.</li> <li>3. Measures to reduce greenhouse gas emissions.</li> </ol>
14. Life below waters: conserve and sustainably use the oceans, seas and marine resources	<ol style="list-style-type: none"> <li>1. Impact of activity on aquatic ecosystems.</li> <li>2. Measures to address future risks caused by depletion of aquatic ecosystem resources.</li> </ol>
15. Life on land: sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss	<ol style="list-style-type: none"> <li>1. Measures to reduce the degradation of natural habitats.</li> <li>2. Measures to address future risks caused by depletion of terrestrial ecosystem resources.</li> <li>3. Managing the impact of economic activities on terrestrial ecosystems.</li> </ol>
16. Peace, justice and strong institutions: promote just, peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	<ol style="list-style-type: none"> <li>1. Anti-corruption practices.</li> <li>2. Contribution to the efficient and transparent development of institutions.</li> <li>3. Measures to promote responsible, inclusive, participatory and representative decisions at all levels.</li> </ol>
17. Partnership for the goals: revitalise the global partnership for sustainable development	<ol style="list-style-type: none"> <li>1. The value of investments in partnerships made up of several stakeholders.</li> <li>2. The value of the contribution to the state budgets.</li> </ol>

Source: own representation based on UN targets, GRI and RICS recommendation.

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