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Review

Corporate Social Responsibility and Renewable Energy Development for the Green Brand within SDGs: A Meta-Analytic Review

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Abstract: This study aimed to systemize global scholarly publications on corporate social responsibility and renewable energy to detect their influence on green brand development within the SDGs. The initial data are retrieved from the Scopus database. To operate with the most relevant publications, several limitations were applied. The research sample consists of the 2000 most cited articles in the subject areas of (1) Social Sciences, (2) Business, Management, and Accounting, and (3) Economics, Econometrics, and Finance. This study is carried out in the following logical sequence. The first stage involves searching, collecting, and preprocessing articles representing the investigated topic. Then, several bibliometric techniques were employed to analyze and map the findings. The third stage integrated the obtained results and discussed future research directions. This paper offers some theoretical implications by analyzing and visualizing the investigated scientific output, particularly publication dynamics, the main trends in the investigated research field, the most productive scholars and their collaborations, and the contributions of the journals, affiliations, and countries analyzed. In addition, this study makes some practical contributions and could be used by scholars as detailed instructions for conducting bibliometric analyses in different contexts. Furthermore, researchers could exploit and expand their current study directions using the findings of this paper. However, the findings of this study are limited since they consider only articles from the Scopus database. Therefore, it is appropriate that further studies involve a broader data range.

Keywords: bibliometrics; corporate social responsibility; green brand; knowledge mapping; renewable energy; scientific output; sustainable development

Citation: Us, Y.; Pimonenko, T.; Lyulyov, O. Corporate Social Responsibility and Renewable Energy Development for the Green Brand within SDGs: A Meta-Analytic Review. *Energies* **2023**, *16*, 2335. https://doi.org/10.3390/en16052335

Academic Editor: Bert Scholtens

Received: 1 February 2023
Revised: 25 February 2023
Accepted: 25 February 2023
Published: 28 February 2023

1. Introduction

The intense economic growth toward hi-tech development depletes natural resources and involves large-scale territories while increasing the environmental burden. The exhaustive effect of economic development is considered irrational and contravenes long-term social prosperity [1–4]. Given the above, in 1992, more than 178 countries adopted Agenda 21, which is a comprehensive plan of action aimed at building a global partnership for sustainable development harmonizing economic, environmental, and social spheres [1,5,6]. Later, the 2030 Agenda for Sustainable Development adopted at the UN Sustainable Development Summit in 2015 called all countries for urgent action to spur economic growth, reduce inequality, improve health [7] and education [8–10], and mitigate climate change worldwide [11]. Global climate change, green consumer concerns, and government pressure lead businesses to turn green [12–15]. Companies are becoming more interested in corporate social responsibility and implementing renewable energy technologies to build reliable green brands [16–23]. In this line, Reyes-Mercado and Rajagopal [24] indicated that the national policy and corporate strategy should cover the issues of renewable energy since it allows the achievement of the environmental, social, and economic benefits that are the main pillars of sustainable development. Prior studies [25–29] concluded that

renewable energy consumption positively impacts green economic growth despite the high initial cost of establishing renewable energy facilities. Popa et al. [30] emphasized that green investing in green energy projects is essential for the green economy and sustainable development of society. Corresponding to the principles of sustainable development and initiating environmental conservation is considered to be a trigger for long-term economic growth [31–33]. It is worth noting that in 2019, the European Commission presented the European Green Deal (EGD), which is a road map of green transformations to make the EU economy sustainable and climate-neutrality until 2050 [33]. The EGD considers clean energy, sustainable industry, building and renovation, the 'from farm to fork' strategy, eliminating pollution, sustainable mobility, biodiversity, and sustainable finance as the main directions of green transformations. To be attractive in national and particularly international markets and correspond to customers' interests, companies are interested in green transformations and developing their green brands [34]. The results of the web search analysis using the Google Trends tool showed the growing interest of netizens in green brands. Thus, compared to 2015, the web searches on 'green brand' increased by 2.2 times in 2022 (Figure 1).

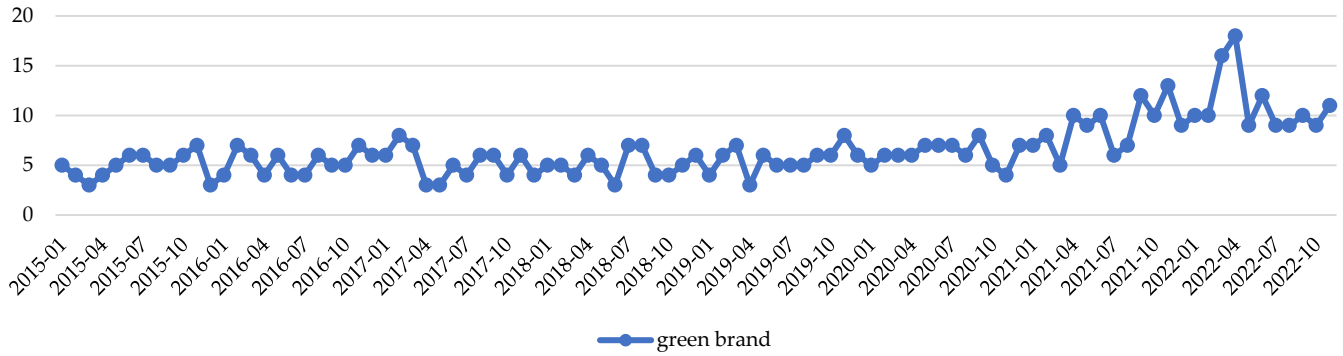

Figure 1. Web search dynamics, 2015–2022.

The growth of Web search dynamics (Figure 1) could be explained by the revision of the SDGs by the scientific community in 2015. Thus, United Nations Member States accepted "The 2030 Agenda for Sustainable Development", which involves 17 goals and 169 targets for attaining by 2030 [34,35].

In addition, this study applied sentiment analysis to analyze netizens' emotions toward green brands. The tweet text analysis showed that most tweets on green brands belong to the right-bottom quadrant. Thus, the findings show that green brands evoke pleasantly subdued and calm emotions in Twitter users (Figure 2).

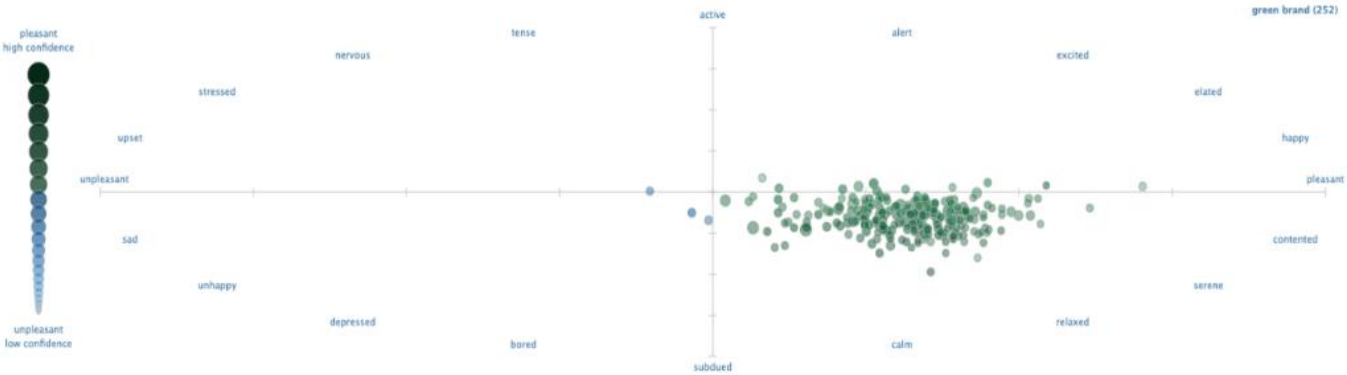

Figure 2. The findings of sentiment analysis.

CSR is a significant contributor to the development of green brands [35,36]. Nguyen et al. [37] noted that promoting positive social responsibility allows companies to increase clients'

green brand trust, interaction, and satisfaction [38,39]. Thus, green satisfaction triggers green customer loyalty [40]. On the other hand, Zhang et al. [41] indicated that the environmentally irresponsible behavior of employees has an adverse impact on the brand. The customers consider the company's behavior to be hypocritical. Therefore, there is a decrease in the green brand evaluation and customer engagement. In this view, companies try to behave as responsible actors to improve the green perceived image, green reputation, green value, and green admiration of their brand [42]. To be socially responsible, the companies aimed to decrease the adverse environmental impact, rationally use natural resources, strengthen industrial security and occupational health, ensure ethical business practices and transparency in communication with customers and employees, avoid corruption, etc.

CSR plays a significant role in a company's relationship with stakeholders [43,44]. Although sustainable development provides new opportunities for green transformations, it could provoke several risks for companies on the global stage. Therefore, companies must reconsider existing business strategies and models while implementing CSR under the SDGs [45,46]. A number of studies investigate the linkage between CSR and green brands under green marketing [47]. Lymperopoulos et al. [48] highlighted that CSR has a critical role in green bank marketing, allowing it to increase customer trust. In the example of Vietnam commercial banks, Nguyen and Nguyen [49] showed that green bank image benefits from green product development, green corporate social responsibility, and green internal processes, which are the main composite elements of the green marketing scale. Lee et al. [50] confirm the mediating role of CSR and green brad in consumers' attitudes and the company's transparency. Lin et al. [51] underline the crucial role of CRS in providing a green brand to companies and promoting green brand communications with customers. Similar conclusions are obtained from past studies [52–54].

The above analysis of scientific literature shows that the issues of green branding are of academic, policy, and business importance. However, there is still a gap in investigating the influence of corporate social responsibility and renewable energy on green brand development within the SDGs. Thus, the paper aims to answer the research questions: what the main research directions in the investigation of corporate social responsibility, renewable energy, and green brand within the SDGs are? The abovementioned makes it appropriate to systemize the academic background on corporate social responsibility and renewable energy to detect their influence on green brand development within the SDGs. In turn, it is appropriate to visualize the main research directions, detect the collaborations between scholars and estimate their contributions, figure out the most prestigious scientific journals, etc.

The structure of the remainder of this paper is as follows: Section 1 demonstrates the preliminary findings of the literature analysis about the investigated topic; Section 2 provides the material and methods used in this research; Section 3 refers to the results of bibliometric analysis; and Section 4 discusses the related conclusions and provides suggestions for further study.

2. Materials and Methods

This part of the paper is based on the PRISMA technique and provides a methodology of meta-analytic review combined with a bibliometric analysis to detect the existing relationship between the fields of research on corporate social responsibility and renewable energy development for the green brand within SDGs. This study invoked the Scopus scientific research engine to identify the investigated topic publications. It is noteworthy that Scopus is the largest abstract and citation database of peer-reviewed scientific literature sources. This database comprises more than 84 million interdisciplinary scientific studies, while the number of involved scholars exceeds 18 million by approximately 95 thousand affiliations. Therefore, Scopus data allow for covering the global research output to deliver a comprehensive critical overview of the analyzed topic. Bibliometrics and knowledge visualization methods were applied to analyze the interplay among articles and keywords and draw a comprehensive picture of growing trends and potential research opportu-

nities in the investigated research field [55]. The publication dynamic, the main trends in the investigated research field, the most productive scholars and their collaboration, and the contributions of journals, affiliations, and countries were analyzed. Notably, the main advantage of bibliometric analysis is ensuring that the quantitative rigor literature review avoids the authors' subjective bias [56]. The bibliometric analysis was performed through the bibliometric R package and VOSviewer 1.6.16 software toolkit. The first review stage concerns searching, collecting, and preprocessing articles representing the investigated topic. Then, several bibliometric techniques were employed to analyze and map the findings. The third stage integrated the obtained results and discussed future research directions (Figure 3).

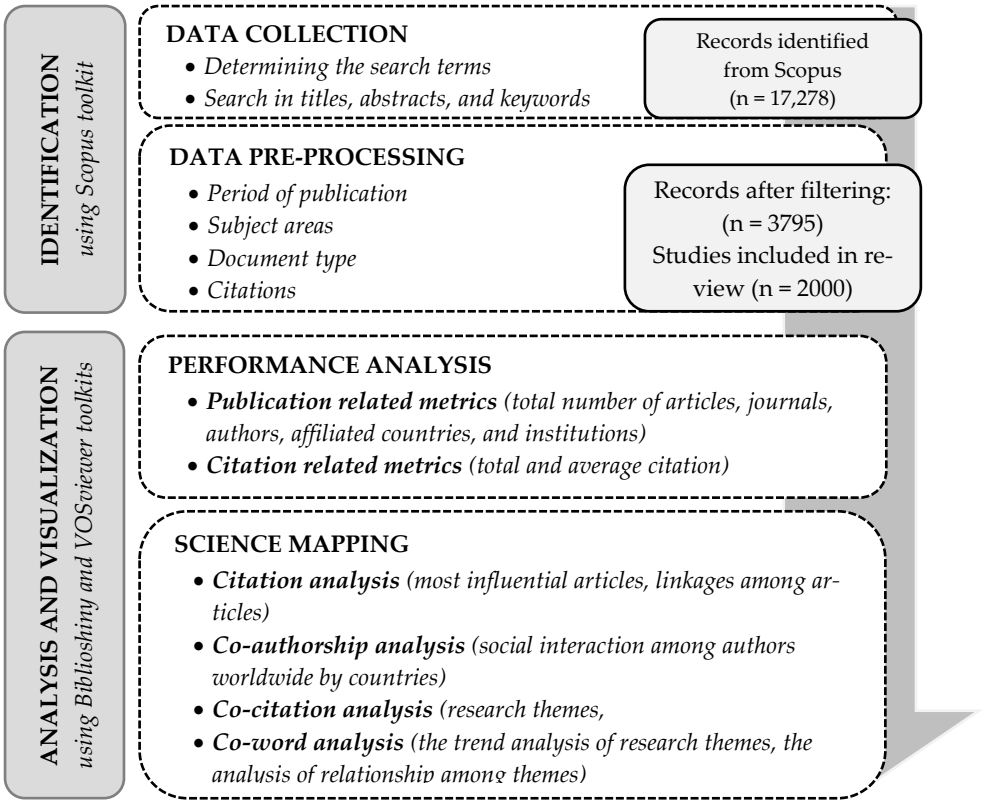

Figure 3. Research design considering the PRISMA technique.

2.1. Data Source and Search Strategy

This study engaged global scholarly publications devoted to analyzing the interplay between corporate social responsibility and renewable energy development regarding green brand development within the SDGs. The initial data are retrieved from the Scopus interdisciplinary database, with the last access on 1 January 2023. According to Falagas et al. [57], the Scopus database is considered to be more relevant for bibliometric analysis because it involves a more comprehensive scientific journal range. The search was conducted in several steps (Table 1).

The search query involved the Boolean operator 'AND' to cover all keywords and their combinations and 'OR'—at least one. To operate with the most relative publications, the subject areas were limited to the following subject fields: (1) Business, Management, and Accounting, (2) Social Sciences, and (3) Economics, Econometrics, and Finance. The research covers documents published from 2000 to 2022. Therefore, the initial data sample consisted of 3888 publications (Table 2). However, since Scopus limits the number of documents that could be exported, 2000 of the most cited papers were selected.

Table 1. Data collection steps on Scopus.

№	Query on Scopus	Description	No. of Documents
1	TITLE-ABS-KEY	(“corporate social responsibility” AND “renewable energy”) OR (“green brand” OR “sustainable brand” OR “green image” AND “renewable energy”) OR (“sustainable development” AND “renewable energy”) OR (“corporate social responsibility” AND “green brand” OR “sustainable brand” OR “green image”) OR (“corporate social responsibility” AND “sustainable development”)	17,740
2	AND PUBYEAR	1999 > PUBYEAR < 2023	17,584
3	AND LIMIT-TO SUBJAREA	(1) Social Sciences; (2) Business, Management, and Accounting; (3) Economics, Econometrics, and Finance.	5321
4	LIMIT-TO DOCTYPE	Article	3888

Table 2. The main information on the filtered dataset.

Description	Results
Documents (articles)	2000
Single-authored documents	316
Average citation per document	41.83
Sources (Journals, Books, etc.)	417
Authors’ keywords	5180
Authors	5211
Authors of single-authored documents	300
Authors of multiauthored documents	4911
Documents per author	0.384
Authors per document	2.61
Coauthors per document	3.13
Collaboration index	2.92
Period	2000–2022

This study operates only with scientific articles. After filtering, the total sample of documents for analysis is the 2000 most cited articles (316 single-authored articles and 1684 coauthored articles) dispersed in 417 sources. The number of authors is 5211 (300 authors of single-authored articles and 4911 authors of multiauthored articles). The average number of coauthors per article is approximately 3.

2.2. Data Analysis and Visualization

2.2.1. Performance Analysis

To evaluate the main research trends in the investigated field, this study applied productive (annual growth rate of involved articles) and impact metrics (e.g., the contributions of scholars, journals, authors, affiliated countries, institutions, and citation activity). The formula for calculating the annual growth rate of publication activity was retrieved from the study by Shi et al. [58]:

$$AGR_{ij} = \frac{N_i - N_j}{N_j} \times 100\% \quad (1)$$

where AGR_{ij} is the annual growth rate, N_i is the number of documents in the current year, and N_j is the number of documents in year *i-1*.

2.2.2. Intellectual Structure

The intellectual structure of the analyzed scope of literature was built under the distance-based approach of cocitation analyses. This resulted in the visualization of the collaboration world map among scholars worldwide.

2.2.3. Research Trends

This study applied co-word network analysis and clustering to define the typologies of themes of the examined keywords. The four quadrants of the two-dimensional diagram (centrality and density) were built [56]:

(1) The upper-right quadrant with the high centrality and density keywords. This quadrant visualizes the motor themes, which are well-developed, significant, and influential in the subject area under investigation.
(2) The upper-left quadrant with the high density and low centrality keywords. They identify the niche themes of limited importance.
(3) The lower-left quadrant with low centrality and density keywords. This quadrant reveals emerging or disappearing research-related themes.
(4) The lower-right quadrant has high centrality and low-density keywords. It unveils the primary themes. These themes could be regarded as fundamental in the studied scientific field.

The following criteria were used to construct the thematic map: the field of analysis—keyword plus; the number of involved words—500; the minimal cluster frequency—10 words; the number of labels for each cluster—3 labels; label size—0.2.

3. Results

Figure 4 shows the progression of articles available in Scopus data on the linkage between corporate social responsibility and renewable energy development for the green brand within SDGs. The initial statistics show the annual growth of publications from 2000 to 2022. Only one slight reduction in publications occurred in 2004. The first significant splash of publication was in 2005, which could result from the Kyoto Protocol enters into force. It sparked scholars' interest in exploring the possibilities of greenhouse gas emission reduction. Then, after the UN Conference on Sustainable Development (Rio+20), held in Rio de Janeiro, the number of publications increased by 42.9%. In 2021, the number of publications was 564; in 2022, it increased by 7.4% (606 articles).

Table 3 presents the top 10 most cited and representative articles on the investigated topic in the Scopus database from 2000 to 2022. These articles could be considered to be the most influential in developing research on the interplay between corporate social responsibility and renewable energy development regarding green brand development within the SDGs. Thus, the most cited article is 'Corporate social responsibility and access to finance' by Cheng Beitinga, Ioannou Ioannis, and Serafeim George, published in 2014. This article was cited 1221 times. The average citation per year is above 135 times. Field-weighted citation impact shows that factual citations exceed the expected citations by 30 times. The categories, Captures (Export-Saves) and Readers of PlumX metrics, were considered to explore how people interact with these articles. Thus, the most cited article's citation had been exported or saved 6612 times, while 1195 people added it to their library/briefcase.

Based on the filtered dataset, 5211 scholars across 1127 countries studied the linkages between corporate social responsibility and renewable energy development for the green brand within SDGs. Three hundred scholars are the authors of single-authored documents. Table 4 lists the top 10 authors who most contributed to the development of the analyzed topic.

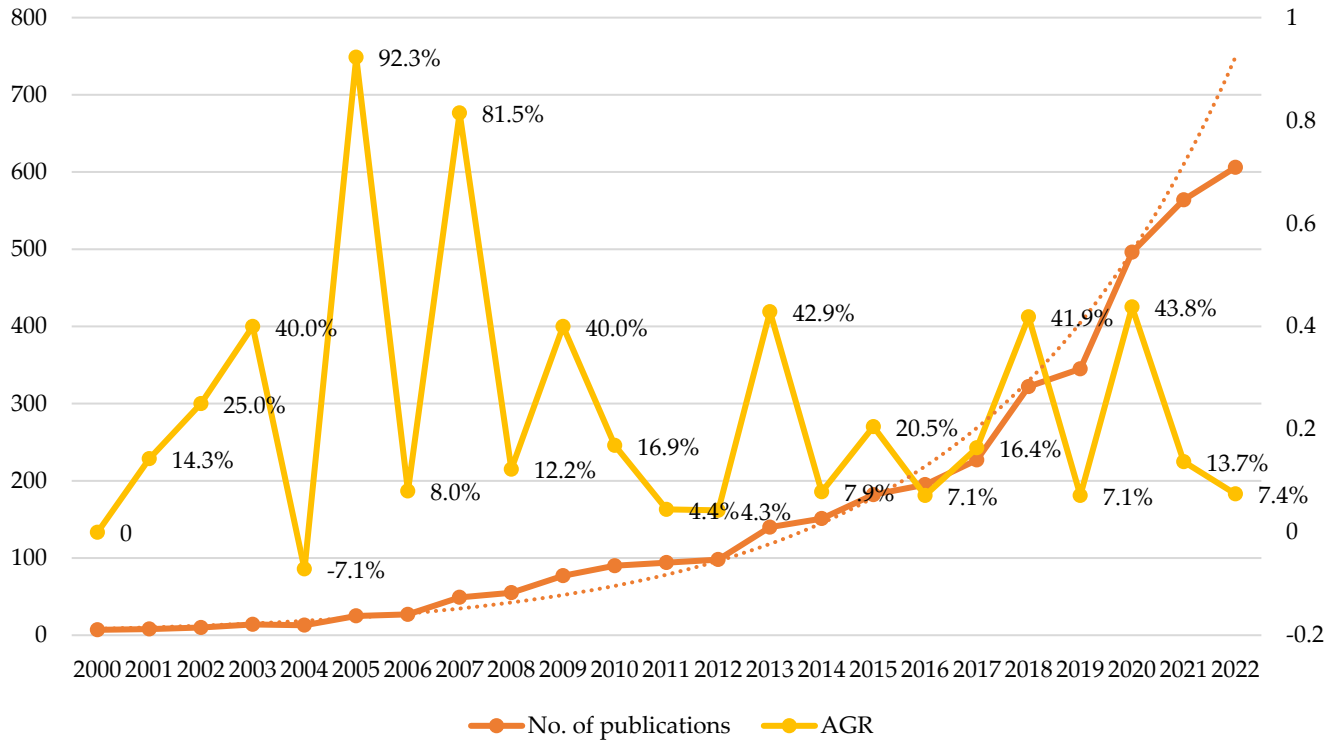

Figure 4. Annual scientific production according to Scopus, 2000–2022.

Table 3. Top 10 most cited articles according to the filtered Scopus dataset, 2000 to 2022.

№	Authors/Year	Title	Source	TC	TC Per Year	FWCI	PlumX Metrics	
							Captures (Export-Saves)	Readers
1	Cheng et al., 2014 [59]	Corporate social responsibility and access to finance	Strategic Management Journal	1221	135.7	30.07	612	1995
2	Govindan et al., 2013 [60]	A fuzzy multi-criteria approach for measuring the sustainability performance of a supplier based on a triple-bottom-line approach	Journal of Cleaner Production	688	68.8	17.78	257	1005
3	Labuschagne et al., 2005 [61]	Assessing the sustainability performances of industries	Journal of Cleaner Production	636	35.3	7.73	129	1283
4	Hutchins and John, 2008 [62]	An exploration of measures of social sustainability and their application to supply chain decisions	Journal of Cleaner Production	619	41.3	5.48	304	1364
5	Seelos and Johanna, 2005 [63]	Social entrepreneurship: Creating new business models to serve the poor	Business Horizons	609	33.8	2.78	488	1906
6	Fischer and Richard, 2008 [64]	Environmental and technology policies for climate mitigation	Journal of Environmental Economics and Management	537	35.8	12.92	71	589
7	Haas et al., 2015 [65]	How circular is the global economy?: An assessment of material flows, waste production, and recycling in the European Union and the world in 2005	Journal of Industrial Ecology	496	62	28.76	380	1512

Table 3. *Cont.*

№	Authors/Year	Title	Source	TC	TC Per Year	FWCI	PlumX Metrics	
							Captures (Export-Saves)	Readers
8	Dao et al., 2011 [66]	From green to sustainability: Information Technology and an integrated sustainability framework	Journal of Strategic Information Systems	428	35.7	11.43	45	1131
9	Steurer et al., 2005 [67]	Corporations, stakeholders and sustainable development I: A theoretical exploration of business-society relations	Journal of Business Ethics	425	23.6	6.35	464	950
10	Yuan et al., 2008 [68]	Energy consumption and economic growth: Evidence from China at both aggregated and disaggregated levels	Energy Economics	420	28	8.33	108	298

Note: TC—Total citation; FWCI—Field-Weighted citation impact.

Table 4. Top 10 dominant authors according to Scopus, 2000–2022.

№	Authors	No. of Papers/Total	% of Articles	Coauthors	TC	PY Start	h-Index	Country
1	García-Sánchez Isabel María	14/197	7%	75	7871	2006	46	Spain
2	Khan Syed Abdul Rehman	10/155	6%	150	4437	2016	41	China
3	Streimikiene Dalia	10/487	2%	150	8345	2005	45	Lithuania
4	Streimikis Justas	9/64	14%	130	696	2017	16	Poland
5	Bilan Yuriy	8/190	4%	150	2776	2008	31	Poland
6	Sinha Avik	8/94	9%	121	5070	2014	38	India
7	Zaman Khalid	7/259	3%	150	5878	2008	42	Pakistan
8	Alola Andrew Adewale	6/135	4%	119	3927	2008	31	Finland
9	Amor-Esteban Víctor	6/17	35%	28	202	2018	9	Spain
10	Clark Woodrow W.	6/116	5%	89	811	1994	16	USA

Note: TC—Total citation; PY start—publication year start. Sources: developed by the authors.

Thus, the Spanish scholar García-Sánchez Isabel María, with 14 out of 197 articles, leads this list. The scholar's coauthorship network consisted of 75 co-authors. Most documents were published in the scientific journal 'Corporate social responsibility and environmental management'. Compared to the other scholars from the list, Gar-cía-Sánchez Isabel María has the highest h-index—46 points. Chinese scholar Khan Syed Abdul Rehman (h-index—41) and Lithuanian scholar Streimikiene Dalia (h-index—45) shared second place. They have published 10 articles on the analyzed topic. Streimikiene Dalia is the most cited scholar on the list. The Polish scholar Streimikis Justas, with 9 articles and 696 citations, ranked third. Notably, 35% of the Spanish scholar Amor-Esteban Víctor is devoted to corporate social responsibility under the SDGs. Table 5 lists the top 10 out of 417 sources (journals, books, etc.) most contributed to the development of the topic on the linkages between corporate social responsibility and renewable energy development for the green brand within SDGs.

The UK journal 'Journal of Cleaner Production' came at the top (h-index is 232). However, the share of journal publications on the investigated topic is only 1.4%. In turn, the most significant share of publications had scientific journals 'Corporate Social Responsibility and Environmental Management' (10.7%) and 'Energy Sustainability and Society' (7%). It stands to mention that all journals have a high impact factor (Q1). The actual citations of all sources exceeded the expected citations for the sources' subject fields (SNIP 2021 metric). At the same time, the average number of citations received per

document is the highest in the Netherlands journal 'Resources Conservation and Recycling' (CiteScore 2021 is 17.9). The findings showed that 2381 affiliated institutions were engaged in research on the linkages between corporate social responsibility and renewable energy development for the green brand within the SDGs. Table 6 shows the list of the top 10 affiliated institutions worldwide that have published the largest number of articles according to the filtered Scopus dataset.

Table 5. The most prolific sources according to Scopus, 2000–2022.

№	Sources	No. of Papers/Total	% of Articles	Country	h-Index	SNIP 2021	Cite Score 2021	SJR 2021/Q
1	Journal of Cleaner Production	447/32,542	1.4	UK	232	2.444	15.8	1.92/Q1
2	Sustainability (Switzerland)	211/56,357	0.4	Switzerland	109	1.310	5.0	0.67/Q1
3	Corporate Social Responsibility and Environmental Management	133/1248	10.7	UK	82	2.044	11.5	1.95/Q1
4	Business Strategy and the Environment	70/2004	3.5	UK	115	2.289	11.9	2.24/Q1
5	Sustainable Development	54/1274	4.2	UK	70	1.655	9.6	1.32/Q1
6	Energy for Sustainable Development	45/1628	2.8	Netherlands	69	1.802	9.8	1.44/Q1
7	Resources Conservation and Recycling	38/5504	0.7	Netherlands	150	2.943	17.9	2.59/Q1
8	Resources Policy	37/3344	1.1	UK	80	1.996	7.6	1.46/Q1
9	Technological Forecasting and Social Change	34/6639	0.5	USA	134	3.097	13.7	2.34/Q1
10	Energy Sustainability and Society	29/413	7	USA	30	1.295	6.4	1.03/Q1

Table 6. Top affiliated institutions according to Scopus data, 2000–2022.

№	Institution	No. of Articles	Total Number of Authors	Country
1	North China Electric Power University	25	16,281	China
2	University of Salamanca	20	7312	Spain
3	Utrecht University	19	17,212	Netherlands
4	Tsinghua University	18	74,740	China
5	University of Zaragoza	18	9473	Spain
6	Lappeenranta University of Technology	15	1942	Finland
7	University of East Anglia	15	6185	UK
8	University of South Australia	15	25,285	Australia
9	University of Groningen	14	14,931	Netherlands
10	Beijing Normal University	13	21,807	China

Among them, two organizations are from China (North China Electric Power University and Tsinghua University), Spain (the University of Salamanca and the University of Zaragoza), and the Netherlands (Utrecht University and the University of Groningen), and one is from Finland (Lappeenranta University of Technology), the UK (University of East

Anglia), and Australia (University of South Australia). At the same time, the most prolific affiliated institution was the North China Electric Power University (China), the scholar of which published 25 articles. On average, one affiliated institution published 0.84 articles.

This research browsed publications by country. Figure 5 shows the higher presence of articles in China (578 articles), followed by the UK (354 articles), the USA (326 articles), and Spain (309 articles). Italy, the Netherlands, Australia, Germany, Canada, and India have fewer than 300 articles. On the other hand, the average citations per article show that the most cited are articles by Canadian (64.5 citations) and USA (62.6 citations) scholars.

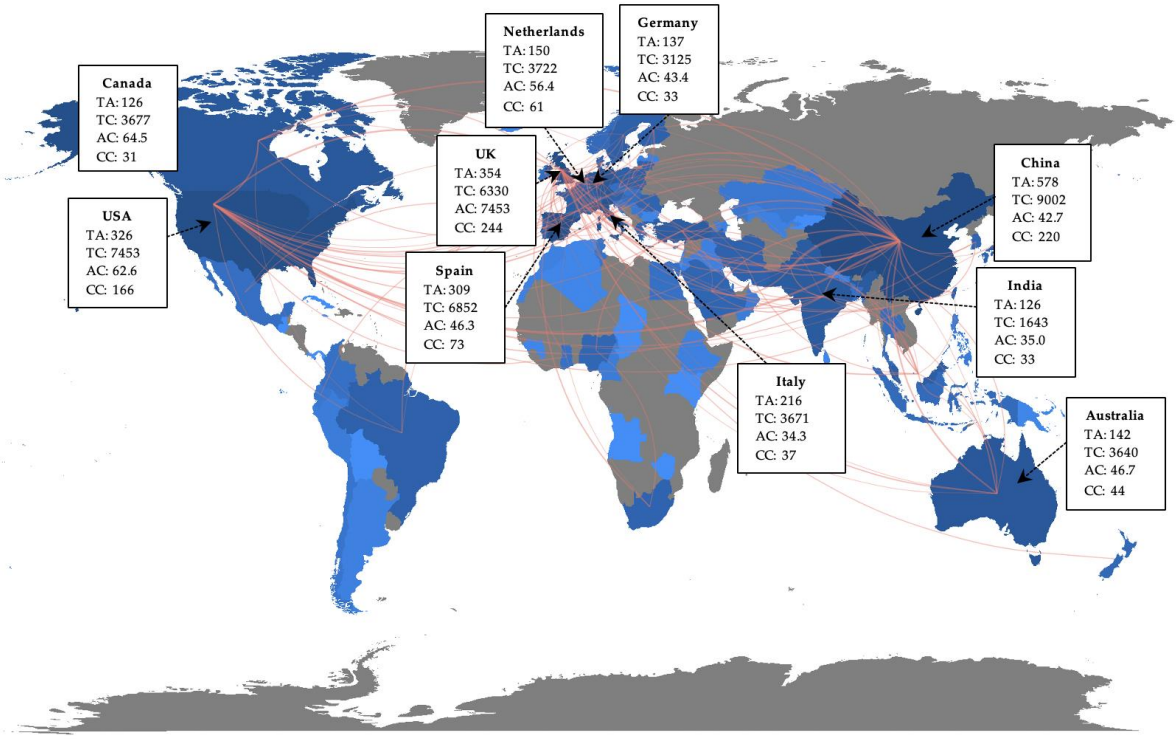

Figure 5. Country collaboration WorldMap according to Scopus data, 2000–2022. Notes: TA—total number of articles; TC—total citations; AC—average article citations; CC—the number of collaborated countries.

In turn, the UK has the most extensive coauthorship network among the considered countries (244 collaborations). The UK scholars mainly collaborated with researchers from China (26 interactions), Italy (17 interactions), the USA (15 interactions), and Germany (14 interactions). In turn, the Chinese collaboration network consists of 220 interactions. The scholars mainly collaborated with researchers from Pakistan (46 interactions). The USA authors have collaborated mostly with Chinese scholars (30 interactions). At the same time, Canada, the Netherlands, Germany, Spain, Italy, Australia, and India have a small collaboration network (fewer than 100 interactions).

This research investigated the typology of the themes in the filtered Scopus dataset using the toolkit of Biblioshinity for bibliometrics. The thematic map exploits the KeyWords Plus field since it allows us to capture the articles' content with greater depth and variety. The thematic map parameters include several limitations: (1) the minimal cluster frequency is 10 words; (2) the number of labels per cluster is 3 keywords; and (3) the label size is 0.2.

Thus, Figure 6 visualizes five clusters unveiling five different typologies of the themes. The upper-right quadrant with high centrality and density keywords visualizes the motor themes: renewable energy resources and environmental impact. These themes are considered to be more developed and influential in the subject area under investigation. The findings [10,11,15] show that the theme 'Renewable energy resources' is analyzed from the perspectives of climate change energy management, energy policy, energy efficiency,

solar energy, investments, energy security, renewable energy technologies, intelligent buildings, climate change mitigation, renewable energy projects, electric power transmission networks, etc.

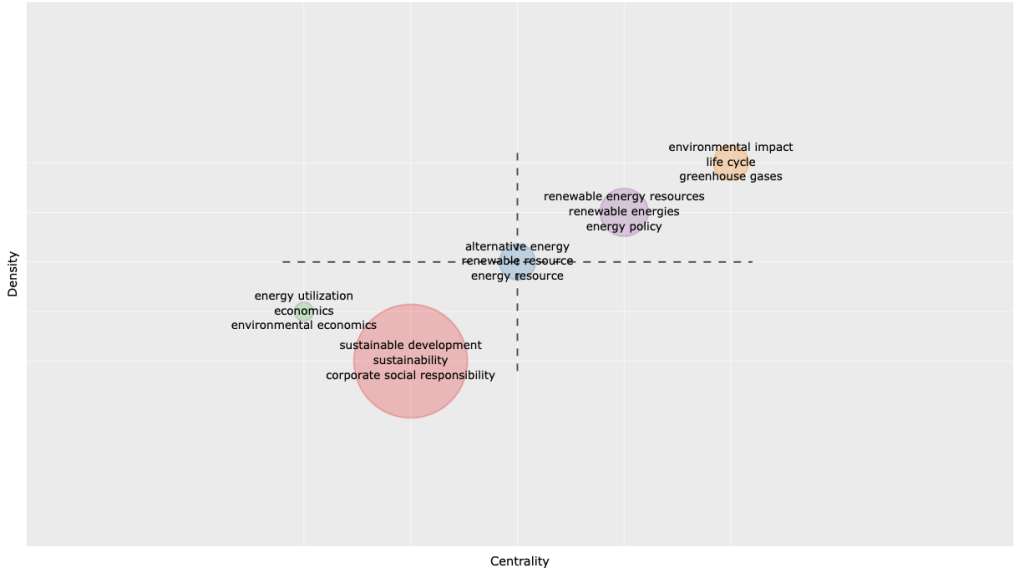

Figure 6. Thematic map.

On the other hand, the theme 'Environmental impact' is investigated from the perspectives of carbon footprint, circular economy, recycling, resource use, waste disposal and treatment, energy consumption, sustainable energy, greenhouse gases, environmental performance, environmental technology, nonrenewable energy, environmental sustainability, renewable energy, sustainability assessment, etc. [2,69,70].

The lower-left quadrant with low centrality and density keywords unveils the primary themes. Thus, the themes 'Energy utilization' and 'Sustainable development' are considered to be fundamental in the studied scientific field. The findings [10,11,14,15,31,32] showed that 'energy utilization' is related to carbon dioxide, emission control, environmental economics, economic activity, energy utilization, environmental protection, economic growth, environmental quality, low carbon economy, globalization, renewable energy consumption, environmental problems, urbanization policy approach, etc.

The theme 'Sustainable development' relates to different concepts, such as corporate social responsibility, economic and social effects, investment and finance, pollution control, international trade, industrial performance, social responsibilities, consumption behavior, environmental regulations, green economy, cleaner production, marketing, product design, ecodesign, sustainable business, technology transfer, sustainable practices, etc. Notably, the theme 'Alternative energy' is located at the intersection of four quadrants. This means that this theme is well-developed and remains the leading theme within the investigated field. This theme is mainly examined under the issues of renewable resources, energy use, environmental policy, energy planning, electricity generation, solar power, economic development, greenhouse gas, energy market, policy making, technological development, energy transitions, smart city, building, etc.

Figure 7 visualizes the keyword co-occurrences map, which defines the main scientific areas (clusters) in the investigated scope of literature from 2000 to 2022.

The keyword co-occurrences network map was built after analyzing the data on the keywords' links, total link strengths, and occurrence. The limitation of a minimum of 7 keyword co-occurrences was applied. As a result, 143 keywords out of 6122 met the threshold. These keywords created 4 clusters. These clusters were named by the cluster's core keyword according to the largest number of occurrences, links, and total link strengths. Therefore, the first cluster (red) detects the research direction on sustainable

development and corporate social responsibility, the second (blue) on renewable energy, the third (green) on green marketing, and the fourth (yellow) on environmental sustainability. On the other hand, the number of links was detected to explore the terms used with the analyzed keywords. Thus, Figure 7 shows that in the researched scope of literature, the keyword 'green brand' belongs to the green cluster lead with the item 'green marketing'. Figure 7 shows the studies devoted to 'green brand' considering the following issues: 'green marketing', 'social media', 'firm performance', 'ethics', 'green trust', 'corporate social responsibility', 'innovation', 'brand image', 'brand equity', 'green brand loyalty', 'green innovation', 'green satisfaction', and 'purchase intention' [43,56,59].

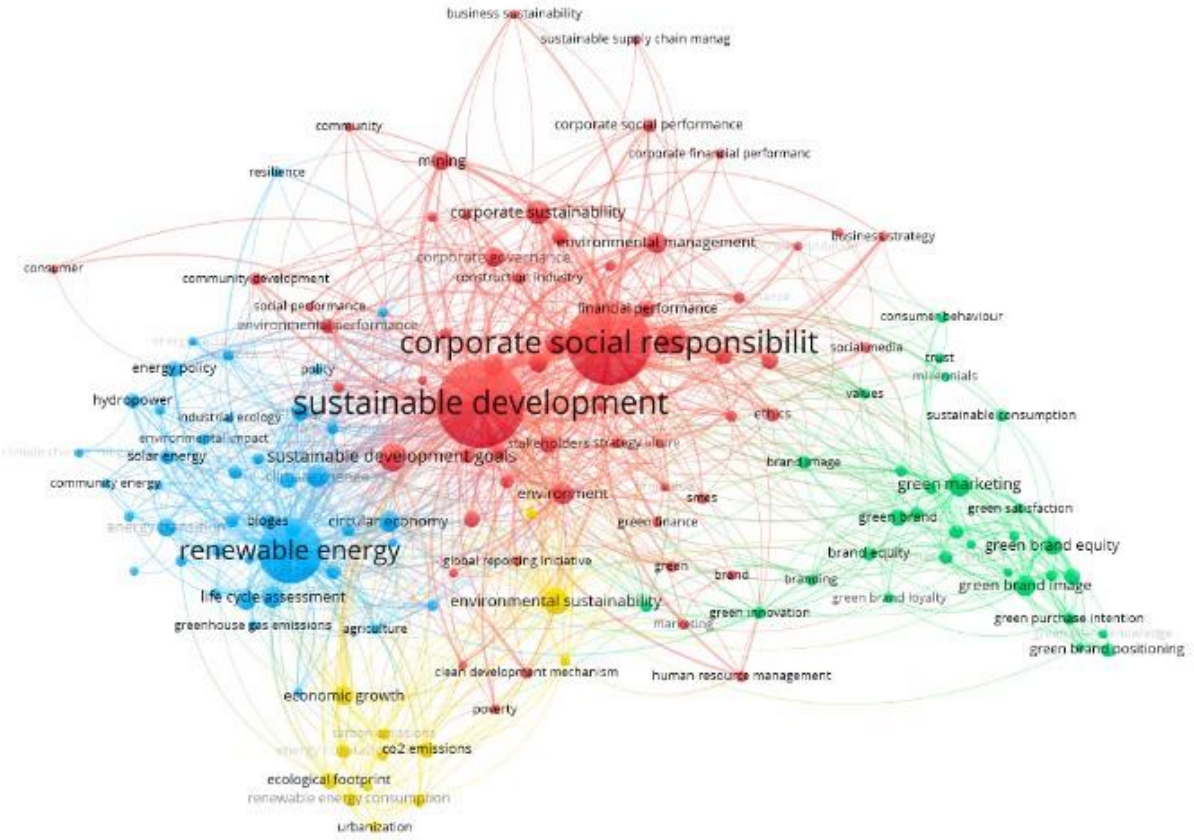

Figure 7. Network visualization of keyword co-occurrences according to Scopus data, 2000–2022.

In turn, the findings show that the keywords 'corporate social responsibility and 'sustainable development' belong to the red cluster covering 59 items. Thus, the keyword 'sustainable development' leads to the orange cluster created with 8 items. In the analyzed scope of scientific papers, 'sustainable development' met 111 other items. This keyword has the highest link strength with the items 'corporate social responsibility', 'stakeholder engagement', 'environmental policy', 'renewable energy', 'environmental management, 'environment', 'economic growth', 'climate change', etc. [24–29]

In turn, the keyword 'corporate social responsibility' met with 91 other terms. Herewith, the terms with the highest link strength are as follows: 'sustainable development, 'stakeholder engagement', 'environmental management', 'sustainable development goals', 'environmental policy', 'sustainability reporting', 'business ethics', 'corporate social performance', 'environmental sustainability', 'financial performance', 'stakeholder engagement', and 'stakeholders' [41,44,67,68].

Concerning the literature, the findings on the manufacturing industries of Pakistan showed that corporate social responsibility positively impacts environmentally sustainable development [71]. Therefore, scholars have highlighted the necessity of implementing corporate social responsibility activities in organizational strategies to promote green inno-

vation. Existing research on this topic demonstrates academic interest in green finance and green economic growth [72,73]. A large stream of literature supports the positive influence of sustainable development on a company's financial performance. Cheng et al. [59] stated that social and environmental factors of corporate social responsibility increase access to finance. Having analyzed large US nonfinancial companies, Lo and Sheu [74] found a positive nexus between corporate social responsibility and its market value that attracts investors. In turn, Lin et al. [75] specified that corporate social responsibility positively impacts a company's financial performance in the long term rather than in the short term.

The keyword 'renewable energy' belongs to the blue cluster consisting of 41 items. In the analyzed papers, 'renewable energy' met with 70 other items. This keyword has the highest link strength with the items as follows: 'sustainable development', 'energy efficiency', 'climate change', 'energy transition', 'environmental sustainability', 'hydropower', 'economic growth', 'ecological footprint', 'wind energy', and 'energy policy'.

Several recent studies consider renewable energy to be significant in ensuring national energy security and environmental sustainability. However, there is still a dispute on the role of renewable energy in economic welfare. In this view, In-glesi-Lotz [76] analyzed the influence of renewable energy consumption on economic growth. Having applied panel data techniques, scholars have found that renewable energy consumption has a significant positive impact on environmental sustainability and economic prosperity. Moreover, the above findings are supported by the study by Destek and Shinha [69]. The authors concluded that the growth of renewable energy consumption decreases the ecological footprint. In contrast, nonrenewable energy consumption contributes to environmental degradation.

In contrast, the keywords 'renewable energy' and 'corporate social responsibility' co-occurred only 3 times in the analyzed studies. In this line, it is appropriate to mention the study by Tiep et al. [77], who applied qualitative and quantitative methodologies to measure the influence of corporate social responsibility on sustainable energy development under the mediating role of renewable energy resources and sustainable energy supply. In the case of Vietnam, scholars have confirmed the positive direct impact of corporate social responsibility on sustainable energy development. Moreover, they concluded that sustaining the energy supply and using renewable energy resources significantly impact sustainable energy development. In turn, Atiff et al. [78] considered the gender aspects of environmental corporate social responsibility. The scholars concluded that board gender diversity promotes renewable energy consumption in US firms.

4. Conclusions and Discussion

Research on green branding is growing, but this topic is quite narrow. In this view, this paper applied bibliometric methods to explore the influence of corporate social responsibility and renewable energy development on the green brand within the SDGs. The main advantage of bibliometric analysis is ensuring that the quantitative rigor literature review avoids the authors' intrinsic subjectivity. In turn, knowledge visualization techniques draw a comprehensive picture of growing trends and potential research opportunities in the investigated research field.

The initial statistics show the growing academic interest in the investigated topic. Herewith, the first splash of publication activity was in 2005. This could result from the Kyoto Protocol enters into force, which sparked scholars' interest in exploring the possibilities of greenhouse gas emission reduction.

The findings of performance and intellectual analysis indicated that the Spanish scholar García-Sánchez Isabel María made the biggest contribution to the development of the analyzed topic. In turn, most documents were published in the scientific journals 'Corporate social responsibility and environmental management' and 'Energy Sustainability and Society'. In general, 2381 affiliated institutions were engaged in research on the linkages between corporate social responsibility and renewable energy development for the green brand within the SDGs. However, according to the filtered Scopus dataset, North China Electric Power University (China), the scholar which published 25 articles, published

the largest number of articles. At the same time, the higher presence of articles is in China (578 articles), followed by the UK (354 articles), the USA (326 articles), and Spain (309 articles). On the other hand, the UK has the most extensive coauthorship network, mainly collaborating with researchers from China (26 interactions), Italy (17 interactions), the USA (15 interactions), and Germany (14 interactions). In turn, the Chinese collaboration network consists of 220 interactions. The scholars mainly collaborated with researchers from Pakistan (46 interactions). The USA authors have collaborated mostly with Chinese scholars (30 interactions).

The co-word network analysis and clustering defined five different typologies of the themes by the examined keywords. Thus, more developed and influential in the subject area (motor) themes are renewable energy resources and environmental impact. Scholars have analyzed renewable energy issues from the perspectives of climate change energy management, energy policy, energy efficiency, solar energy, investments, energy security, renewable energy technologies, intelligent buildings, climate change mitigation, renewable energy projects, electric power transmission networks, etc. Such conclusions are coherent with past studies [70,79]. In turn, the research on environmental impact covered the issues of carbon footprint, circular economy, recycling, resource use, waste disposal and treatment, energy consumption, sustainable energy, greenhouse gases, environmental performance, environmental technology, nonrenewable energy, environmental sustainability, renewable energy, sustainability assessment, etc.

The fundamental themes in the studied scientific field are energy utilization and sustainable development. Research on energy utilization covers the issues of carbon dioxide, emission control, environmental economics, economic activity, energy utilization, environmental protection, economic growth, environmental quality, low carbon economy, globalization, renewable energy consumption, environmental problems, urbanization policy approach, etc.

In turn, the issues devoted to sustainable development were studied regarding corporate social responsibility, economic and social effects, investment and finance, pollution control, international trade, industrial performance, social responsibilities, consumption behavior, environmental regulations, green economy, cleaner production, marketing, product design, ecodesign, sustainable business, technology transfer, sustainable practices, etc.

The theme 'Alternative energy' is well developed. At the same time, this theme remains the leading theme within the investigated field. Alternative energy issues were mainly examined under the issues of renewable resources, energy use, environmental policy, energy planning, electricity generation, solar power, economic development, greenhouse gas, energy market, policy making, technological development, energy transitions, smart city, building, etc.

Furthermore, the keyword co-occurrences map allowed us to detect the main research directions in the investigated scope of literature from 2000 to 2022. Thus, the most influential research directions are considered to be sustainable development and corporate social responsibility, renewable energy, green marketing, and environmental sustainability.

This paper offers some theoretical implications by analyzing and visualizing the investigated scientific output. In addition, this study makes some practical contributions. To analyze and map academic production concerning the performance of academics, institutions, and academic journals, this study uses various bibliometric analysis techniques. This article presents detailed instructions for scholars who wish to undertake bibliometric analyses concerning scholarly output in different contexts. Additionally, researchers could exploit and expand their current study directions using the findings of this paper.

However, it stands to mention that the findings of this study are limited since they consider only data from the Scopus database. In addition, this research works only with articles and excludes conference proceedings, book chapters, books, reviews, reports, dissertations, etc. Although Scopus allows for covering the global research output to deliver a comprehensive critical overview of the analyzed topic, it is appropriate for further studies involving a wider data range. This study limits papers on languages that eliminate

publications in other languages than English. Thus, further investigations should consider other languages. Besides, it is necessary to extend the number of papers and include the least cited papers which allows identifying the new trends in the investigation of CSR, renewable energy development, and green brands within SDGs. It should be noted that it is necessary to extend bibliometric techniques to obtain more reliable results in further investigations. Further research should be based on analysis of each individual category (corporate social responsibilities, green brand, renewable energies, sustainable development goals) to explore the deeper relationship between them.

Author Contributions: Conceptualization, T.P.; methodology, O.L., T.P. and Y.U.; software, Y.U.; validation, T.P. and O.L.; formal analysis, O.L., T.P. and Y.U.; investigation, Y.U.; resources, Y.U.; data curation, Y.U.; writing—original draft preparation, O.L., T.P. and Y.U.; writing—review and editing, T.P. and O.L.; visualization, Y.U.; supervision, T.P.; project administration, T.P.; funding acquisition, T.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the project "Green investing: cointegration model of transmission ESG effects in the chain "green brand of Ukraine—social responsibility of business" (0121U100468, Ministry of Education and Science of Ukraine).

Data Availability Statement: Not applicable.

Acknowledgments: The authors are very grateful to the International Visegrad Fund which support the project "Carbon free economy: the best practices between the V4 and Ukraine". This paper contains the results which are received within this project.

Conflicts of Interest: The authors declare no conflict of interest.

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