

# Energy Use, Corporate Social Responsibility and Tourism: Most Outstanding Topics, Sources, and Authors

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**Abstract:** The concern for energy use and energy efficiency is a question of vital relevance and urgency in the current world. A search in Google Scholar with the term “energy use” produces more than 2 million results. If the search is restricted to the term “tourism,” more than 220,000 results are obtained and if we use together with the terms “energy use” and “corporate social responsibility” (CSR), we get more than 19,000 results. Nevertheless, the authors have been unable to identify scientific studies centered on the problem of energy use in the area of the tourist sector and CSR. The aim of this paper is to identify the most usual subjects or topics which appear in the scientific literature analyzed, evaluate the documentary sources that show a greater degree of presence and which can be considered as more relevant and influential and to point out who is the most relevant and prestigious authors who are currently writing about the topics considered.

**Keywords:** Energy; Corporate social responsibility; Tourism; Bibliometric analysis

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## 1. Introduction

The concern for energy use and energy efficiency is a question of vital relevance and urgency in the current world. It is part of the interests of international organizations, such as the World Energy Council, the International Energy Agency (<http://www.iea.org/>), the World Energy Efficiency Association (<http://www.its.org/ztlinks/world-energy-efficiency-association>), and of international meetings, such as the World Future Energy Summit<sup>[1]</sup>, held in Abu Dabi in 2017.

We also find this preoccupation in the legislation of different public organizations. Thus, the European Economic Community (EEC) and then the European Union (EU) developed different regulatory initiatives from 1993: The Directive 93/76/EEC of the Council, of September 13, 1993, related to the limitation of carbon dioxide emissions through the improvement of energy efficiency; the Directive 2006/32/EC of the European Parliament and the Council of April 2006 about the end-use efficiency of energy and energy services and for which the norm of 1993 was repealed; to recently emitting the norm currently in force; and the Directive 2012/27/EU related to energy efficiency. This norm was slightly modified in 2013 to adapt it to the accession of Croatia to the EU through the Directive 2013/12/EU. An interpretive guide of these directives was also elaborated for the member states<sup>[2]</sup>.

Diverse reglementary initiatives have also been worked out to develop the contents of these directives. Thereby, in Spain the government issued the Royal Decree-law 8/2014, on July 4, passing urgent measures for growth, competitiveness, and efficiency. This establishes the system of obligations of the energy suppliers. Another aspect to highlight

the topic in our country is related to public and private organizations. Among them, we can highlight the Institute for the Diversification and Saving of Energy (<http://www.idae.es/>), the National Commission of Markets and Competition (<https://www.cnmc.es/ambitos-de-actuacion/energia>), the Association of Renewable Energy Producers (<http://www.appa.es/>), and the Spanish Association of Energy Management (EnerAgen, <http://www.eneragen.org/es/>).

An interest in the use of energy in an efficient and sustainable manner also has a significant place in the area of scientific research. A search in Google Scholar with the term “energy use” produces more than 2 million results and almost this amount when patents and citations are removed. If the search is restricted to the term “tourism,” more than 220,000 results are obtained. If we use together with the terms “energy use” and “corporate social responsibility” (CSR), we get more than 19,000 results.

In the review of the scientific literature on energy use, we have identified diverse works which deal with the problem of the use of energy and its efficiency. We have also identified bibliometric reviews on research in tourism, as well as in relation with CSR. Nevertheless, the authors have been unable to identify scientific studies centered on the problem of energy use in the area of the tourist sector and CSR. This work is specifically confined to the academic literature which tackles the topics of energy use from a business angle and specifically in relation with the development of tourist activities and/or the focus of business social responsibility. The specific aims sought in this paper are the following. First, to identify the most usual subjects or topics which appear in the scientific literature analyzed and second, to present and evaluate the documentary sources that show a greater degree of presence and which can be considered as more relevant and influential. Third, to point out who is the most relevant and prestigious authors are who are currently writing about the topics considered. Finally, to offer to new readers concerning the subjects of energy use in tourist areas and CSR a brief guide of what their bibliographic sources should be when starting their activity in this study field.

The rest of the article is structured as follows. First, we present the state-of-the-art as to bibliometric research on the topics “energy use,” “tourism,” and “CSR,” beginning with a brief run through of the problems of bibliometric studies in general. After, we set out the most relevant aspects of the methodological designs used in this work, indicating documentary sources, data treatment tools, procedures followed to refine and homogenize the information obtained, etc. The following section is focused on exposing the main results attained through data analysis. Finally, we propose the principal conclusions, implications, limitations, and future research lines.

## 2. Literature Review

This part of our work is divided into two sub-sections. First, we present what bibliometric analysis is, what objectives it seeks and what instruments are used in it. Then, we briefly run through the scientific research which has used the bibliometric analysis technique in the three topics of interest of our research: “Energy use,” “tourism,” and “CSR.”

### 2.1. Bibliometric analysis

According to some authors<sup>[3]</sup>, bibliometrics is a part of information science or scientometrics. The bibliometric technique enables the analysis and description of written communication, irrespective of the media in which it has been published: books scientific journals, theses, end of term works, monographs, publications in internet, etc. The technique, through a mathematical and statistical analysis, allows the quantitative evaluation of the written production. This is why it must observe and study a set of parameters, such as the type of methodology used, the profile of the bibliographic references, the gender of the authors, the institutions that they belong to, and the academic level of the researchers<sup>[3,4]</sup>. Bibliometrics is the part of scientometrics which uses mathematical and statistical methods to study scientific publications, the people who produce them and the references that they are made up of. The aim of this study is to obtain information on the behavior deployed by science and the scientists.

One cannot speak about a consensus in the scientific community concerning the concept and definition of bibliometrics. In the words of Jiménez-Contreras<sup>[5]</sup>, “the definitions and the denominations which this area of research has received in the past 30 years have been as numerous as, given their reiteration, apparently unsatisfactory.” Now, it is possible to identify two areas of concordance among the different definitions: (1) The mathematical-statistical methodology (quantitative) to use and (2) the object of the analysis (the documentary sets, their products, and their consumers, or users).

It is important to indicate that the term bibliometrics is closely related with two others: Informetrics and scientometrics<sup>[6-8]</sup>. “The terms bibliometrics, informetrics, scientometrics, and librmetrics are derived from the fusion of the term ‘metrics’ with bibliography, information, science, and library, respectively. These terms are analogous, or rather synonymous, in nature, and their major scope and application involve different facets of library and information science. All these terms are directly related to measuring knowledge, which, in turn, depends solely on the generation of new ideas developed through well-built information communication channels, whose primary aim is to ensure rapid collection and dissemination of the most important information for the generators of knowledge ...”<sup>[8]</sup>.

The techniques of bibliometric analysis facilitate the knowledge of the quantitative product, and the dissemination and the use of the information registered<sup>[9]</sup>, creating and developing mathematical patterns and models which allow the measuring of these processes. The results obtained are useful to elaborate predictions and to support decision making.

In bibliometric studies on scientific production, two large groups of indicators appear<sup>[10,11]</sup>: Indicators of activity and of relation. The indicators of activity enable the observation and identification of the quantitative evolution of literature, the discovery of the most notable publications, of the institutions and the researchers with greater productivity, and the methodologies used. The indicators of relation allow studying the contents, recognizing the interconnections existing between subjects and discovering the emerging research lines<sup>[12-14]</sup>. On the other hand, among the indicators of activity, one can talk of indicators of production (based on the count of publications) and indicators of impact or visibility (based on the count of citations). The use of indicators of activity means that the development of the science is a normal productive activity, two aspects need to be considered: Inputs (elements and resources used in the activity) and outputs (results of the activity). The goal of the analysis is to measure both aspects, to study the relations between them, and to evaluate the performance obtained. These are tasks which is not easy and are subject to numerous moderator influences, given the complexity of the scientific processes and the acquirement of knowledge<sup>[15]</sup>. This is why they are only going to measure the results of the research, without taking into consideration the inputs.

The use of indicators of activity in bibliometric analysis is based on a series of suppositions<sup>[16,17]</sup>: (a) The value and quality of a specific scientific work depend on the opinion and reaction of other scientists (both contemporary and a little later on); (b) all scientific research leaves an observable and identifiable trace in literature; (c) to examine all the works published in journals offers information about the science, specifically from the bibliography used and referenced or cited; (d) the databases enable the detecting of the most relevant publications; (e) the simple count of publications permits the measuring of the scientific production; and (f) the value of a publication can be measured by the number of citations that it receives.

The regularities present in scientific publications make up the so-called “bibliometric laws.” There are five very relevant laws<sup>[18-20]</sup>: The law of exponential growth of scientific information; the law of obsolescence or aging; Bradford’s law of dispersion; the law of least effort or Zipf’s law; and, finally, the law of productivity of scientific authors or Lotka’s law.

The law of exponential growth of scientific information points out that its growth rate is much higher than that of observed for other processes or social phenomena: Every 10 or 15 years the quantity of information available is duplicated<sup>[18,19]</sup>. The law of obsolescence or aging refers to the tremendous speed with which scientific literature ceases to be relevant: The older a scientific resource is, the less frequently it is cited. This takes place gradually.

The law of dispersion of scientific literature, presented by Bradford, indicates that most scientific works related to a discipline tend to be concentrated in a small number of journals. It can also be applied to academic institutions and the researchers or authors themselves. In this sense, three large zones of scientific production tend to be identified (each one of them represents a third of the total production): The core, where the institutions or authors with a greater production are found; zone 1 (authors or institutions with an intermediate or moderate scientific production); and, finally, zone 2 (institutions or authors with little scientific production).

The law of least effort, enunciated by Zipf, highlights the tendency of each author to use a certain group of words in all their texts. In other words, each word present in the vocabulary of an author shows, in the long run, a specific probability of occurrence.

Finally, Lotka’s law or the law of proactivity of scientific authors: Only a few authors are responsible for most scientific works. The law says that as the number of scientific works relative to a specific matter grows, the number of their

authors decreases<sup>[21]</sup>. To fulfill this law, the data obtained must be confined to a sole documentary source (a single journal, for example) and to the first authors who have published their works in a minimum period of 10 years<sup>[15]</sup>.

## 2.2. Experiences of bibliometric analysis of activity on energy use, tourism, and CSR

We now tackle the review of scientific works which have used bibliometric analysis in the areas of tourism, CSR, and energy use. We begin with the studies on energy use and/or energy efficiency, we continue with scientific research centered on tourism and we finish with the works based on CSR.

### 2.2.1. Bibliometric analysis on energy, its use, and its efficiency

Fifteen studies on energy use from a bibliometric perspective have been detected by the authors of this work. These investigations have taken place between 2007 and 2018, although the period of greatest production was 2017 with four different publications.

These works can be classified into diverse categories or subjects of interest. The most frequent are those related to renewable energies (in general, or specifically about solar and/or wind) with a total of four publications, and energy efficiency with three works. After, we have research centered on aspects such as energy generation or cogeneration (2 articles), energy in general, energy management, energy poverty, clean production systems and, finally, the relationship between sustainability and energy.

The publications related to renewable energies began with the work of Sakata *et al.*<sup>[22]</sup> on the collaboration guidelines between researchers concerning renewable energies, specifically solar and wind energy. Then, in 2014 there are two articles: One by Woon *et al.*<sup>[23]</sup> and the other by Du *et al.*<sup>[24]</sup> and Woon *et al.*<sup>[23]</sup> research is centered on analyzing the Scopus database in relation with the term “renewable energy.” The authors identified 500 keywords relevant to the domain of renewable energies and more than 119,000 documents. Du *et al.*'s work are focused on the research about solar energy published in the web of science (WoS) between 1992 and 2011, a strong increase in it over time is noted, as well as a notable growth of the number of researchers and institutions involved in this development. The authors also observe predominance in the research of works carried out by researchers from U.S.A., China, and India. They also analyze the most recurring research subjects, the most influential journals, and the most cited documents. The last publication on renewable energies is from 2018<sup>[25]</sup> and is centered on the analysis of the scientific production on photovoltaic solar energy. The authors analyze the scientific production published in WoS between 2007 and 2017, presenting the following interesting results: The time growth of the publications; a strong presence of the United States and Indian researchers, and men; a great diversity of the subjects of interest. They also analyze the most productive authors, the most influential journals and the most cited documents.

In the field of energy efficiency, we have identified three scientific works: Márquez, Du *et al.*, and Dos Santos *et al.*<sup>[26-28]</sup>. The work of Monagas Márquez<sup>[26]</sup> is confined to the research on energy efficiency carried out in the University of Carabobo (Venezuela), measuring the total number of documents and authors, identifying the most productive researchers, as well as the most common topics. The work of Du *et al.*<sup>[27]</sup> analyzes the literature on energy efficiency published in the WoS in the period between 1991 and 2010, detecting a total of 8244 documents. The most relevant findings indicate the importance of the source influence of the North American writers, that the most frequent subjects are “energy and fuels,” “environmental sciences,” and “electrical and electronic engineering” and that the most productive publication is energy policy. For their part, Dos Santos *et al.*<sup>[28]</sup> analyze the subject of energy efficiency in hospitals. Their reference database was CAPES, and 25 useful documents were obtained. The authors noted a time increase of the publications, the predominance of works with a sole author and publications in English and that only one author appears in more than one article.

Palmer *et al.* (2005)<sup>[29]</sup> study on energy cogeneration analyzes the data obtained through the consulting system CAPES about energy generation with a specific methodology between 2010 and 2016. After three filtering stages, the analysis was carried out on 27 different articles, 83 authors, and 278 citations. The results show a similar distribution of publications over time. In López-Bonilla *et al.* (2018)<sup>[30]</sup> work on energy generation between 2013 and 2017 in the Scopus database, the strong influence of China, United States, and India is noted, as well as the relevance of the topics “biomass” and renewable energy.”

Dos Santos *et al.*'s<sup>[31]</sup> work analyzes the Brazilian scientific production on energy in the journals indexed in SciELO during the period of 2000-2007. The authors analyzed a total of 46 articles, written by 144 authors and published in 24 scientific journals. The most common research subjects were “alternative energy sources,” “environmental preservation,” and “R&D in energy.”

Viana *et al.*<sup>[32]</sup> study the literature on energy management with the application of the norm ISO-5001 between 2011 and 2017. In a joint search in the Scopus, SciELO, and WoS databases, the authors identify a total of 42 unique documents. The results show growing tendency of publications over the time horizon analyzed, the predominance of publications in two journals (“strategic planning for energy and the environment” and “journal of cleaner production”), the high presence of U.S. and Russian authors, and the notable frequency of appearance of the keywords “ISO 5001,” “energy management,” and “energy efficiency.”

Li *et al.*<sup>[33]</sup> article on energy poverty, with data published in the WoS between 1981 and 2013, indicates that the subjects of most interest are “fuel access,” “energy efficiency,” “physical health,” “electrification,” and “income poverty.” It also notes a greater concern for this subject in the developed countries than in the developing countries.

Regarding the subject of cleaner production, we have found the work of Giacchetti and Aguiar<sup>[34]</sup> who analyze the Scopus database until 2014 with the term “cleaner production.” The authors identify 4 time periods until 1989, from 1990 to 1999, from 2000 to 2009, and from 2010 onward. Their findings indicate the growing presence of publications over time, the predominance of the journal “Journal of Cleaner Production,” and the low diffusion of authors between periods.

Finally, there is a work on sustainability and energy<sup>[35]</sup> which recuperates documents in the WoS and Scopus databases for the period 2003-2014. After diverse filtering processes of the documents found, the authors end up analyzing 29 articles. The results indicate various things: A gradual increase of the publications in the last years of analysis; only three journals present more than one article (renewable and sustainable energy reviews, *Estudo Avançados*, and *Ecological Economics*); the equality between the research methodologies; the subject most studied is alternative energies.

### **2.2.2. Bibliometrics in the research field of tourism**

We have identified 65 scientific works in the area of studies on tourism which are related bibliometric analysis and tourism. The first investigation dates back to 2005<sup>[36]</sup> while the last from 2018<sup>[37]</sup>, although the most important growth took place since 2013. Both 2015 and 2016 are the years with a greater volume of production. The subjects dealt with in these publications are very diverse: From the relationship between tourism and bibliometrics and the analysis of publications of a specific geographical zone to the study of specific journals, not to mention the identification of the most influential authors of a specific language or country. Some works have related the writings of tourism with other disciplines or specific subjects – marketing<sup>[36,37]</sup>, psychology<sup>[38]</sup>, finance<sup>[39]</sup>, quality<sup>[40]</sup>, and to name only a few of them.

The authors who present most publications in this area are, with five appearances Corral-Marfil; with 4, Benckendorff and Hall; and finally the brothers Lopez-Bonilla with three each.

The most outstanding of these investigations, in relation to the interest of this work, is that none of them tackles either the issue of tourism and energy use or the issue of tourism and CSR.

### **2.2.3. Bibliometric research on CSR**

We have identified a total of 15 studies on CSR which use bibliometric analysis, distributed between 2005<sup>[41]</sup> and 2017<sup>[42]</sup>: One each in 2005, 2008, 2009, 2010, and 2013; two in 2012, 2014, and 2016; three in 2011 and 2015; and eight in 2017. As to the aspects of CSR dealt with, the studies go from CSR in general<sup>[43]</sup> to ethics in business<sup>[44]</sup>, including aspects such as corporate government<sup>[45]</sup>, voluntary service<sup>[46]</sup>, and tourism<sup>[47]</sup>.

In this case, we have not detected any researcher who presents a greater volume of production, although we have found two investigations which relate aspects of CSR with tourist activity: Zanfardini *et al.*<sup>[47]</sup> article, already mentioned, and Sehitoglu *et al.*'s<sup>[48]</sup> work on business ethics in hotels.

The results of the review about bibliometric research on tourism, CSR and energy use highlight the usefulness of dealing with a study of subjects in conjunction to determine to what extent the issue of energy, its use, and its efficiency is present in the research on tourism and the studies on CSR.

### 3. Methodology

In the development of this research work, we have followed the steps suggested by Zupic and Čater<sup>[49]</sup> to carry out a bibliometric analysis, as well as the suggestions offered by de Vasconcelos and Lezana<sup>[50]</sup>. Hence, first, we selected the bibliographic portfolio. This phase is, in turn, made up of the following stages: The choice of the databases to use; the determining of the search criteria; the selection of the relevant documents; the filtering of the documents; and the elaboration of the definitive bibliographic portfolio. The following phase consists of carrying out the bibliometric analysis.

In the first phase, the selection of the bibliographic portfolio, the WoS database was chosen as the place to begin the search for the original documents. Next, we carried out a systematic search with the three basic terms: “energy use,” “CSR,” and “tourism.” After, the documents found in the previous phase were filtered to leave only scientific articles and reviews. These documents were analyzed in greater detail to identify, on the basis of the summary and title of the document, those related with the topics indicated and having a business and economic focus. Finally, the documents chosen were revised to homogenize descriptors, keywords, authors, documentary sources, etc.

The bibliographic portfolio thus obtained was submitted to bibliometric analysis of activity with the aim of identifying the subjects dealt with, the journals in which the articles were originally published and their authors.

### 4. Results

The 213 documents selected are written almost exclusively in English, the exceptions being one in Portuguese (from 2016 and published in *Revista Ambiente Contabil*), and another in Russian (published in economic and social changes-facts trends forecast in 2017).

Figure 1 shows the distribution of the documents analyzed according to their modality. As shown in Figure 1, they are mainly articles (88% exclusively, up to 95% when their combinations with chapters of books and proceedings of congresses are taken into account); there are only 11 reviews, the oldest in 2009, and the most recent in 2017.

The evaluation of the publications over time is shown in Figure 2, noting here their growing evolution. In the 1<sup>st</sup> year, from 1997 to 2008, there is a paucity of scientific production, even inexistent in some years (1999, 2000, and 2006). From 2007 the articles appear uninterruptedly and with an increasing evolution between periods, except for the slight drop in 2016. The first article of the series was published in 1997 in the journal “*Annals of Tourism Research*.” The jump in quantitative terms takes place in 2014, with a total of 20 documents; from then the volume of publications does not drop below this number 2015 (35 documents) and 2017 (43 registers) stand out.

The WoS carries out a classification of the publications into different scientific categories, although the same publication can belong to various categories. Our data produce 394 registers (1.85 per document) for a total of 23 different categories. Among these, “business and economics” accounts for 29.9%, “social sciences - other topics” including tourism contribute 20.6%, and “environmental sciences and ecology” form 18.5%. Categories with less than 18% are; “environmental sciences and ecology,” “science and technology – other topics,” “energy and fuels,” and “engineering.”

Figure 3 presents the volume of documents published in the journals, with a frequency over 3, for a total of 110 different sources (an average of almost two documents per source). An analysis of these in terms of Bradford’s law enables identifying the two zones: The core made up of five journals with more than 5 appearances (4.5% of the sources, 67 registers, and 31.5%);

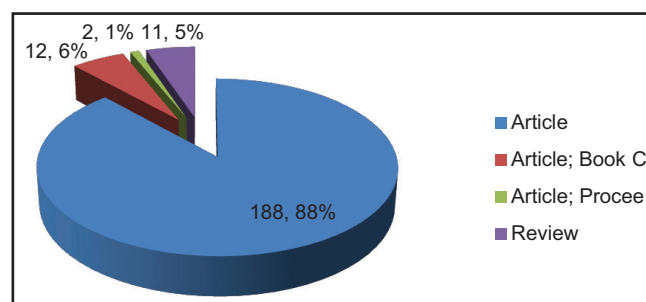
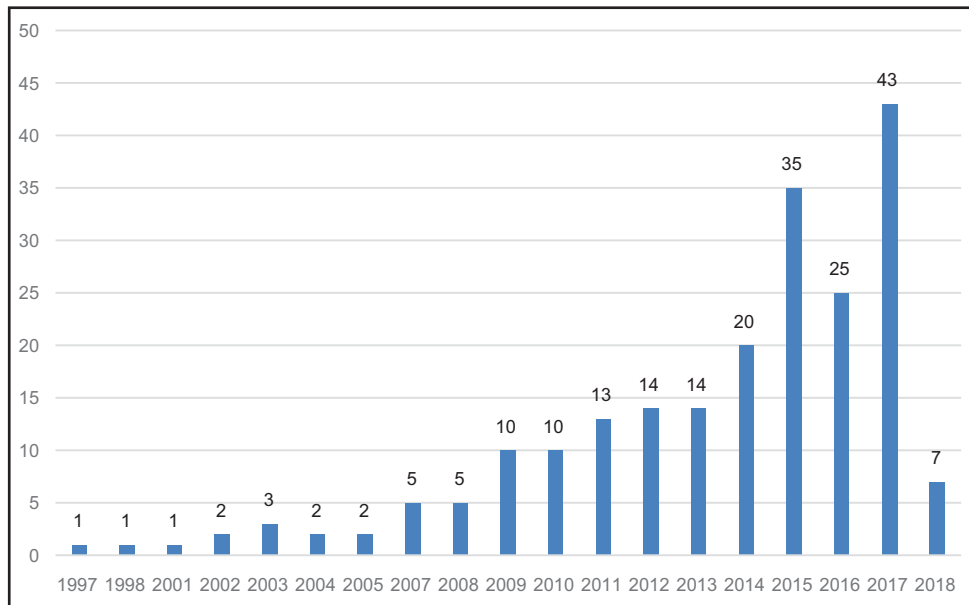
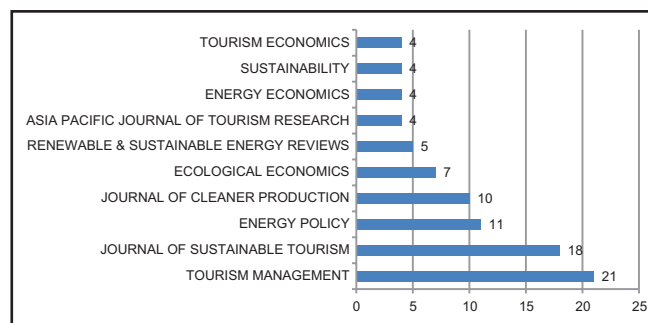


Figure 1. Distribution of documents by modality.



**Figure 2.** Time evolution of the publications.



**Figure 3.** Main journals in which the documents analyzed are published.

zone 1, 24 sources with more than one document and less than seven and is 30.5% of the total (65 registers); and, finally, zone 2, made up of the publications with a single register: Eighty-one of the sources (73% of the sources and 38% of the total documents). The five most relevant journals are “tourism management” (21 documents; 9.9%), “Journal of Sustainable Tourism” (18; 8.5%), “energy policy” (11; 5.2%), “Journal of Cleaner Production” (10; 4.7%), and “ecological economics” (7; 3.3%).

An analysis of the most productive journals in these subjects highlights the presence of the majority of the journals specialized in tourism: “Tourism management,” “Journal of Sustainable Tourism,” “Annals of Tourism Research,” International Journal of Tourism Research, International Journal of Contemporary Hospitality Management, Asia Pacific Journal of Tourism Research, Tourism Economics, International Journal of Hospitality Management, Scandinavian Journal of Hospitality and Tourism, current issues in tourism.

The presence of the main journals which publish research related with CSR is also to be underscored: CSR and environmental management, Social Responsibility Journal, Business Ethics – A European Review, Journal of Business Ethics and Corporate Governance – The International Journal of Business in Society, among others.

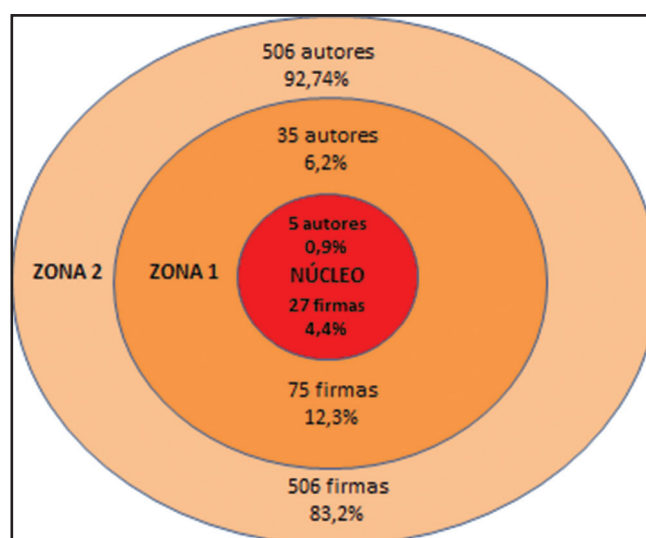
Finally, regarding those publications which deal with questions related to energy use and sustainability the following are to be highlighted: Journal of Sustainable Tourism, energy policy, Journal of Cleaner Production, ecological economics, energy economics, sustainability, and a long etcetera.

The WoS includes in its information data relative to the scientific descriptors of the subjects dealt with in each document gathered in this database, with a range of frequency which goes from zero to ten. In our case, we have found in the 213 documents selected a total of 1319 appearances of 644 unique descriptors, with an average appearance of twice

each. The descriptors with a greater number of appearances (more than 10) represent 17.7% of the total; among them, in descending order, are “CSR,” “management,” “performance,” “climate change,” “energy,” “impact,” “sustainability,” “industry,” “perspective,” “tourism,” “model,” and “strategy.” Four hundred fifty-one descriptors appear once (34.2% of the total) and the rest (178) are 48.1%. These descriptors are grouped into four large categories: “CSR,” “Economics and business,” “tourism,” and “sustainability and energy use.”

As to the signing authors of the publications analyzed, 546 sole authors produce a total of 608 signatures, which means that each article has been signed by on average almost three authors (actually, 2.85) and that each author participates on average in 2.5 articles (with a range which goes from 1 to 8). Figure 4 shows the distribution of the authors based on Bradford’s law: In the core of the most productive authors there are five people (0.9%) who contribute 4.4% of the production (27 signatures); the periphery (zone 2) is made up of 506 authors with a single article, 92.7% of authors, and 83.2% of signatures; finally, zone 1 or the intermediate group: Thirty-five researchers (6.2%) for 75 signatures (12.3%).

If we refer to the most prolific authors (greater number of works), as well as the most productive (they incorporate the weighting of their contribution to the work signed, calculated taking into account the number of authors of each article: Articles signed alone score 1, those signed by two authors add 0.5 points for each author, the articles with three authors add 1/3 point to each author, and so on; this way we obtain the so-called fractioned productivity), as is shown in Table 1, Susanne Becken is in first place, both in terms of the global volume of publications (8) and fractioned productivity (5.5). In terms of the volume of production, the previous researcher is followed by Stefan Gossling (7), Jeou-Shyan Horng (4),



**Figure 4.** Distribution of authors and signatures.

**Table 1.** Measures of productivity of the authors

| Author                   | Number signatures | Alone | Collaborations | Fractioned productivity |
|--------------------------|-------------------|-------|----------------|-------------------------|
| Becken, Susanne          | 8                 | 4     | 4              | 5.5                     |
| Gossling, Stefan         | 7                 | 2     | 5              | 3.6                     |
| Horng, Jeou-Shyan        | 4                 | 0     | 4              | 0.9                     |
| Hu, Meng-Lei Monica      | 4                 | 0     | 4              | 0.9                     |
| Teng, Chih-Ching (Chris) | 4                 | 0     | 4              | 0.9                     |
| Doukas, Haris            | 3                 | 0     | 3              | 0.83                    |
| Isik, Cem                | 3                 | 0     | 3              | 1.17                    |
| Peeters, Paul            | 3                 | 0     | 3              | 0.8                     |
| Raza, Syed Ali           | 3                 | 0     | 3              | 1                       |
| Simmons, David G         | 3                 | 0     | 3              | 1.17                    |



Chih-Ching (Chris) Teng (4), and Meng-Lei (Monica) Hu (4). On the other hand, based on the fractioned productivity, the results show that the most productive author, Susanne Becken, is followed by Stefan Gossling and different authors who, with more than two signatures, have fractioned productivity levels around 1: Two with values slightly above, one with a value of one and five with values below. To sum up, the two most productive and prolific authors are Becken (specialized in topics of energy use in tourist sector activities) and Gossling (centered on sustainable tourism).

## 5. Final considerations

This work has highlighted the paucity of research on energy use in the areas of tourism and/or CSR. At the same time, a first approximation has been carried out, with a bibliometric focus, to the most outstanding topics, sources, and authors on research concerning energy use in these two areas.

The results found underscore the great relevance in current studies of the bibliographic sources typical of the tourist discipline (“tourism management” and “Journal of Sustainable Tourism”) and the field of sustainability (energy policy and Journal of Cleaner Production), as well as the scant importance of specific sources of CSR.

The subjects or topics of highest interest among the researchers can be grouped into four large categories: “CSR,” “economics and business,” “tourism,” and “sustainability and energy use.”

Finally, the most relevant authors in this research topic have been identified: Susanne Becken and Stefan Gossling. The former is specialized in subjects of energy use in tourism, and the latter in matters of sustainable tourism.

Knowledge about the sources, topics and most outstanding authors in the subject of energy use in relation with CSR and tourism is useful for new researchers as it offers them a global view of the current situation, as well as the possibility of identifying possible future research lines.

As with all research work, ours has some limitations. First, it only deals with the contributions made in the field of economic and business research, leaving aside other relevant aspects. Second, the identification of topics and subjects is too generic and requires the carrying out of a study in greater depth in the future.

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