

Article

A Multicriteria Methodology to Evaluate Climate Neutrality Claims—A Case Study with Spanish Firms

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Abstract: Net-zero pledges have become a paradigm of ambitious climate change action for companies, governments, and other organisations. However, there is no international standard or criteria to assess whether those commitments are feasible or truly represent a landmark in low carbon performance. In this paper, a methodology is proposed against which those statements can be quantified and assessed. The methodology was applied to Spanish companies that report to the Carbon Disclosure Project and showed that the biggest areas for improvement are the design of action plans, calculation, and offsetting. From a sectoral perspective, the energy sector, finance, and other services stood out as those with the highest scores. The food, beverages and tobacco, industry, and the entertainment industry obtained the lowest results. From a technical standpoint, strategy and commitment, calculation and scope, and communication are the areas where companies had the highest average scores. On the contrary, offsetting and action plans are the areas with the greatest room for improvement. Still, actual commitments are not enough to meet international climate neutrality objectives in the long-term and companies should continue to work in this direction. An enabling regulatory framework would be very useful to align private and public action in this area.

Keywords: climate neutrality; net-zero; climate change mitigation; voluntary carbon market; climate change; environmental integrity



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1. Introduction

The Intergovernmental Panel on Climate Change (IPCC) states that net-zero is the balance of anthropogenic emissions of greenhouse gases (GHG) into the atmosphere with anthropogenic removals over a specific period [1]. Reaching this balance is a monumental challenge that has been defined as the leading global environmental goal of the 21st century [2] or even as a new industrial revolution [3]. International treaties, such as the Paris Agreement [4], and the latest scientific literature [5,6] both point towards the need for net-zero emissions by mid-century to limit global warming to 1.5 °C. Postponement or inaction will increase the difficulty of this task and close the door on an opportunity to prevent critical threats to economies and society [7,8].

Until recent years, corporate GHG emission targets have generally been incompatible with the 1.5 °C objective and thus, inconsistent with the path mentioned above [9]. Due to more strict legislation and growing public awareness regarding the necessity of net-zero, companies' promises to achieve net-zero are gaining momentum [10]. In this context, the EU and other countries have ambitiously increased regulations in recent years to decarbonise the private sector and boost energy transitions from fossil fuels to renewable energies [11]. To date, more than 1560 companies have pledged or committed to initiatives to net-zero targets, and together they represent revenue of over US \$12.5 trillion, equivalent to more than 50% of the U.S. GDP [12]. According to the literature, transitioning to low carbon can provide several benefits to companies [13].

Hence, these corporate pledges are essential to achieve global climate targets [14–16]. The combination of a clear methodology, technological innovations, financial support, and multisectoral collaboration could help to achieve carbon neutrality [14,17]. Nevertheless, net-zero pledges are a complex issue. Although it is true that net-zero targets currently cover two-thirds of the global economy, some authors consider that just 20% of them pass quality assurance [18]. Furthermore, inconsistency in the approach of the targets and data gaps make a proper assessment extremely complex [19]. Key areas of divergence have been identified in emission coverage as well as for the activities included, the timeline, and the general plan in approaching the target [10]. Other authors agree that there are discrepancies in the scope, timing, equity, future uncertainties, dependence on other actors, and governance [20]. Variation in terminology is another aspect where alignment is needed, as actors use a range of expressions to convey comparable concepts, including “net-zero”, “carbon-neutral”, and “climate-neutral”. These concepts are frequently used interchangeably due to a lack of standardised definitions and guidelines for use, leading to inaccurate climate pledges amongst actors based solely on nomenclature [12].

Existing neutrality frameworks are insufficient to ensure a company’s carbon neutrality as, on the one hand, they set some important evaluation criteria aside. On the other hand, they are mostly qualitative, providing a limited and subjective picture of the real efforts and performance of the organisation under review. No methodology has yet been devised to generate indices capable of aggregating information into a single figure and, therefore, to establish scores and rankings.

This paper aims to propose a methodology in order to evaluate climate neutrality claims and to apply it to some companies to test its applicability and limits, based on public information. The following section describes existing frameworks that can be used for this goal. Section 3 delves into the materials and methods of the proposed methodology. Section 4 provides the results obtained when applying this framework to several relevant Spanish companies. The paper closes with some discussion, concluding remarks and policy recommendations.

2. Existing Climate Neutrality Frameworks

The epitome of net-zero pledges comes with an unprecedented amount of information on the topic. In the corporate world, more and more companies are setting net-zero targets. However, it seems that each organisation sets its own criteria and terms for net-zero. This lack of standardisation and comparability leads to ineffective results [21].

Four existing frameworks to establish effective and standardised criteria in order to achieve net-zero have been selected to provide an overview of existing approaches and their limitations. They were developed by international initiatives and organisations recognised in the field of corporate sustainability.

The four frameworks are (a) the University of Oxford: ‘Taking Stock: a global assessment of net-zero targets’ [18]; (b) the University of Cambridge: ‘Targeting Net-Zero: a strategic framework for business action’ [8]; (c) Science Based Targets initiative (SBTi): ‘Foundations for science-based net-zero target setting in the corporate sector’ [10]; ‘Science-Based Targets initiative (SBTi): Corporate Net Zero Standard; and (d) ‘Climate Action 100+ Net-Zero Company Benchmark Framework’ (CA100+) [22].

Table 1 summarises the similarities and differences of these frameworks regarding the key criteria for net-zero pledges. These criteria refer to the timeframe in which climate neutrality is to be achieved (by 2050), whether the targets have been approved (target status), whether interim goals are consistent with achieving climate neutrality by 2050 (interim goals), whether transparency in strategy and annual reporting is required (published plan/strategy, annual reporting/transparency), and whether the use of carbon credits is allowed (use of offsets).

Table 1. Compilation of key criteria proposed by the selected frameworks.

	University of Oxford: 'Taking Stock: A Global Assessment of Net-Zero Targets Report Published'	University of Cambridge: 'Targeting Net-Zero: A Strategic Framework for Business Action'	SBTi: 'Foundations for Science-Based Net-Zero Target Setting in the Corporate Sector' and Corporate Net-Zero Standard	Climate Action 100+: 'Net-Zero Company Benchmark Framework'
Criteria	Timeframe (by 2050)	✓	✓	✓
	Target status	✓		
	Interim goals	✓		✓
	Published plan/strategy	✓		✓
	Annual reporting/transparency	✓		✓
	Use of offsets	✓	✓	✓

It is important to highlight some aspects that explain the above-mentioned differences. The framework presented by the University of Oxford differentiates itself as it considers not only companies, but also countries, cities, and regions. In contrast, the remaining three are exclusively for the corporate sector. Furthermore, the four frameworks do not share the same purpose. The University of Cambridge and SBTi frameworks provide guidance, while those from the University of Oxford and Climate Action 100+ can be characterised as verification frameworks. As a result, the former frameworks are intended for pre-net-zero target setting, whereas the latter can be used once the target is set to validate its quality.

Nevertheless, these frameworks have important limitations, as they are mostly qualitative and therefore can hardly be used to evaluate the relative performance of organisations or to rank them.

3. Materials and Methods

3.1. Methodology

As stated above, the goal of this paper is to provide a methodological framework that allows for an analysis and evaluation of corporate neutrality claims based on public information. Due to the heterogeneity and complexity of the aspects to consider, a multicriteria methodology was designed based on the following elements:

- Criteria: the main elements that must be considered when evaluating climate neutrality issues;
- Sub-criteria: specific aspects to be addressed within each criterion;
- Question: the issue against which scores are given. There is one question per sub-criteria.

A draft evaluation grid was prepared by the authors based on existing literature and their experience on the topic. A survey was then conducted in which 72 experts on climate change and climate neutrality participated, allowing the team to finetune the criteria, add additional sub-criteria, and provide scores to assign weights to the five criteria proposed.

The selected criteria, as shown in Table 2, include: (a) strategy and commitment; (b) calculation and scope; (c) action plan; (d) offsetting; and (e) communication. The validity and usefulness of the chosen criteria has been tested in the frameworks mentioned in Section 2. For instance, the SBTi has established guidance for companies on setting near-term and long-term targets, developing full GHG emissions inventories, mitigating emissions beyond value chains through offsets, and communicating and updating science-based targets [10,23]. Similarly, the CA100+ benchmark has developed a set of indicators

to assess the adequacy of corporate disclosure in terms of near-term and long-term GHG targets, capital allocation alignment and climate policy engagement alignment [22].

Table 2. Final methodological grid.

Criteria	Weight	Sub-criteria	Question
Strategy and commitment	0.22	Plausible with existing tools and resources	Is the neutrality claim feasible taking into account the tools, resources, and strategy deployed?
		Intermediate deadlines	Are there intermediate deadlines such as 50% neutrality by 2030?
		Responsibilities assigned	Has the company appropriately delegated responsibilities in terms of environmental sustainability and climate change within the organisation (who is responsible for what)?
		Considering climate risks	Has the company considered climate risks within its risk management and sustainability strategy?
Calculation and scope	0.20	Scopes considered	Has the company calculated its carbon footprint? Which scopes?
		GHGs included	What GHGs are considered when calculating the company's carbon footprint?
		Carbon removals	Does the company make use of CO ₂ removal projects (usually referring to the planting or conservation of forests and other carbon sinks) to absorb emissions from its value chain, as well as the use of Nature-based Solutions (NBS)?
		Footprint certified	Does the company certify the calculation of its carbon footprint by third parties (agents external to the company)?
Action plan	0.20	Action plan budgeted	Does the company have a carbon neutrality action plan and an investment budget to achieve net-zero?
		Cost-effectiveness analysis	Has the company performed a cost-effectiveness analysis?
		Balance between reduction and offsetting	Does the company strike a balance between offsetting emissions as a transitional tool and reducing emissions towards net-zero?
		Science based target	Has the company committed to science-based targets under the SBTi or in general, not necessarily to the SBTi net-zero standard?
Offsetting	0.18	Requirements for project types	Does the company have requirements on the types of projects with which it offsets its carbon footprint?
		Requirements for project standards	Has the company established requirements on the standards regarding offset projects?
		Cobenefit inclusion	Does the company include co-benefits as a requirement for the selection of offset projects?
Communication	0.20	Transparency over goals	Is the company transparent when communicating its neutrality objectives?
		Transparency over calculation	How transparent is the company with respect to the published communication regarding the calculation of its carbon footprint?
		Transparency over offsetting	How transparent is the company with respect to the information published on its emissions offsetting practices?
		Neutrality certified	Does the company certify its carbon neutrality through third parties and under initiatives such as Publicly Available Specification (PAS) 2060?

To determine the weight of the criteria, the median value for each criterion given by the survey respondents was divided by the sum of the median values.

$$W(C_n) = \frac{Med(C_n)}{\sum_{n=1}^5 Med(C_n)} \quad (1)$$

where:

$W(C_n)$ = Weight of criterion n

$Med(C_n)$ = Median score of criterion, $n = 1, \dots, 5$

$Med(C_n) = \frac{\sum_{i=1}^{72} SC_i}{72}$

SC_i = score given by expert i , $i = 1, \dots, 72$

All the sub-criteria (M) were assigned equal weights. The final list of criteria and sub-criteria included in the methodological grid is shown in Table 2.

Scores are given to each question and the values are then normalised on a 0–100 scale. The companies' final scores are the sum of the scores of all criteria, each of which is calculated the following way:

$$FS(C_n) = W(C_n) \cdot \left[\frac{\sum_{j=1}^m NS_j}{m} \right] \quad (2)$$

where:

$FS(C_n)$ = Final score for criterion n

M = number of sub-criteria for criterion n

NS_j = j normalised score

3.2. Case Study

This framework was tested against Spanish companies that report to the CDP. The CDP was chosen as it provides a comprehensive list of advanced companies that are already working towards reducing emissions to some extent. Therefore, of course, the sample is not representative of Spanish businesses as a whole.

The 95 companies that report to the CDP were grouped into 12 sectors as shown in Table 3.

Table 3. Sectoral groups in the case study.

Sector	Number of Companies	Activity
Energy	13	Energy production or management
Financial Services	14	Banks and insurance companies
Textile	3	Textile companies
Construction	11	Construction and infrastructure
Transport	10	Logistics, production of vehicles, and transport infrastructure
Technology	4	Technological and digital development
Real Estate	11	Real estate agencies and hotels
Healthcare	7	Pharmaceutical and cosmetics
Food, beverages and tobacco	2	Food processing and retail
Industry	8	Metallurgy, glass, and paper production
Entertainment	2	Amusement parks, gambling, and casinos
Other services	10	Communication, telecommunications, and security

The research has been carried out in the same way in all sectors. In other words, the companies have been evaluated regardless of the sector to which they belong. This introduces a certain bias, insofar as there are sectors in which, by the nature of their activities, it may be easier to move towards net-zero emissions.

Exhaustive research was conducted on these companies to ensure no publicly available data was left out. Among others, this included the information submitted to the CDP, as well as any publicly available climate information. Scores were given based on publicly available data and, as a result, a lack of published information from some companies may have influenced the final scores.

4. Results

4.1. Sectoral Results

As can be seen in Figure 1, the sector with the best performance regarding neutrality objectives and practices is the energy sector. This reflects the urgency of the transition from fossil fuels to renewable sources for this sector, as well as the impact of local and international regulation of climate change mitigation. Furthermore, the energy sector receives a high score in strategy and commitment but has a long way to go in translating its objectives into well-structured action plans in order to meet the objectives. This sector's lowest scores are for calculations (scope 3 of the carbon footprint) and offsetting. Due to the enormous challenge that climate change poses for the energy sector, it is essential to ensure that these commitments and actions are effectively implemented in practice and not just outlined in public documents.

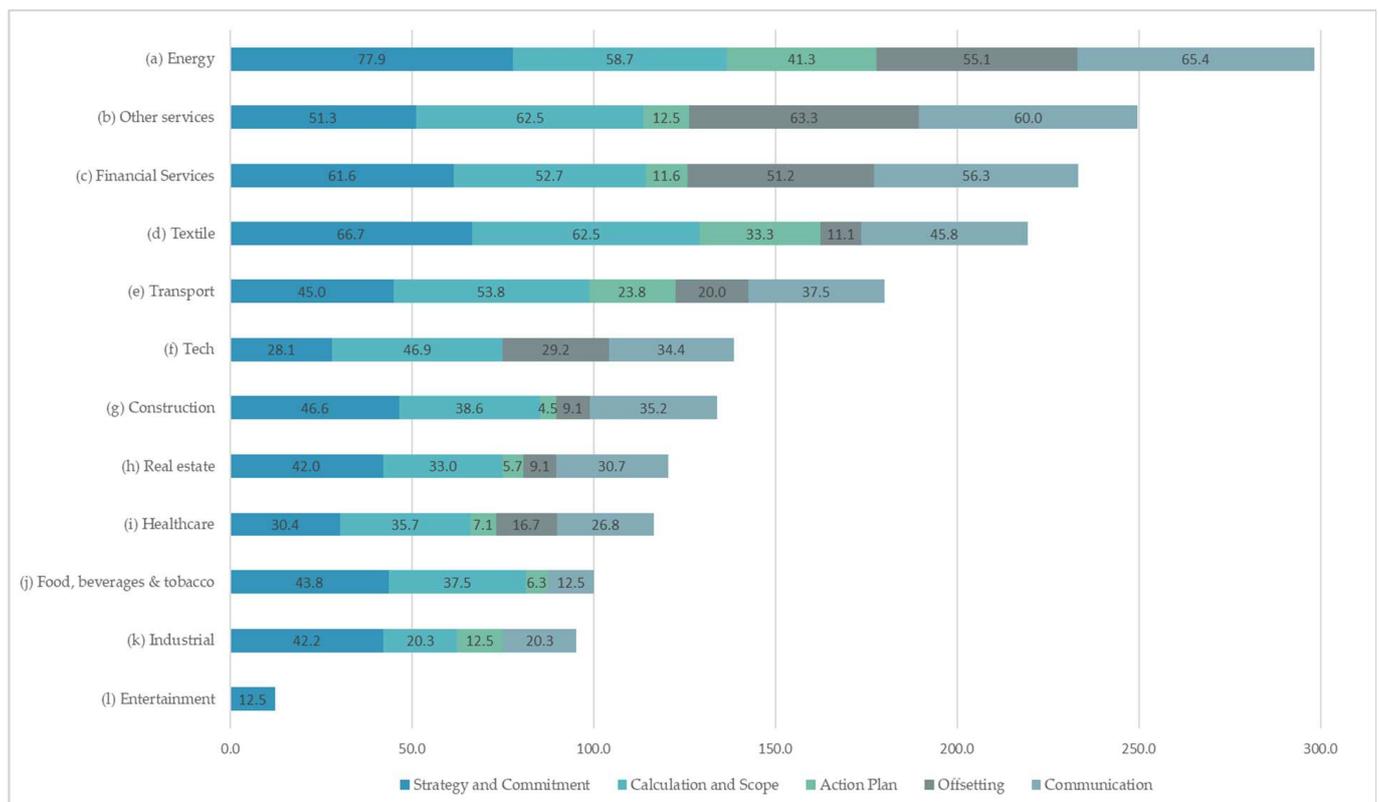


Figure 1. Average results obtained in each of the categories for the sectors: (a) energy; (b) other services; (c) financial services; (d) textile; (e) transport; (f) tech; (g) construction; (h) real estate; (i) healthcare; (j) food, beverages and tobacco sector; (k) industrial; (l) entertainment. 0 is the lowest score and 100 the highest. Source: own elaboration.

Following the energy sector, “other services”, mostly comprised of communications companies, also ranks high. This sector’s particularly high scores come from the transparency of its communication and the prioritisation of requirements and international standards regarding emissions offsetting. However, there is still an opportunity for the development of action plans and climate change mitigation practices to achieve the objectives. It is worth mentioning that the GSM Association, which represents most of the world’s telecommunications companies, has signed an agreement with the United Nations for the decarbonisation of the sector and has created a set of guidelines to be followed by sector companies worldwide [24].

The financial services sector performs well in terms of strategy and commitment towards neutrality. However, as with other services, there is a significant opportunity for the implementation of these commitments and the structuring of clear action plans, as well as an improvement in the calculations and scopes of emissions. The financial services sector will likely improve its scores as it applies the new neutrality roadmap developed by the UN that sets the target for 2050 (UNFCCC, 2021). As highlighted in the literature, the development of sustainable financial intermediation channels is crucial to achieving net-zero economies [25].

The textile sector shows high performance in strategy and commitment towards carbon neutrality. Nevertheless, when analysing the results of the study, the sector still has room for improvement in action plans to achieve its objectives in prioritising reduction practices over offsetting, and in setting requirements for offsetting projects.

The transport sector shows low performance in most of the criteria. In general, it shows a need for stronger commitments towards neutrality and greater transparency in the calculations of emissions and communications. Stronger action plans are also an area for improvement, along with setting requirements for offsetting projects, standards, and the benefits of said projects. It also seems that emissions offsetting is being prioritised over emissions reduction practices in many cases.

Likewise, the construction sector shows opportunities for improvement towards carbon neutrality. The sector lacks strong commitments and detailed information on the calculations of emissions and scopes. It shows low results in action plans to achieve carbon neutrality objectives, prioritisation of reduction over offsetting (used only as a transition tool), and requirements for offsetting projects, standards, and the benefits of these projects.

The tech sector shows high performance on emissions calculations and scopes, but also improvement opportunities in setting robust neutrality objectives for the middle and long-term, developing action plans to achieve said goals, prioritising reduction practices over offsetting, and setting requirements for offsetting projects, their benefits, and the standards to be used. During the study, the score given for the criteria action plan was zero (0), as no information about investment plans, cost-effectiveness analysis, or SBTi commitments was found.

Results for the real estate sector show that the areas with the greatest room for improvement are the criteria of action plan and offsetting. The sector shows slow development of strategies and action plans to achieve neutrality objectives, prioritises offsetting over emissions reduction practices, and lacks targets and indicators based on science, as well as clear requirements for offsetting projects and standards.

The healthcare sector has among the lowest scores of the study. Like real estate, healthcare’s low scores are for the criteria of action plan and offsetting, followed by communications transparency. For the healthcare sector to achieve local and international objectives and comply with regulations, it must improve by setting appropriate neutrality objectives, being more rigorous when calculating emissions, developing clear roadmaps to achieve neutrality objectives, prioritising reduction over offsetting, and making its advances towards net-zero public and traceable.

The industrial sector has one of the lowest scores in the study. Apart from the opportunities for improvement in the criteria of emissions calculations and scope (mostly scope 3), detailed action plans to achieve neutrality objectives, and transparency in communication, the lowest score for the sector was for offsetting, which was zero (0). The sector lacks basic requirements for offsetting practices, such as for the type of offset projects, the location of the project, and the vintage of credits or year in which the emission reduction or removal occurred, as well as for standards and extra benefits of these projects.

Similarly, the food, beverages and tobacco sector shows significant opportunities for improvement in all criteria and particularly in offsetting, for which it also scored zero (0), as no information regarding requirements on the type of the offset projects, location of the project, vintage of credits, offsetting standards or co-benefit inclusion was found. Thus, the sector lacks basic requirements for offsetting practices, such as those mentioned above. It is also important to note that the analysed companies mainly specialise in retail, leaving aside production. That said, this sector's scores will likely improve if agricultural companies are analysed, as many are now beginning to implement the Farm to Fork EU strategy roadmap to comply with national and European regulations [26].

The entertainment sector included the fewest companies, but also the lowest scores for all criteria due to lack of available information. The sector performs poorly in terms of strategy and commitment towards neutrality and emissions calculations and scored zero (0) in the criteria of action plan, offsetting, and communications transparency. This performance may be a result of a lack of urgency in the sector, as it is not as emission-intensive as sectors like energy or transport.

4.2. Global Results

From an aggregated perspective, Table 4 shows that the energy sector stands out as having the highest global score, closely followed by other services and financial services. At the bottom of the list, with less than 25 points, are real estate, healthcare, food, beverages and tobacco, industrial, and entertainment. As stated above, data gaps are very relevant in these sectors and results sometimes reflect a lack of information rather than a lack of specific action. An improvement in communication is highly recommended.

Table 4. Average sectorial results.

Sectors	Average of Total Weighted Score
Energy	60.18
Other services	49.64
Financial services	46.89
Textile	45.12
Transport	36.55
Tech	27.68
Construction	27.65
Real estate	24.82
Healthcare	23.63
Food, beverages and tobacco	20.97
Industrial	20
Entertainment	2.77
Total general	36.81

Figure 2 shows that, in relative terms, strategy and commitment, calculation and scope, and communication are the areas where companies have been working hardest, and therefore have higher average scores. On the contrary, offsetting and action plans have higher improvement margins due to a lack of available information and/or because the nature of the sector did not imply an urgency towards emissions neutrality before recent regulations. It is important to note that of the companies analysed in the study only 24.2% have a neutrality pledge and robust objectives towards 2030 or 2050 in alignment with international and national goals and regulations.

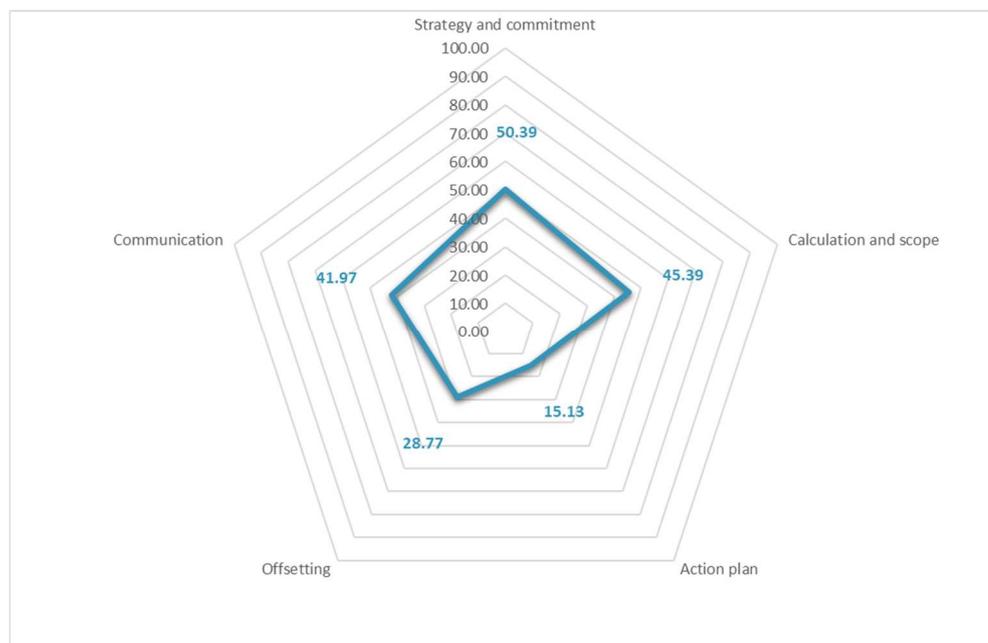


Figure 2. Average results per criteria. Source: own elaboration.

4.3. Correlation between Neutrality Claims and CDP Scores

The scores given through our methodology do not necessarily coincide with the results obtained by these companies in the CDP, as this initiative focuses on a variety of environmental and climate criteria that are not necessarily directly related to achieving net-zero in the medium-term. However, it is interesting to observe any consistencies between both scores, to analyse the coherence between general climate policy and neutrality claims.

To do so, the CDP scores were normalised and compared to the results of our study, aiming to identify alignment in terms of neutrality and potential gaps.

Results are shown in Figure 3. The correlation between both scores is 77%, which implies there is coherence between the climate performance of companies, as evaluated by the CDP, and their efforts towards climate neutrality, as evaluated by the authors.

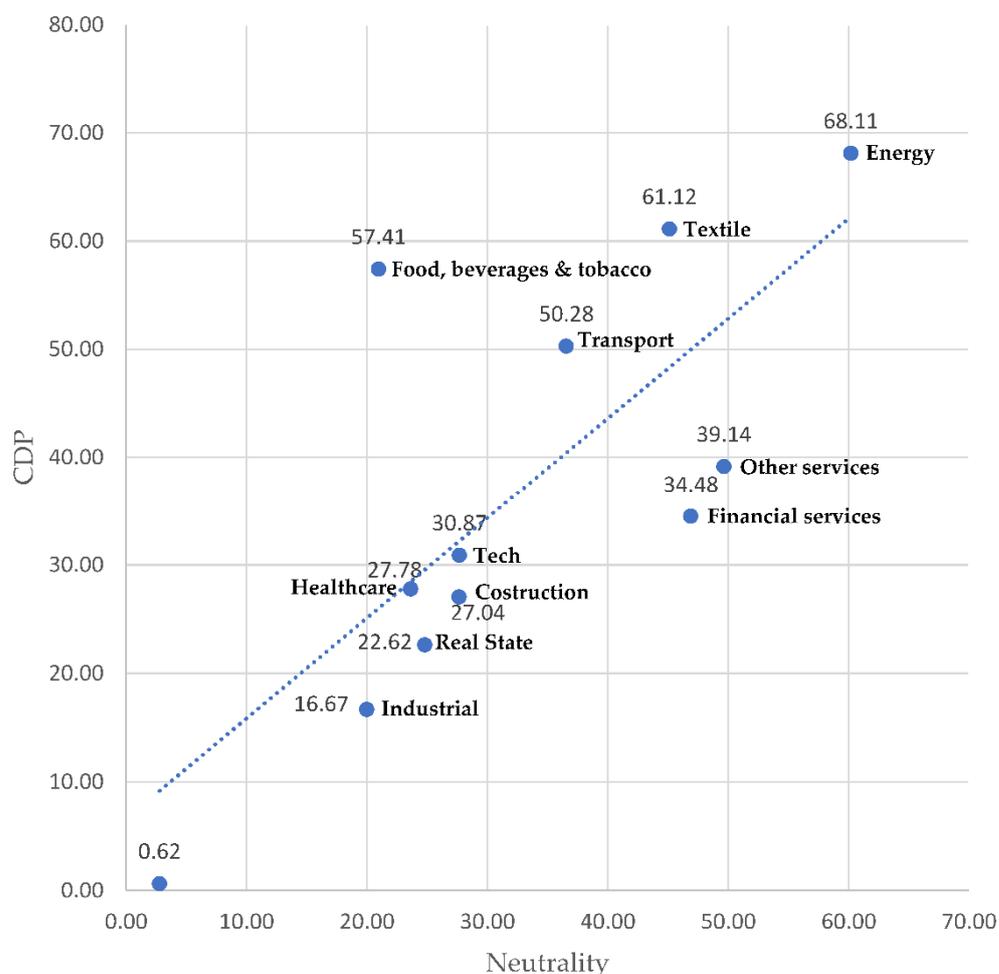


Figure 3. The correlation between normalised CDP scores and neutrality multicriteria methodology scores.

5. Discussion

The number of neutrality claims is increasing exponentially. However, some elements make stakeholders wary. On the one hand, many come from companies with high emissions and no realistic reduction plans. On the other hand, the voluntary markets will struggle to cope with the demand for offsets [27].

Meticulous systems need to be designed to assess the seriousness and rigor of these claims. The main challenge is that there is a mix of strategic elements, calculations, declarations of intent, investments, etc., which are difficult to evaluate in an aggregated way.

This paper has presented a multi-criteria system based on the assessment of five main elements (strategy and commitment, calculation and scope, action plan, offsetting, and communication). This framework provides a holistic evaluation of the main elements that differentiates serious claims from those that are mainly greenwashing based on an analysis of public information and corporate declarations. By applying the criteria against publicly available and specific data, the paper presents a case study which illustrates the benefits of assessing corporate climate neutrality claims quantitatively.

Nevertheless, this method has some limitations that are worth noting: (a) a lack of published information can make it complex to apply such a comprehensive system; (b) it can be difficult to assess statements without in-depth knowledge of the sector and the company; (c) there are always subjective biases, especially given how the objectives are stated by organisations may influence the evaluation; and (d) beyond what is expressed

in reports, it is necessary to verify the extent to which companies are implementing these commitments.

However, this system can be useful both for comparing: (a) sectors against each other; (b) sectors in different countries or regions; and (c) different organisations against themselves over time. However, as stated above, the sector to which an organisation belongs can have a substantial influence on its ability to move towards net-zero, which can make the comparison between different sectors somewhat unfair.

In any case, it must be acknowledged that corporate commitments are shaped by, and dependent on, public decisions made on a global scale, but also in the countries where these companies are located. Organisations based in countries with ambitious commitments and mitigation policies can be influenced towards more active climate action. Understanding how private and public interests align and correlate is an important issue to be considered when analysing companies in different geographical areas.

Additionally, the authors have identified several lines of further research in this field. On the one hand, it would be relevant to study the relation between stock market capitalisation and the emissions intensity of a company, aiming to prove that carbon neutrality makes an organisation more attractive to investors and thereby build a strong and growing stock market participation. It is also important to note that, for investors, climate change is an increasingly important concern. Ethical investors focus even more on companies working towards net-zero as a factor in investment selection, which may incite organisations to adopt appropriate strategies [28].

On the other hand, a next logical step would be comparing the same sectors between different countries within the European Union or countries that have the same level of development of climate strategies. Likewise, it may be strategic to compare companies within the same sector to identify progress and particular gaps in climate neutrality.

6. Conclusions and Policy Recommendations

The goal of this paper was to define a comprehensive method to evaluate climate neutrality claims. To do so, a multicriteria method was designed that includes the main criteria of strategy and commitment, calculation and scope, action plan, offsetting, and communication. The elements included in the methodology, as well as the weights, were obtained via a survey of numerous experts in the field.

This methodology was used to evaluate the performance of Spanish companies reporting to the CDP. In general terms, strategy, calculation and scope, and communication are the areas where companies have been working the hardest, while offsetting and action plans are areas with the greatest opportunities for improvement.

From a sectoral standpoint, the energy sector has the highest global score, followed by other services and financial services, understanding that the results are based on public information and corporate declarations, and that some of these companies may not be doing enough internally to meet the objectives set for 2030 or 2050. These sectors have developed roadmaps towards neutrality and their contribution to global GHG emissions makes it more urgent that they act. The sectors with the lowest scores are real estate, healthcare, food, beverages and tobacco, industrial and entertainment.

Only 24.2% of the companies analysed in the study have neutrality pledges, and robust objectives towards 2030 or 2050, in alignment with international and national goals and regulations. In conclusion, there is significant room for improvement regarding carbon neutrality among the analysed sectors. Organisations must boost their climate action to achieve international neutrality objectives.

Regarding implications for policy development, it is essential that a system is put in place to assess the credibility of companies' claims, so that stakeholders can evaluate and make informed financial and policy decisions. A quantitative approach that allows for the comparison of different companies and sectors is necessary to assess the relative performance of companies and its evolution over time.

A regulatory development that requires the public availability and disclosure of information concerning climate neutrality would be an important support to ensure a homogeneous framework and equal opportunities for different organisations. On the other hand, only a rigorous system can make it possible to differentiate between mere flashy statements and real action undertaken by companies.

Some limitations of the study refer to the geographical and sectoral scope of the companies covered, hence there is additional room for further research. The information reported by the CDP on companies provides a detailed and updated database to test and confirm the preliminary findings of this paper, and to finetune the scoring methodology. A higher number of assessed companies may also provide additional insights, for instance to what extent the quantitative scores obtained are influenced by factors such as company origin, capital structure, size, country of origin and GHG emissions intensity.

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