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Spanish securities issuers and their relationship with climate change

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Summary

- The main objective of this work is to carry out a first estimation on the amount of the greenhouse gas (hereinafter GHG)[1] emissions of Spanish issuers of securities. It also carries out an initial exercise on the degree of alignment of their emission reduction goals with the objectives set out in the Paris Agreement and in the European Union. In addition we assess the extent to which the challenges deriving from climate change have been incorporated into business management, particularly in the area of corporate governance, the risks and opportunities identified and specific emission reduction goals set.

- This document forms part of the work carried out to fulfil the mandate established in Law 7/2021, of May 20, on climate change and ecological transition (the "Climate Change Law"). Article 33 establishes that every two years the Bank of Spain, the CNMV and the General Directorate of Insurance must prepare a coordinated report within the AMCESFI[2] on the degree of alignment with the climate goals of the Paris Agreement and with the regulations of the European Union and an assessment of the risk to the financial system deriving from climate change.

- The information used in this study is diverse in nature. On the one hand, use has been made of the responses to a questionnaire sent by the CNMV to a group of Spanish issuers of securities (99) on climate change. In the future, this information can be obtained from the reporting obligations that entities will have and from a report that issuers of securities will have to send to the CNMV pursuant to article 32.1 of the Climate Change Law.[3] Use was also made in this article of the information provided by the Bloomberg and Refinitiv commercial databases. Finally, some of the estimates from the work carried out by Crisóstomo (2022) have been incorporated. This work describes the risks to security issuers posed by the transition.

- Analysis reveals that the available information is not complete, there being some securities issuers for which no relevant information is available. However, there has been an increase in the information available in recent years, as well as an improvement in its quality. In any case, if we aggregate the available data collected on emissions, we see that most of the emissions come from scope 3 (431 million), followed by scope 1 (90.4 million) and, to a lesser extent, by scope 2 (11.1 million). Between 2018 and 2021, a decrease in total emissions of all three scopes of 13.7% is observed, which responds, above all, to the decline in scope 1 and 2 emissions. It must be borne in mind that these figures may under-estimate the real emissions of each of the scopes, and also that they are based on incomplete data. In this regard it is important to point out how, with Directive (EU) 2022/2464 of the European Parliament and of the Council, of 14 December 2022, as regards corporate sustainability reporting, the EU legislator aims to improve the transparency, coverage and quality of data on European companies' emissions in the future.[4] Among the improvements it envisages is the inclusion by financial institutions of emissions linked to their lending and investment portfolios as scope 3 emissions.

1 See footnote on page 4.

2 AMCESFI is the Spanish acronym for Spain's Macroprudential Authority Financial Stability Council.

3 The content of this report will be specified by Royal Decree.

4 Companies subject to this Directive will have to report using European Sustainability Reporting Standards (ESRS). The European Commission is expected to adopt these standards in the first half of 2023. The standards adopted by the European Commission will be based on a proposal by the European Financial Reporting Advisory Group (EFRAG). EFRAG's proposal can be found at: https://finance.ec.europa.eu/system/files/2021-03/210308-report-efrag-sustainability-reporting-standard-setting_en.pdf

– The available forecasts of future reductions of GHG emissions by large companies show that they expect to continue significantly reducing their scope 1 and 2 emissions. For these scopes, the estimates obtained suggest that Spanish issuers would be aligned with the provisions of the Paris Agreement and European Union legislation. However, when scope 3 emissions forecasts are included, the reduction in GHG emissions would not be sufficient to meet these objectives.

– The questionnaire that the CNMV sent to 99 leading issuers, and to which response was voluntary, included questions on historical GHG emissions and future reduction targets, risks and opportunities deriving from climate change and the incorporation of the challenges of climate change into corporate governance. An indicative climate change index has been compiled from a set of responses to the questionnaire, which captures and synthesises the responses of issuers on the subject. This index, the maximum value of which for each company is 100, shows an average of 69.5. From this value we deduce that companies are reacting to the challenges posed by climate change, though it is noticeable that larger companies are in a somewhat more advanced phase. In any case, it must be borne in mind that this index has limitations: thus, the data reported have not been verified and it has not been possible to include all the information reported. In the future a more in-depth look must be taken at improving the information received so as to be able to have a more precise assessment.

– To complete the analysis in other aspects of interest, the results of the work by Crisóstomo (2022), which is focused on assessing the transition risk of investment funds. Based on the data used in this paper, the transition risk of each of the Spanish issuers of securities can in turn be assessed. In the work referred to, the author estimates the transition risk for investment funds registered with the CNMV by aggregating the individual expected losses of each of the securities making up the funds' portfolios. These securities come from Spanish issuers and issuers from 66 other jurisdictions. Based on the individual expected losses of the various equities, the distribution functions linked to the transition risks of both Spanish issuers and issuers from other jurisdictions which are part of the Spanish fund portfolios have been calculated. From the comparison of both distributions, it can be deduced that Spanish issuers are better prepared to face this risk. This is because they present a lower expected loss than issuers from other countries and also a lower dispersion.

– Lastly, this work dedicates an exclusive section to companies in the energy sector due to the significance of this sector in the volume of GHG emissions. It includes a summary table of the risks and opportunities identified by some organisations, as well as the measures that they have proposed to mitigate the former and profit from the latter. The oil and gas subsector is distinguished from the electricity subsector.

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Content

1 Introduction

The main objective of this work is to offer a first estimation of the GHG[1] emissions of Spanish issuers of securities and to determine, as far as possible, the degree of alignment of their emission reduction goals with the objectives set out in the Paris Agreement and in the European Union. An evaluation will also be made of the incorporation of the challenges deriving from climate change into business management, particularly in the field of corporate governance, in addition to the identification of risks and opportunities and the establishment of specific goals to reduce emissions. At the same time, this document contributes to fulfilling the mandate established in Law 7/2021, of 20 May, on climate change and ecological transition. Article 33 establishes that every two years the Bank of Spain, the CNMV and the General Directorate of Insurance must prepare a coordinated report within the AMCESFI on the degree of alignment with the climate goals of the Paris Agreement and with the regulations of the European Union.

This report will gradually be enriched as the future reporting obligations in the area of corporate reporting on sustainability detailed in section 2 come into force. For example, pursuant to Article 31.2 of Law 7/2021, issuers of securities will have to submit to the CNMV an annual report containing an assessment of the financial impact on them of the risks linked to climate change generated by the exposure of their activity. This report will also include the risks arising from the transition to a sustainable economy and the measures adopted to confront these risks.

There is a great scientific consensus on the need of a global reduction of greenhouse gases. If emissions are not significantly reduced in the coming decades, the social and economic impact of the foreseeable increase in natural disasters associated with global warming will be very high. This consensus led, in December 2015, to the Paris Agreement, which aimed to limit climate change through a global response and was signed by 192 countries plus the European Union (United Nations, 2015). The main objective of this agreement was to keep the global temperature rise below 2°C relative to pre-industrial times and, as far as possible, limit it to 1.5°C. This means that most governments have made very significant environmental commitments requiring substantial GHG reductions. The 1.5°C objective was subsequently endorsed in the global conferences on climate change in Glasgow and Egypt.

1 The gases considered greenhouse gases are: water vapour (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrogen oxide (NO_x), ozone (O_3) and chlorofluorocarbons (CFCs). According to the Bank of Spain (2022), in 2020, China was the main GHG emitter (32%), followed at a great distance by the United States (14%) and the European Union (7.7%). However, from a historical perspective, the United States had probably contributed 25% of the total emissions since 1850, the European Union 18% and China 14%.

In this context, concern about climate change and the need for an ecological transition have become fundamental pillars of European Union policy in recent years.[2] Thus, recently, the European Commission proposed that by 2050 there would be no net GHG emissions.[3] The policies forming the backbone of the ecological transition pose a challenge for our society, since they require a structural change in the growth model and will have implications for all sectors of activity.

The climate challenge entails a series of risks that are normally divided into transition risks and physical risks. Transition risks refer to the possible negative effects of the introduction of policies to reduce GHG emissions in companies, especially those whose production models are carbon-intensive. Companies in sectors such as mining or the extraction of fossil fuels could see their income decrease and their costs increase at the same time. As for physical risks, these have to do with the economic impact of natural disasters, which are expected to increase in both frequency and magnitude. These physical risks will be all the more significant if the objectives of the Paris Agreement are not achieved. In any case, these two types of risks are interrelated and counterposed. The mitigation or minimisation of the impact of one type of risk implies, by definition, an increase in the other, so it is necessary to find an optimal balance. Initially, a more aggressive GHG reduction policy would increase transition risks while reducing physical risks in the coming decades. In this regard, it should be noted that, currently, and despite the efforts made and commitments for the future by the different economic agents, the scientific consensus indicates that the objective of limiting the temperature increase to 2ºC by the end of this century will not be attained. To attain it, the volume of global GHG emissions would need to be reduced by 3.2% annually over the next 30 years.[4] In this same regard, in the last meeting on climate change held in Egypt it was also reminded that in order to limit the temperature increase to just 1.5ºC, GHGs would have to be reduced by 45% globally by 2030.[5]

Deriving from international agreements and membership of the European Union, Spain has assumed commitments of a significant magnitude in environmental matters. It must also be taken into account that this adaptation to a carbon-free economy may be beneficial for Spain in the future. The Iberian Peninsula is one of the areas that may be significantly affected by physical risks if the carbon footprint is not reduced. Given these forecasts and the commitments acquired, there was a need for Spain to develop and implement an ambitious strategy to mitigate and adapt to the risks deriving from climate change. The fundamental pillars of this strategy are determined in: the Climate Change and Energy Transition Law, the National Integrated Energy and Climate Plan 2021-2030, the National Climate

2 See the European Union strategy linked to climate change, which can be found at: https://ec.europa.eu/clima/eu-action/adaptation-climate-change/eu-adaptation-strategy_en. Within this strategy, Regulation (EU) 2021/1119, of 30 June 2021, establishing the framework for achieving climate neutrality and amending Regulations (EC) No. 401/2009 and (EU) 2018/1999, establishes as an intermediate objective for 2030 a reduction of GHG emissions in the whole of the European Union of 55% relative to 1990 levels.

3 See European Commission (2021).

4 According to the Nationally Determined Contributions of the COP 26 held in Glasgow in 2021, 151 countries, accounting for 90% of global GDP, have committed not just to achieving the target of keeping the temperature increase below 2ºC, but to striving to keep it below 1.5ºC. This would mean reaching net neutral GHG emissions by 2050. In order to reach such ambitious thresholds, the United States, the European Union, China and Japan, within an orderly transition, would have to make more decisive GHG reductions before 2030 than those currently announced (Nieto, 2022).

5 See https://unfccc.int/news/cop27-reaches-breakthrough-agreement-on-new-loss-and-damage-fund-for-vulnerable-countries

Change Adaptation Plan and the Just Transition Strategy.[6] This strategy is fully in line with that of the European Union and seeks the total decarbonisation of the economy by 2050. For this, an electricity system based entirely on renewable generation sources is proposed. With a medium-term objective, in 2030, it is expected that the minimum GHG reduction will be 23% compared to 1990 records, that energy from renewable sources will account for 42% of the energy consumed and that consumption of primary energy will decrease by 39.5%.[7]

GHG emissions in Spain, after reaching their maximum in 2008, have been falling on average by 3.0% per year, reaching a level in 2021 that was 0.5% lower than that registered in 1990. This decrease has been due, to a large extent, to the increase in electricity generation from renewable energy sources (Serrano-Puente, 2021). The change in the sectoral structure of the Spanish economy and the decrease in household emissions have also contributed significantly. Nonetheless, in 2021 the Spanish economy emitted GHGs equivalent to 288.6 million tons of CO_2.[8] According to the Bank of Spain (2022), these emissions accounted for around 7% of the EU total, placing Spain as the fifth biggest emitter (23rd in terms of emissions per capita). To reach the targets in 2030, on average, emissions would have to decrease by 2% per year. Although this rate is lower than that registered since 2008, it must be taken into account that the marginal reductions in these emissions are increasingly costly. This transition will imply a great effort for all economic agents.

The ecological transition is thus a challenge that concerns all sectors. However, this article focuses on the GHG emissions of Spanish issuers of securities. This set of companies brings together the majority of large Spanish companies from each of the productive sectors that make up the national economy. Although some of their emissions (mainly indirect emissions) take place abroad, ascertaining the trend allows us to establish a guide for assessing the extent to which attainment of the medium- (2030) and long-term (2050) objectives is on track. These are the companies that so far have devoted most resources to ascertaining their contribution to GHG emissions and determining their strategy for adapting to an economy in which less GHG can be emitted. In any case, it is important to point out that, even within large companies, there is a need move ahead to greater disclosure of data and future projections as regards their relationship with climate change.

The rest of the document is structured as follows: Section 2 describes the data obtained in order to ascertain the GHG emissions of Spanish securities issuers and their objectives for the future. Section 3 analyses these data on all Spanish issuers of securities. For its part, Section 4 discusses issuers' future strategy on climate change and other relevant considerations in this regard. Section 5 focuses on the energy sector, in view of its strategic importance when it comes to decarbonising the Spanish economy. Lastly, Section 6 presents the conclusions.

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6 See also: the Renewable Hydrogen Roadmap, the Spanish Circular Economy Strategy and the National Strategy for Green Infrastructure and Ecological Connectivity and Restoration.

7 A primary energy source is any form of energy available in nature before being converted or transformed. It consists of the energy contained in raw fuels, solar, wind, geothermal, and other forms of energy that constitute an input to the system. When this primary energy undergoes a process to transform it into another form of energy that is easier for the final consumer to consume, it is called secondary energy.

8 See Ministry for the Ecological Transition and the Demographic Challenge (2022).

2 Database on GHG emissions of Spanish securities issuers

The information used to carry out this work comes from the responses to a questionnaire sent by the CNMV to a group of Spanish securities issuers and from the Bloomberg and Refinitiv commercial databases.

There are obligations that will come into force in the coming years related to companies' reporting of information on climate change. It is very likely that the carbon footprint calculation will become mandatory once the European Sustainability Reporting Standards (ESRS) come into force by means of a delegated act of the European Commission.[9] However, at the time of preparing the report required by the Climate Change Law, only part of these obligations had entered into force.[10] For this reason, the CNMV decided to send a group of securities issuers a questionnaire, response to which was voluntary, with questions on governance as it relates to the challenges posed by climate change, strategy and risk management, and metrics and objectives for reducing emissions.[11] It was sent to 99 Spanish issuers[12] of both equities and fixed income securities, as an advance of the provisions of Article 32.1 of Law 7/2021, of 20 May, on climate change and ecological transition and its transitional provisions. Companies subject to this Law are those that meet the following requirements:

– That the average number of workers employed by group companies during the year exceeds 250.

– That either they are considered public interest entities in accordance with the auditing legislation, or during two consecutive financial years, at the closing date of each of them, they meet at least two of the following conditions:

  - That total consolidated assets exceed €20 million.

  - That net consolidated annual turnover exceeds €40 million.

9 The standards adopted by the European Commission will be based on a proposal on these standards by EFRAG. EFRAG's proposal can be found at: https://finance.ec.europa.eu/system/files/2021-03/210308-report-efrag-sustainability-reporting-standard-setting_en.pdf

10 See Law 11/2018, of 28 December, amending the Commercial Code, the recast text of the Corporate Enterprises Act approved by Royal Legislative Decree 1/2010, of 2 July, and Law 22/2015, of 20 July, on the Auditing of Accounts as regards non-financial information and diversity. See Directive (EU) 2022/2464 of the European Parliament and of the Council, of 14 December 2022, amending Regulation (EU) No. 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting.

11 The model of the questionnaire can be found in Annex III.

12 The detailed list of issuers can be found in Annex II. Responses were received from 41.4% of the issuers. The sales of the responding issuers account for almost 70% of the total sales of all of them in 2021.

The questionnaire contains a series of closed questions with multiple-choice closed responses, which makes for a certain comparability among companies and which has served to develop a climate change index that allows an initial assessment of the situation of the issuers in relation to the challenges posed by climate change.

The Bloomberg and Refinitiv commercial databases helped complete the information on GHG emissions of Spanish issuers.[13] Drawn from the non-financial information documents of the various issuers, these databases offer information on GHG emissions, and other types of environmental, social and governance (ESG) information. At this point it is appropriate to recall that the GHG emissions generated by a company are divided into three types: scope 1, scope 2 and scope 3. Scope 1 emissions refer to those that come from sources that are owned or controlled by the company. Scope 2 emissions are indirect emissions from the generation of electricity, steam, heating and cooling purchased and consumed by the reporting company. Finally, scope 3 emissions include all other indirect emissions that occur in a company's value chain. Not all issuers publish this type of information and those that do sometimes do so incompletely.

Table 1 shows emissions for each of the scopes obtained from the questionnaire as percentages of the total obtained from the questionnaire itself and from information providers Bloomberg and Refinitiv:

Percentage of emissions obtained from the questionnaire TABLE 1

	Scope 1 emissions	Scope 2 emissions	Scope 3 emissions
2018	11.0	45.4	7.1
2019	10.2	46.8	7.5
2020	14.1	45.2	10.8
2021	16.1	50.3	10.1

Source: CNMV.

As can be seen in Table 1, the GHG report produced through the voluntary questionnaire sent to issuers by the CNMV provides very limited coverage. Only in scope 2 does the questionnaire provide coverage of GHGs close to half the total.

Table 2 shows the number of issuers for which there are emission data for each scope from 2018 to 2021 after adding the information from Bloomberg and Refinitiv:

13 In the following document we can see how Refinitiv reports scopes 1, 2 and 3 for each of the companies on which it provides information: https://www.refinitiv.com/content/dam/marketing/en_us/documents/fact-sheets/esg-carbon-data-estimate-models-fact-sheet.pdf. As for Bloomberg, it also offers this type of information, although in order to be able to access it one has to be a customer of this company. This documentation can be accessed through the following link: https://www.bloomberg.com/professional/blog/bloombergs-greenhouse-gas-emissions-estimates-model-a-summary-of-challenges-and-modeling-solutions/

Number of issuers of securities with GHG reporting TABLE 2

	Scope 1 emissions	Scope 2 emissions	Scope 3 emissions
2018	52	54	41
2019	62	63	48
2020	64	64	48
2021	64	64	49

Source: CNMV, Bloomberg and Refinitiv.

As can be seen in Table 2, the number of issuers that quantify and report their GHG emissions has been growing in recent years for all scopes. Another aspect that should be highlighted is the greater coverage of scope 1 and 2 emissions compared to scope 3 emissions. The number of companies publishing their GHG emissions for scopes 1 and 2 in all years of the 2018-2021 period was 52. For scope 3 the number was just 40.[14] The results indicate that the companies that report their GHG emissions tend to be large. This helps ensure that the data obtained are satisfactorily representative, since they capture the large companies from the most polluting sectors (for example, the energy sector). The fact that data are not available on all the issuers considered implies that the figures reported on emissions and their trends over time are lower than those actually produced.

The commercial databases used, which in many cases include estimates, also offer relevant information on how the challenge of decarbonisation is affecting companies. Both information providers offer future decarbonisation objectives for a series of issuers. Specifically, data are available for a total of 34 issuers for scopes 1 and 2. These issuers account for 78% of the emissions declared in scopes 1 and 2 in 2021. This figure falls to 18 when it comes to objectives for scope 3. These 18 issuers accounted for 15% of scope 3 emissions in that same year. Bloomberg also provides information on the alignment of these GHG emission reduction targets with the Paris Agreement for 34 of the issuers of securities considered.

In addition to information on emissions and their alignment with the Paris Agreement, commercial databases offer ESG ratings. Within those offered by Refinitiv, it is interesting to compare two of these ratings: one based solely on information provided by the company itself and the other that also takes into account news that may call into question some of the aspects published by the company relating to its ESG policy. The comparison between the two indices can be the starting point to identify the possible public perception of greenwashing. The number of issuers for which these data exist is 65.

Finally, with the aim of offering an assessment of the transition risks of Spanish issuers of securities, data from Crisóstomo (2022) have been used. In this paper, the author attempts to measure the transition risk for investment funds registered with the CNMV in a scenario of disorderly transition. To carry out this work, expected losses are estimated for one of the components of the portfolios. Based on these estimates, an initial quantificantion exercise on the transition risk of Spanish issuers can be carried out and related to the risk of a group of companies that includes issuers from 66 countries.

14 This number is due to the fact that there are issuers that published their scope 3 emissions for certain years and then stopped doing so for subsequent years.

3 Analysis of data on GHG emissions of Spanish securities issuers

According to the data collected through the different sources of information, in 2021 the GHG emissions of the issuers of securities considered that offered data were the equivalent of 532.9 million tons of CO_2. This estimate is the result of aggregating the data existing by issuer and by scope. Compared with the total emissions registered in Spain, those of issuers of securities were almost double. Of this total, 90.4 million tons corresponded to scope 1 emissions; 11.1 million to scope 2, and 431.4 million to scope 3.[15] Therefore, we see from the data that a large proportion of the emissions of the Spanish companies in the sample come from other companies which, in turn, are usually chosen to constitute their value chains.

Although it is pertinent to include scope 3 emissions in order to reflect an organisation's exposure to the risks and opportunities deriving from climate change, the measurement of these emissions is currently subject to several limitations. On the one hand, for a number of the issuers of securities included in the study insufficient data are available, which in some cases can be explained by issuers' difficulty in obtaining relevant, detailed information with which to quantify scope 3 emissions. There are also methodological questions such as double counting when emissions counted as scope 3 have already been reported by a supplier as scope 1. Added to this is the need to define clear boundaries in a company's value chain to avoid complicating the measurement of these emissions. These problems can affect the comparability, coverage, transparency and reliability of scope 3 emissions. On the positive side, it should be noted that there are increasingly advanced methodologies available that help with their calculation and substantial improvement is expected in this area.[16]

Figure 1 shows the trends in CO_2 emissions of these companies in recent years. To prepare this figure, the companies that made their emissions public in all the years of the 2018-2021 period were taken into account. It can be seen that total scope 1 emissions decreased by 35.8% and those of scope 2 by 25.4% For their part, scope 3 emissions have also decreased, albeit more moderately, by 6.6%. This notable decrease in scope 1, scope 2 and, to a lesser extent, scope 3 emissions could be a reflection of the effort made by companies to reduce the emissions that they can influence directly. At the same time, the effort seems to be less as regards emissions from the activities of third-party companies.

15 The lower scope 2 emissions are partly explained by the fact that a significant number of issuers contract with their energy suppliers that 100% of the energy they receive must come from renewable sources. In addition, these issuers often use the market-based approach to calculate their scope 2 emissions, which allows them to report small emissions.

16 See TCFD (2021). *Guidance on Metrics, Targets, and Transition Plans.*

GHG emissions of Spanish issuers FIGURE 1

Source: Issuers, Bloomberg and Refinitiv.

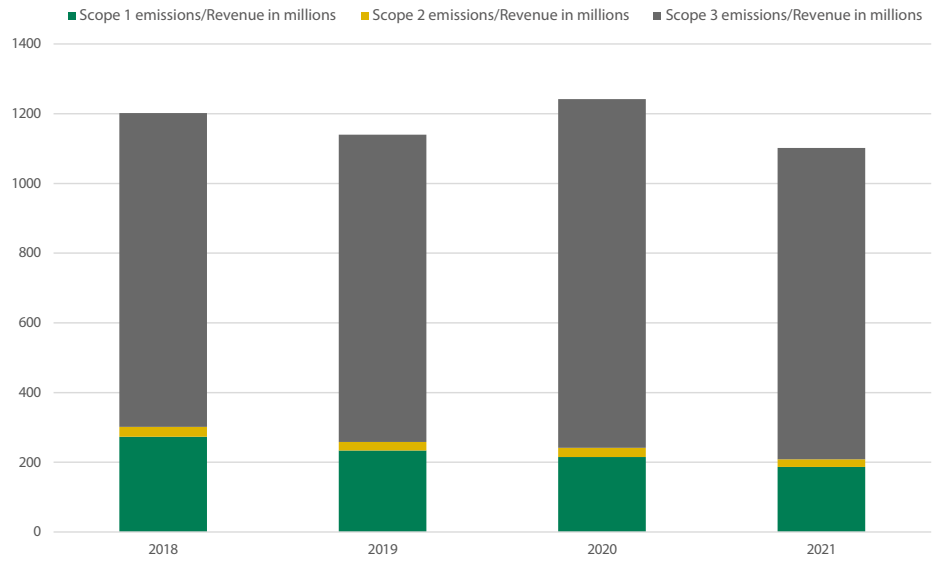
However, the emissions registered in 2021 increased moderately (0.3%) compared to those of 2020. This is due to the loss of activity of Spanish securities issuers in 2020 as it was the year with the greatest restrictions as a result of the COVID-19 pandemic. Within this slight increase, it should be noted that scope 1 and 2 emissions decreased and only scope 3 emissions were higher.

In addition to considering changes in GHG emissions in absolute terms, it is important to take into account other aspects, especially those relating to companies' levels of activity and production. One of the most commonly used metrics for this purpose is that of a company's GHG emissions (in kilograms of CO_2) divided by the company's revenues (in millions of euros) (Standard and Poor's, 2020). One of the advantages of this metric is that it can be applied to all issuers considered, regardless of the sector in which they operate.[17]

Using data from the same issuers as those in Figure 1, Figure 2 shows how the GHG emission intensity of Spanish securities issuers has changed. Emission intensity also fell during the 2018-2021 period, by 8.3%. The trend was interrupted in 2020 due to the COVID-19 pandemic. That year, gross emissions fell, but not their intensity. This is probably because despite the significant decrease in economic activity in the spring, certain systems had to be maintained and this required them to keep working and to keep emitting GHG. This situation probably prevented certain economies of scale of which advantage might otherwise have been taken. As for emission intensity by scope, due to the very construction of the index, this is proportional to that of the gross emissions.

17 There are other measures of GHG emission intensity that are usually applied to specific sectors, such as energy, which are very intensive in the use of inputs and create a large carbon footprint. An example of one of these ratios would be GHG emissions divided by kilowatt hours (kWh). However, these metrics are not easy to extend to other sectors.

GHG emissions of Spanish issuers (intensity) FIGURE 2



Source: Issuers, Bloomberg and Refinitiv.

One interesting aspect of the subject companies' GHG emissions is their distribution by business sector. The 99 securities issuers were first divided into five sectors: financial, energy, construction and real estate, industrial, and consumer goods and services. Table 3 shows the GHG emissions for each of the sectors and scopes in 2021. It shows that the energy sector is that which produces the most emissions, 80.8% of the total,[18] followed at a great distance by the industrial sector, with 9.2%. The sectors contributing least are finance and construction and real estate. In the majority of sectors, most GHG emissions come from scope 3.[19]

GHG emissions by business sector in 2021[1] TABLE 3

Millions of tons of CO_2

	Scope 1	Scope 2	Scope 3	Total
Financial sector	0.1	0.1	0.1	0.3
Energy sector	56.6	4.2	369.9	430.7
Construction and real estate sector	8.1	1.0	11.6	20.7
Industrial sector	13.8	4.4	31.1	49.3
Consumer goods and services sector	11.8	1.4	18.7	31.9
Total	**90.4**	**11.1**	**431.4**	**532.9**

Source: CNMV, Bloomberg and Refinitiv.

1 Aggregate emissions are calculated from companies that provide data on their carbon footprint.

18 This report contains a section dedicated to the energy sector which looks in greater depth at the evolution of its emissions and its future plans to move towards a decarbonised society.

19 According to TCFD (2021b), companies in the financial sector should include in their scope 3 GHG emissions those associated with the investments of financial institutions, which should match those of scopes 1 and 2 of their borrowers However, the standards for how to account for this have not been drawn up and, for the moment, its reporting is voluntary.

The figures in Annex I show the evolution of emissions for each sector between 2018 and 2021. To carry out the calculations, only those issuers that offer data on their carbon footprint for all the years of the period analysed have been taken into account. We deduce from these data that the patterns that came from Table 3 for 2021 are repeated over time in terms of the distribution of emissions among sectors and scopes. Thus, the largest emissions are produced by companies in the energy sector, followed at a great distance by those in the industrial sector. Although there are some differences among sectors, scope 3 emissions are the majority in most cases, followed by scope 1. Scope 2 emissions are, in general, the least voluminous, except in the financial sector, where they accounted for the majority of total emissions.[20]

Trends over time in emissions between 2018 and 2021 declined in all sectors except industrial, which presented an increase of 6.6%. In the case of the energy sector, the decrease was 13.6%. For the financial and consumer goods and services sectors, with the above-mentioned caveats on scope 3 emissions, the declines were greater, at 60.4% and 36.4% respectively. So in most sectors a significant effort was observed to eliminate part of their emissions. These efforts were largely focused on reducing scope 1 and 2 emissions since these depend on assets directly controlled by companies themselves, although in some cases these were also accompanied by significant declines in scope 3 emissions. Apart from 2020, which was marked by COVID-19, these decreases occurred in all years, except, again, in the industrial and construction and real estate sectors. These sectors increased their emissions in the 2019-2021 period, by 4.7% and 12.2% respectively. In this case, both sectors include companies whose reported emissions increased notably as the years went by, despite the fact that their revenues did not increase at the same rate. The most plausible explanation of this growth is that several companies were progressively adopting more appropriate standards and methodologies that would allow them to give greater coverage in measuring the carbon footprint of their activities. In other words improved measurement could explain at least part of the upward trend.

In the same way as for aggregate emissions, an analysis was carried out by sector of emission intensity, using the ratio of a company's GHG emissions (in kilograms of CO_2) divided by its revenues (in millions of euros). Annex I presents this ratio for each of the sectors in the 2018-2021 period, calculated for the set of companies that provided emissions data for all years of that period.

The energy sector is that with the highest ratio. It is followed at a considerable distance by the industrial and consumer goods and services sectors. The financial sector appears as the sector with the lowest emission intensity, as its bulk would come from the scope 3 linked to its investment and loan portfolios.[21] These results are in line with expectations and with those observed in other countries (OECD, 2022).

From the information presented, it can be deduced that the variation in intensity between 2018 and 2021 was uneven among sectors. The financial, consumer goods and services, and energy sectors saw their intensity decrease in that period, specifically by 48.1%, 9.6% and 15.0%, respectively. It is worth noting the decrease

20 In the next few years financial institutions will have to start reporting emissions linked to their lending and investment portfolios as scope 3 emissions. It is estimated that these emissions will be 700 times those currently reported by financial institutions. See CDP (2021).

21 See CDP (2021).

produced in the energy sector, as it has a greater weight globally both from the point of view of gross emissions and intensity. For their part, the construction and real estate and industrial sectors saw their intensities increase by 5.5% and 4.2%. As with the increases in absolute terms, these increases could be due, at least in part, to methodological improvements in the measurement of GHG emissions in these sectors that have contributed to increasing their coverage and precision. It is also important to point out the rise in intensities in 2020, especially for the consumer goods and services, and energy sectors. Due to the COVID-19 pandemic and the consequent recession, the decline in companies' revenues was greater than that in their emissions. This could reveal that when activity declines, companies in oligopolistic sectors such as energy take less advantage of economies of scale and scope.

4 Forecasts and other considerations on the relationship of Spanish security issuers with climate change

The fight against climate change will require a great effort on the part of all economic agents, including companies, especially those in the sectors that emit the greatest volumes of GHG. For this reason, in order to achieve the objectives established in the Paris Agreement and expanded in the European Union regulations, it is important to know how large companies are going to face this challenge in the future.

For many of these issuers, one indicator of this great challenge is its medium and long-term objectives for reducing GHG emissions. According to Bloomberg data, of the 99 issuers considered, 84 state that they have plans to reduce GHGs, six do not have plans, and it is not known whether the remaining nine have plans or not. Therefore, there is a certain lack of information on how issuers intend to face a future in which the reduction of GHG emissions will be one of their key challenges.

In addition to the limitations relating to the available data sample, there are others deriving from the diverse ways in which large companies express their GHG reduction objectives. They usually set a target for a specific year, for example 2050, as a percentage of the emissions of a specific year that is determined as the base year, for example, 2018. There is a great variety when determining the base year and different years are also considered for achieving the reduction objectives, although, in the latter case, most companies use the years 2030, 2035, 2040 or 2050. This lack of standardisation, especially in base years, makes comparison and aggregation between the different objectives published by companies difficult. Finally, it should be noted that, although most of the emission reduction targets are expressed in terms of relative carbon intensities, the real significance lies in committing in the future to publishing gross emissions.

Bloomberg offers an interesting treatment of the published data in its database, as well as two measures of interest for this study: the first consists of the number of companies that consider decarbonisation as a key business strategy. In this regard, it is found that there are data for 81 issuers. Of these, 16 have a strategy of complete decarbonisation and zero emissions. The second translates the objectives of each of the companies into contributions to global warming. The interesting thing about the information provided is that it is represented in degrees Celsius relative to the current situation, which makes it easier to interpret whether the objectives of that company are compatible with the Paris Agreement and the objectives of the European Union. This information is based on a public methodology applied by the Science Based Targets Initiative (SBTi).[22]

22 SBTi is the result of a partnership between the Carbon Disclosure Project (CDP), the United Nations Global Compact, the World Resources Institute (WRI) and the World Wide Fund for Nature (WWF).

These data are disaggregated for each of the companies in two dimensions: the first, in a time dimension, since it offers a short, medium and long-term perspective. The short term considers a horizon of five years from the last year in which the company published information on its plans to reduce GHG emissions. The medium term is a horizon of five to 15 years and the long term is more than 15 years. The second is a disaggregation dimension that offers some data considering only scopes 1 and 2 and others in which scope 3 is also considered. Table 4 shows the forecasts for the increase in average temperature that would be caused by the issuers for which there are data weighted by sales.

Temperature rise based on forecasts of securities issuers[1] TABLE 4

Degrees Celsius (°C)

Scopes 1 and 2			Scopes 1, 2 and 3		
Short term[2]	Medium term[3]	Long term[4]	Short term[2]	Medium term[3]	Long term[4]
1.33	1.47	1.47	1.93	2.08	1.84

Source: Bloomberg and own compilation by the authors.

1 The temperature increases shown come from the aggregation of the individual data of the issuers weighted by their sales.

2 Short term refers to a horizon of five years.

3 Medium term refers to a horizon between five and 15 years.

4 Long-term refers to a horizon of more than 15 years.

As can be seen in the results of Table 4, the efforts that the different issuers plan to make point to a significant reduction in GHG when it comes to scope 1 and 2 emissions. When scope 3 provisions are incorporated, the impact of the reduction is less. Therefore, it seems that issuers are focusing on reducing the carbon footprint that they produce directly and beginning to consider how to reduce that which comes from third parties. This table also shows that the objectives of issuers that make their future plans public are aligned in terms of scopes 1 and 2 with the Paris Agreement and the legislation of the European Union. On the other hand, when scope 3 is included in the forecasts, the strategies of these issuers would contribute to raising the temperature by around 2°C. This increase in temperature would be far from the objective of the policies of the European Union (1.5°C) and close to the upper limit (2.0°C) of the Paris Agreement.

The results of the table are better understood taking into account two points. The first is that a significant number of these issuers, which are domiciled in the European Union, have overseas suppliers. This makes it more likely that issuers will have to comply with European regulations for scope 1 and 2 emissions, since they are controlled by them and carried out within the European Union. On the other hand, for a significant segment of these large companies, scope 3 emissions could occur in countries that are outside the European Union and, therefore, outside its jurisdiction and regulations. The second point is that the table is based only on the issuers for which information is received, in this case, on their GHG emission reduction strategy. Consequently, Table 4 should be considered as an initial approach.

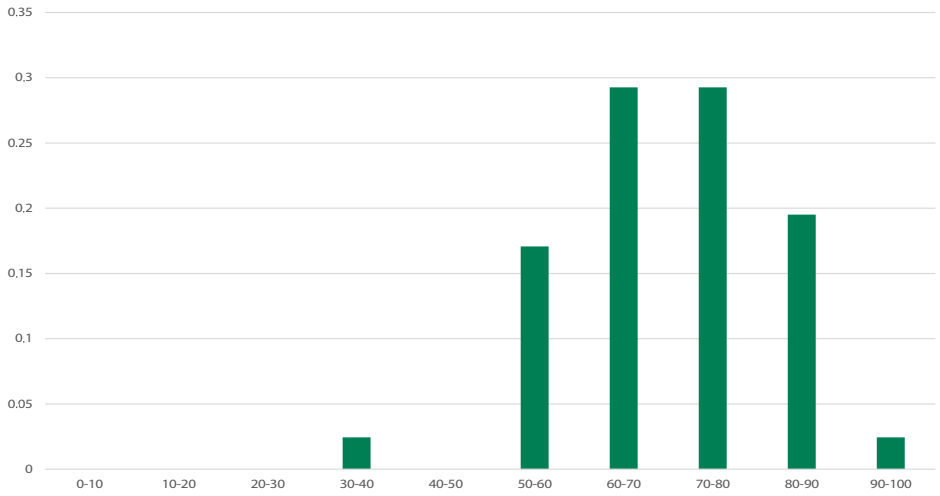
4.1 Other considerations on the relationship of Spanish securities issuers with climate change

Based on the information provided in the questionnaire sent to issuers of both equities and fixed income securities, we have constructed an index that evaluates issuers' governance, strategy and objectives for the fight against climate change. Nonetheless, we should point out that there has been no attempt to analyse or study the quality of the data provided, so they must be treated with caution. This questionnaire is divided into three parts. The first part is dedicated to governance in matters of climate change and contains 10 questions. The second part deals with issues related to the strategy and management of risks derived from climate change and consists of 15 questions. The last part is dedicated to the metrics and objectives related to climate change and contains five questions.

The proposed index seeks to measure issuers' response to the challenges posed by climate change. The index is based on the responses received to a series of questions, particularly those that can only be answered by a closed set of responses, each of which has been assigned a value. This value is higher when it can be deduced from the response that the issuer is incorporating the appropriate steps to face the challenge of climate change into its processes and decisions. Annex IV shows how the index is calculated for each of the issuers that have responded validly to the questionnaire. It is important to note that the value 100 is the maximum value that an issuer can obtain and that it would be assigned only if an issuer had answered all the questions with the option that gives the highest score.

Figure 3 presents the histogram with the index values obtained for each of the issuers in 2021. The mean obtained for the index was 69.5 and its standard deviation was 11.3. The average of the index weighted by the revenues obtained by each issuer increases to 76.6. This result indicates that larger issuers are more advanced in terms of climate change. Compared with the others, most of these large companies made more progress in decision-making both to identify the risks and opportunities that climate change entails and to carry out initiatives to reduce their GHG emissions. In any case, from the answers that the issuers themselves sent, it can be deduced that the general level of perception of the risks derived from climate change and of their inclusion in companies' strategies is noticeable. The figure also shows that the score distribution is fairly symmetrical. Most companies achieve an index value between 60 and 80, while a notable number of them score above 80. On the other hand there are a few companies whose index is less than 60. These latter issuers are mostly relatively small.

Histogram of the climate change index (questionnaire to issuers) FIGURE 3

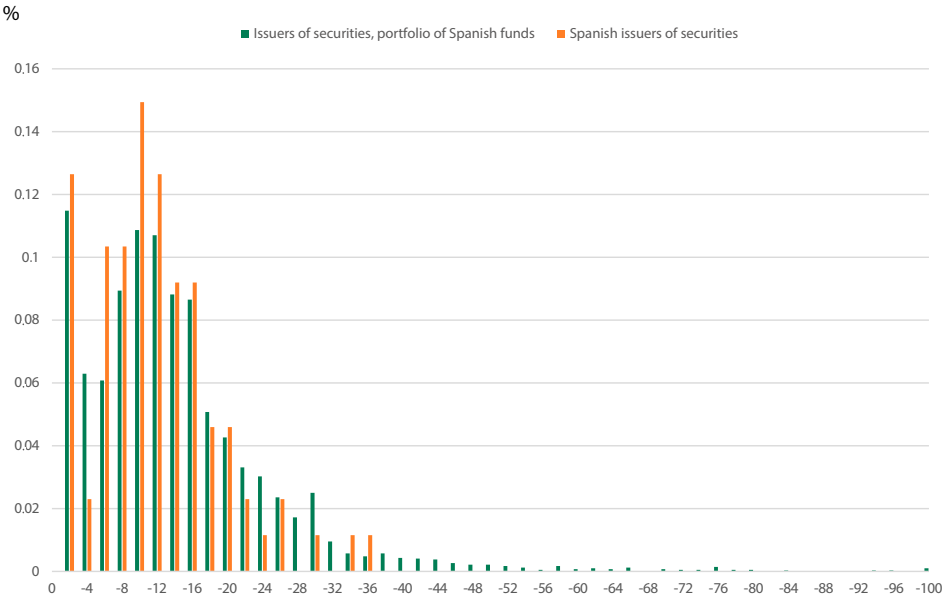


Source: Issuers and CNMV.

Among the works that the CNMV has prepared to contribute within the AMCESFI to the mandate emanating from Article 33 of Law 7/2021, of 20 May, on climate change and ecological transition, Crisóstomo (2022) seeks to measure the transition risks of investment funds registered with the CNMV. The methodology applied in this article is common to the banking and insurance sector and is based on the EIOPA article (2022). In this exercise, the expected loss of each of the investment fund portfolios is estimated in a scenario called 'messy transition', in which in 2030 no issuer of securities has made the necessary adaptation to be in line with the Paris Agreement and the regulations of the European Union. This expected loss would be calculated as an aggregation of the effort that each issuer would have to make and that would be reflected in its assets, starting in 2030 with a five-year horizon, to make the transition and adapt the company to climate change objectives.

The exercise calculates the expected loss for the different types of assets that make up the investment portfolio of the funds. However, in order to compare the transition risks of Spanish issuers, the expected losses of the equity instruments held by the investment funds will be used. This set is made up of a total of 4,196 shares of issuers in 67 jurisdictions. Crisóstomo (2022) calculates the expected loss due to transition risk for 87 of the 99 Spanish issuers considered. Figure 4 shows that the distribution of losses of Spanish issuers presents a greater probability of obtaining negative returns of lesser magnitude than the distribution of issuers from other jurisdictions. This fact is reflected in the expected average losses of Spanish issuers and those of the group in which Spanish funds invest: that of the former is 10.8% and that of the latter is 13.2%. Spanish issuers also show less dispersion in expected losses, 7.2% compared to 11.2% for the equity issuers in which Spanish funds invest. These results could be interpreted as *prima facie* evidence that Spanish issuers are better prepared to face the transition risks deriving from climate change than a group of issuers representative of other countries.

Histograms of transition risk losses on equities FIGURE 4



Source: Issuers, Crisóstomo (2022) and CNMV.

Table 5 brings together various statistical data for the different sectors on their expected losses. As expected, the energy sector presents a higher expected loss, as well as a higher standard deviation. These results could be due to the fact that this sector contains the companies that emit most GHGs and, at the same time, some companies that are specialised in the generation of electricity from renewable sources and emit almost no GHGs. On the opposite side is the financial sector, which presents the lowest expected loss and dispersion. The results of the consumer goods and services sector should also be highlighted. This presents a high expected loss, as well as a standard deviation above the average for all sectors. A large dispersion is also observed between its maximum and its minimum. An important part of this dispersion is due to the fact that this sector comprises a greater number of companies than other sectors, with a great variety of business models.

If the average loss weighted by company revenues is calculated within each sector, it is observed that in the energy, industrial, and consumer goods and services sectors, this average is lower than the simple average. In other words, the expected losses for the largest companies are lower and, therefore, it can be deduced, as in the analysis of other metrics, that these companies are currently better prepared to face the challenges of climate change.

Spanish securities issuers' expected loss due to transition risk TABLE 5

%

	Average	Standard deviation	Weighted average	High	Low
All sectors	-10.8	7.2	-9.1	-35.6	0.0
Financial sector	-3.7	4.0	-4.2	-11.4	-0.1
Energy sector	-14.7	10.6	-13.3	-32.6	0.0
Construction and real estate sector	-13.4	4.4	-14.5	-24.4	-9.1
Industrial sector	-9.6	5.3	-5.5	-24.7	-0.8
Consumer goods and services sector	-12.0	7.8	-10.4	-35.6	-1.3

Source: Crisóstomo (2022) and CNMV.

Finally, it is worth remembering that the analyses carried out in this work are based on information that companies provide to the stock markets. In general, issuers are under the scrutiny of third parties such as auditors, credit rating agencies or other certifying bodies that validate, at least in part, the information published by them. However, in the case of information relating to climate change, at the moment, it is not so easy to validate the information that a company provides, either about its historical emissions and current policies or, above all, about its plans for the future. Therefore, it is possible that some companies may have incentives to provide the market with information with an upward bias in relation to their present and future efforts against climate change (Delmas and Burbano, 2011). The phenomenon of providing excessively optimistic information that increases expectations that a company will reduce its GHG emissions or that it will reduce transition or physical risks in the future is called greenwashing.

This paper presents an indicator designed to point to the existence of greenwashing on the part of companies, or at least serve as first evidence on which to base a more in-depth analysis. For this, the information provided by Refinitiv on issuers' ESG indices has been used. For the current financial year we have taken the overall ESG rating, not just the climate-related rating, given the practical impossibility of separating the components. This leads to the results having limitations. Thus, this information provider publishes two indices annually: the first is built exclusively from the information of each issuer. The second incorporates, in addition to the information disclosed by the issuer, the press reports that question that information. For both indices, 100 is the maximum value that an issuer can obtain. A significant difference between the two indices could be interpreted as a signal of the need for a more in-depth analysis of the veracity of the ESG information provided by the company.

Refinitiv calculates these ratios for 66 of the 99 issuers considered. It is important to note that these 66 issuers generated 96% of the total income of all issuers in the 2019-2021 period, so the results obtained are highly representative. At the same time, it is assumed that small companies that have not been assigned an index value by Refinitiv would obtain lower values on average than those that can be consulted in this database. In other words most of the statistical data presented in Table 6 are a level higher than what could be observed if values for all 99 issuers were available.

Calculations show that both indices grow moderately when calculated using the simple mean. When calculated using a revenue-weighted average, the ESG Index

was flat, while the combined ESG Index decreased in the 2019-2021 period. There is also a great dispersion in the values of both indices, as indicated by the differences recorded between the maximums and minimums. From the comparison between the simple and the weighted mean, it can be deduced that large companies obtain higher values for their indices than do small companies.

The differences between both indices, evaluated by means of the simple average, are small, ranging between 4% and 7%. Therefore, these indicators do not indicate, for the moment, extensive use of greenwashing. Neither does the difference between the two indices when they are weighted by revenues, although this difference is more notable (between 12% and 21%). However, from this latest evidence it could be concluded that large companies are more likely to bias their ESG information, it should be borne in mind that precisely larger companies also have much greater media exposure, which facilitates the creation of a combined index of lower value. Furthermore, it must be stressed that ESG ratings are still in a very early stage, so any conclusions derived from their use should be taken as approximate.

Refinitiv ESG Indices TABLE 6

Index from 0-100

Refinitiv ESG Index					
	Average	**Standard deviation**	**Weighted average**	**High**	**Low**
2019	64.3	17.1	77.7	89.9	11.6
2020	66.9	16.2	77.2	89.6	14.2
2021	68.0	14.6	77.7	87.2	14.4
Combined Refinitiv ESG Index[1]					
	Average	**Standard deviation**	**Weighted average**	**High**	**Low**
2019	61.7	16.8	68.4	89.7	11.6
2020	62.0	14.9	61.1	88.4	14.2
2021	64.3	14.1	65.4	86.6	14.4

Source: Refinitiv and CNMV.

1 The ESG Refinitiv Combined Index is constructed using public information provided by the company corrected for news about that issuer that might call into question its information.

5 Analysis of issuers of securities belonging to the energy sector

This section of the paper is dedicated exclusively to companies in the energy sector, given the significance of their emissions within the total, as indicated in previous sections (see annex II). Table 7 shows the annual GHG emissions, total and segregated by scope, of the energy sector and all the other sectors between the years 2018 and 2021. The last column shows the percentage of emissions generated by companies in the energy sector with respect to the total.

GHG emissions of the energy sector and of all companies[1] TABLE 7

	Energy sector[2, 3]	All sectors[2, 3]	Energy sector percentage (%)
Scope 1 emissions			
2018	85.4	140.4	60.8
2019	70.9	121.6	58.3
2020	60.0	92.3	65.0
2021	56.6	90.4	62.5
Scope 2 emissions			
2018	5.7	14.4	39.6
2019	5.0	13.1	38.6
2020	4.7	12.0	39.1
2021	4.2	11.3	37.1
Scope 3 emissions			
2018	407.5	462.3	88.1
2019	398.9	458.4	87.0
2020	362.4	428.4	84.6
2021	369.9	432.4	85.6
Total emissions			
2018	498.6	617.1	80.8
2019	474.8	593.1	80.1
2020	427.1	532.7	80.2
2021	430.7	534.1	80.6

Source: Issuers, Bloomberg and Refinitiv.

1 Aggregate emissions are calculated from companies that provide data on their carbon footprint.

2 Emissions are expressed in millions of tons of CO_2.

3 The companies included in the energy sector and in the total set are listed in annex II.

GHG emissions have been reduced in recent years both in the energy sector and in all sectors, for all scopes, a trend that has already been described above. Energy companies generated 62.5% of total scope 1 emissions in 2021, a similar percentage to that registered in the four previous years. Regarding scope 2 emissions, the vol-

ume of which was much less than that of scope 1, the percentage generated by the energy sector showed a slightly decreasing trend from 2018 (39.6%) to 2021 (37.1%). For companies in emission-intensive sectors, such as the energy sector, scope 1 and 2 GHG emissions are especially significant.[23] The proportion of the energy sector's scope 3 emissions[24] also followed a downward trend, standing at 85.6% of the total in 2021 (88.1% in 2018).

5.1 Alignment of the GHG emission reduction objectives of companies in the energy sector with the Paris Agreement

Advances in renewable energy production and storage technologies, as well as the evolution of electricity demand allow energy companies to establish ambitious emission reduction plans. These factors could help issuers achieve the targets set by the European Commission (net neutral GHG emissions by 2050).[25] However, the decarbonisation process necessary to achieve net neutrality will require changes in business models that promote sustained growth in renewable electricity production and a significant reduction in power generation from fossil fuels.[26]

In this context, many organisations have announced targets to fight climate change. These objectives can be expressed quantitatively (volumes or thresholds) or qualitatively. Companies usually set a time horizon in which they commit to achieving a specific objective in order to manage the risks and opportunities deriving from climate change. One of the commonest objectives is the reduction of GHG emissions.[27]

Of the ten companies in the energy sector considered (see annex II), four sent responses to the CNMV's questionnaire and for another four information has been obtained through their financial reports and other databases (Bloomberg and Refinitiv) on their net GHG emission neutrality commitments. Three of these eight companies for which information is available have indicated the objective of achieving neutrality in GHG emissions before the year 2050. These three companies emitted around 65% of the total GHG emissions of all companies considered in the energy sector in 2021. Of the five companies that have not indicated a GHG emissions neutrality commitment, three have communicated partial reduction targets.

Table 8 summarises the emission reduction targets of companies in the energy sector. All those that sent a response to the CNMV's questionnaire indicated that their objectives were based on science. However, we found that the objectives had not been verified in all cases. Some issuers state that in formulating their objectives they incorporate the recommendations of the STBi association, but that this does not currently allow companies in some sectors (gas and oil) to send objectives. Other issuers indicate that their objectives are in the verification phase.

23 See TCFD (2021b).

24 It should be borne in mind that companies find it difficult to obtain relevant detailed information on which to base quantification of scope 3 emissions. There are also methodological issues such as double counting and the need to define clear boundaries in a company's value chain that complicate the measurement of these emissions. All these difficulties can affect the comparability, coverage, transparency and reliability of scope 3 emissions (see TCFD, 2021b).

25 See European Commission (2021).

26 See SBTi (2020).

27 See TCFD (2021b).

GHG emission reduction targets in the energy sector TABLE 8

Organisation	Base year[1]	Scope	GHG reduction targets
Enagás[3]	2014	i) 1 and 2, ii) 3[2]	i) 74% by 2030 and neutrality by 2040, ii) 25% by 2030 and 50% by 2040
Endesa[4]		1, 2 and 3	Net zero emissions by 2040
Iberdrola[5]	2017	1, 2 and 3	43% in 2030 and emissions neutrality in 2050
Naturgy[6]	2017	i) 1 and 2, ii) 3	i) 48% by 2025, ii) 20% by 2025
Red Eléctrica[7]	2019	i) 1 and 2, ii) 3	i) 55% by 2030, ii) 28% by 2030
Repsol[8]	2016	i) 1 and 2, ii) 1, 2 and 3	i) 55% by 2025, ii) 30% by 2030 and net zero emissions by 2050

Source: Securities issuers.

1 Year with respect to which the emission reduction targets are established.

2 The base year is 2021 and 10 GHG Protocol categories are covered (1, 2, 3, 4, 5, 6, 7, 9, 11 and 15).

3 Source: Questionnaire and Enagás (2022).

4 Source: Questionnaire.

5 Source: Questionnaire and SBTi (2021).

6 Source: Naturgy (2022).

7 Source: Questionnaire.

8 Source: Repsol

Issuers also indicated other objectives in their responses to the questionnaire, including investment in projects aimed at boosting renewable energy generation and adapting to the decarbonisation process by reducing the intensity of scope 1 and 2 emissions.[28]

In their responses to the questionnaire, companies in the gas sector indicated that their investment projects would focus on the production of renewable gases (biomethane and hydrogen), the adaptation of their infrastructures to allow the incorporation of hydrogen and the promotion of natural gas in transport, especially maritime and heavy road transport. With these investments, they will endeavour to replace the most polluting fossil fuels and launch other sustainable businesses and technologies that allow the energy transition.

Other issuers also mentioned in their strategic reports investment in projects related to industrial transformation for the production of low-carbon fuels and the capture and storage of carbon dioxide.[29] The technologies associated with the removal of carbon dioxide from the atmosphere are based on direct capture from the air and reforestation. Despite the fact that their development is necessary to limit global warming, in conjunction with the transformation of the energy sector, these technologies are subject to risks and a high degree of uncertainty.[30]

Organisations' remuneration policies are also a key mechanism for aligning their objectives with the decarbonisation process and they provide information on their level of commitment to the challenges deriving from climate change. In their responses to the questionnaire, all issuers state that they have a variable remuneration component linked to the achievement of climate change targets. This compo-

28 As electricity generation is the main source of emissions from the energy sector, one of the most relevant intensity measures is GHG emissions per kilowatt hour produced. See SBTi (2021) and SBTi (2020).

29 See Grupo Repsol (2021).

30 See SBTi (2021) and SBTi (2020).

nent usually applies to managers and directors and takes into account GHG emission reductions both in absolute terms and in intensity.[31] Other objectives are also considered, such as the installed capacity of renewable sources and the number of suppliers subject to sustainable development policies and standards.

5.2 Risks and opportunities deriving from climate change and the decarbonisation process

Organisations often carry out an analysis of the potential impact of risks and opportunities related to climate change and their implications for their activity based on different future climate scenarios. The responses to the questionnaire reveal that the scenarios most used by companies in this type of analysis are those provided by the International Energy Agency (IEA) and those of the Intergovernmental Panel on Climate Change (IPCC). The IEA scenarios are: i) the Stated Policies Scenario (STEPS), which offers a conservative perspective, since it does not assume that governments will meet their objectives, and explores the effect of existing measures already announced by regulators; ii) the scenario of net zero emissions in 2050 (NZE); and iii) the sustainable development scenario (SDS), consistent with the objectives established in the Paris Agreement.[32] The IPCC describes four possible scenarios for GHG emissions in the 21st century: a strict mitigation scenario (RCP 2.6), two intermediate scenarios (RCP 4.5 and RCP 6.0) and a scenario with very high GHG emissions (RCP 8.5).[33] Companies generally use different scenarios depending on whether they are assessing transition or physical risks.

Climate risks affect all companies to a lesser or greater extent due to their systemic component.[34] Linked to them, one issuer pointed out the significance of the risks of deteriorating creditworthiness of counterparties (suppliers and banks), of social phenomena (humanitarian crises, impact on harvests and fishing, refugee crisis and epidemics) and of greater competition for financial resources.

Organisations in the energy sector may have significant exposure to transition risks and, in some cases, are dependent on the availability of water resources (exposure to physical risk). In the structural shift towards a low carbon economy, the asset value of these organisations could be negatively affected by the impact of regulatory, technological and market risks. In this regard, energy companies are particularly sensitive to changes in the demand for fossil fuels, energy production and restrictions on GHG emissions.[35]

The financial impact of the risks and opportunities deriving from climate change will be of a different magnitude for each company and will generally depend on its type of activity. For example, companies whose production has a higher proportion of renewable energy will have a higher percentage of low-emission activity and are therefore likely to be less exposed to transition risks of the decarbonisation process. In contrast, some companies in the gas sector reported having a higher exposure to transition risks than to physical risks. Other companies are currently in the process of quantifying their exposure to physical risks.

31 In the energy industry it is common for intensity objectives to be expressed in Kwh generated.

32 See IEA (2021).

33 See IPCC (2014).

34 See ECB (2022).

35 See TCFD (2021a).

Organisations can try to mitigate transition and physical risks by reducing the exposure of their assets to those risks and can set investment targets to take advantage of opportunities they have identified in the context of decarbonising the economy. Table 9 summarises some of the risks and opportunities identified by the organisations, as well as the measures they have proposed for mitigating them or profiting from them, classified by subsector: oil and gas, and electricity.

Risks and opportunities deriving from climate change TABLE 9

Oil and gas sector		
Transition risks		
Public policy	–	The growth in demand for fossil fuels will be affected by regulations that promote the use of renewable energy.
	–	Need to reduce GHG emissions at a faster rate and accelerate the decarbonisation process.[1]
	–	Possible mitigation measures: gas production from renewable sources (biomethane and hydrogen) and development of carbon dioxide removal technologies.
Technological	–	Technological innovations that improve the operational efficiency of facilities for the production, distribution and storage of electricity on a large scale.
Market	–	Shifts in the basket of primary energy sources towards others with less carbon intensity;[2] for example, an increase in competition from renewable energy providers (marketing of electric cars) that reduces the demand for fossil fuels.
	–	Increase in operating costs due to high carbon dioxide emission prices.
	–	Difficulty in obtaining financing for projects not aligned with the reduction of GHG emissions.[1]
	–	Loss of value of the organisation's assets (stranded assets).[1]
	–	Possible mitigation measures: diversification of the portfolios of organisations with products with low GHG emissions.
Reputational	–	Negative perception by public opinion and stigmatisation of companies operating in the fossil fuel sector.
	–	Possible mitigation measures: development of communication strategies in the media and social networks, and increased transparency and interaction with stakeholders.
Physical risks		
Acute	–	Increased severity of weather events such as floods or fires that could cause physical damage to company assets and interrupt energy production and supply.
	–	Possible mitigation measures: risk coverage for natural disasters, infrastructure adaptation, contingency and business continuity plans.
Chronic	–	Changes in weather patterns (precipitation and temperatures) that could affect the amount of energy demand and cause fluctuations in it.
Opportunities		
Development and expansion of low emission products and services	–	Development of renewable gases (biomethane and hydrogen) and clean fuels, which could be an alternative in sectors where electrification is not possible.

Risks and opportunities deriving from climate change *(continuation)* TABLE 9

Electricity sector		
Transition risks		
Public policy	–	Regulatory and fiscal changes that affect GHG emissions.
	–	Regulation on resilience.
	–	Uncertainty about incentives and aid for the development of renewable energies.
Technological	–	Uncertainty about technological development to promote the energy transition. For example, certain emerging technologies could pose a risk to organisations that have not anticipated innovation processes and have invested in well-established technologies.
Market	–	Variability of raw material prices.
Physical risks		
Acute	–	Increased severity of weather events such as floods, fires, heat waves and cold spells, and strong winds that could cause physical damage to company assets and disrupt energy production and supply. These interruptions could have a significant financial impact deriving from contractual energy supply commitments, forcing affected companies to purchase energy in spot markets at times of production shortfalls or demand peaks.
	–	Possible mitigation measures: risk management in the event of natural disasters, adaptation of infrastructures (underground lines, materials resistant to high temperatures), contingency and business continuity plans, and improvement of weather forecasting systems.
Chronic	–	The variation in the average temperature level could have an effect on electricity demand and on the useful life and efficiency of some assets such as solar panels or wind turbines.
	–	The variations in rainfall could limit the water available for hydroelectric production and cause damage to equipment and infrastructure due to flooding.
	–	In addition to variability in water availability, changes in solar and wind resources could have an impact on the renewable energy business.
	–	Possible mitigation measures: diversification of energy sources, geographic diversification of reservoirs, development and improvement of technologies that make it possible to generate electricity with reduced water resources, process optimisation, and increased asset resilience.
Opportunities		
Development and expansion of low emission products and services	–	Organisations whose production is partially or totally based on renewable energy will be able to absorb the increase in demand for this type of energy that will foreseeably occur in the decarbonisation process.
Funding	–	Advantages in attracting financing by organisations with sustainable and resilient business models.
Variability of temperatures	–	Increase in aggregate demand for electricity in some geographical areas.

Source: Issuers (responses to the questionnaire) and CDP.

1 Source: Naturgy (2022).

2 Source: Repsol (2022).

6 Conclusions

The climate challenge has become one of the main challenges globally. As a consequence, the European Union, and by extension Spain, has made it one of its public policy priorities. The main objective is to achieve the goal set by the EU of reducing net GHG emissions to zero by 2050 and thereby making a decisive contribution to halting global warming. In order to achieve this ambitious objective, it is necessary to know the contribution of the different economic agents to GHG emissions and measure the pace of the move towards a decarbonised economy.

In this regard, large companies contribute decisively to GHG emissions. This paper attempts to provide a first approximation to the extent to which Spanish securities issuing companies emit GHG and how these have changed in recent years, specifically from 2018 to 2021. It also seeks to ascertain their plans for the future and the extent to which they are aligned with the objectives of the Paris Agreement and the EU. To carry out the work, several data sources have been used: a questionnaire prepared by the CNMV and sent to a group of issuers of securities and information from the Bloomberg and Refinitiv commercial databases. The voluntary response questionnaire was sent to 99 companies. The questionnaire requested information both on historical GHG emissions and future reduction objectives, as well as on the risks and opportunities for respondents' business deriving from the challenge of climate change. A response was obtained from 41% of the entities.

An initial conclusion of the study is the need to continue to look in greater depth at improving the quality and level of detail of the information on GHG emissions and on the management of physical and transitional risks. The volume of information on this type of emissions has increased significantly in recent years, but it is still far from complete. For example, in 2021 only 49 of the 99 reference companies offered public data on their total GHG emissions and another 15 did so partially, only reporting scopes 1 and 2. This number is even lower if companies that present quantitative data on their future forecasts in relation to their GHG emissions are considered. In general, it has been observed that the companies that do not offer information tend to be the smaller ones. This data limitation could be temporary, as European regulation aims to establish an obligation for securities issuers to calculate and publish data on their carbon footprint.

Data quality has also been improving in recent years, although reservations remain. In this regard, the different companies have incorporated improvements in their calculation methodologies that allow them to estimate their emissions more consistently. However, there is room to improve these calculations, especially in certain sectors such as finance, in the area of their scope 3 emissions. Information quality problems are also related to the possible double counting of some emissions.

Despite the limitations that exist in terms of the quantity and quality of the information available, it is considered that the data obtained from the sources considered

cover a broad spectrum and provide a first approximation to the GHG emissions of large Spanish companies.

According to the information obtained, the GHG emissions of the companies that offer this type of information amounted to 532.9 million tons of CO_2 in 2021 if we directly aggregate the data of each of the three scopes. This figure is slightly less than double those registered for the whole of Spain, which would indicate that this type of company carries out a large part of its activity outside the country. By scope, most of the emissions come from scope 3 (431.4 million tons), followed by scope 1 (90.4 million) and, to a lesser extent, by scope 2 (11.1 million). Regarding distribution by sector, the energy sector is the most significant, accounting for 80.8% of the total, followed at a great distance by the rest of the productive sectors. Emission intensity is also dominated by the energy sector. The fact that information is not available for all issuers implies that these figures should be considered a lower bound with respect to the total.

Regarding trends over time, it can be seen that in the period 2018-2021 emissions declined appreciably, by 13.7%. This was mainly due to the effort made by issuers to contain scope 1 and 2 emissions. Scope 3 emissions also decreased, but at a slower rate. Large companies are evidently making a great effort to reduce the emissions that they directly control. This effort seems to be less with respect to activities related to third parties.

Regarding the available forecasts of future reductions of GHG emissions by large companies, we see that they expect to continue significantly reducing their scope 1 and 2 emissions. These forecasts would mean that, for these scopes, Spanish issuers would be relatively aligned with the provisions of the Paris Agreement and EU legislation. On the other hand, when forecasts for scope 3 emissions are incorporated, the reduction of GHG emissions in the future would not be enough to achieve this alignment with the objectives of the EU and would be at the limit of being able to comply with the Paris Agreement.

Some of the questions in the questionnaire sent to issuers of securities allowed us to draw up an index which seeks to measure issuers' performance as regards climate change, although the quality of the data provided was not analysed. In any case, the distribution of the values of this index shows that the major Spanish corporations are investing time and effort in measuring and managing the risks deriving from climate change. In the future, it would be advisable for this index to be able to evaluate issuers' strategies for dealing with climate change. The other conclusion that can be drawn is that larger companies provide more information on the management of the challenges arising from climate change than other, smaller, companies. Once again, the limitations of these conclusions should be kept in mind when extrapolating them due to the partial coverage of the information.

To complete the analysis in other aspects of interest, the results of the work by Crisóstomo (2022) focused on the transition risk for investment funds have been used. This work assesses the transition risk of Spanish securities issuers whose stocks are present in the portfolios of Spanish funds. In the reference work, the author estimates the transition risk for investment funds registered with the CNMV by aggregating the expected losses of each of the securities that make up the funds' portfolios. These securities come from Spanish issuers and issuers from 66 other jurisdictions. Based on the expected losses of the various equities, the distribution functions linked to the transition risks of both Spanish issuers and issuers from

other jurisdictions have been calculated. From the comparison of both distributions, it can be deduced that Spanish issuers present in these portfolios are better prepared to face this risk, since they present a lower expected loss than issuers from other countries and also a lower dispersion.

Finally, we presented an analysis comparing information from issuers themselves with an information indicator adjusted for unfavourable ESG news known about them. This analysis, which is based on Refinitiv's ESG ratings, is a first step towards, in the future, identifying potential incentives for issuers to publish non-financial information that overestimates their climate change efforts (greenwashing). The results of this preliminary exercise do not suggest that this phenomenon is occurring in a generalised way, but we infer the need to continue to carry out more in-depth analysis in this area.

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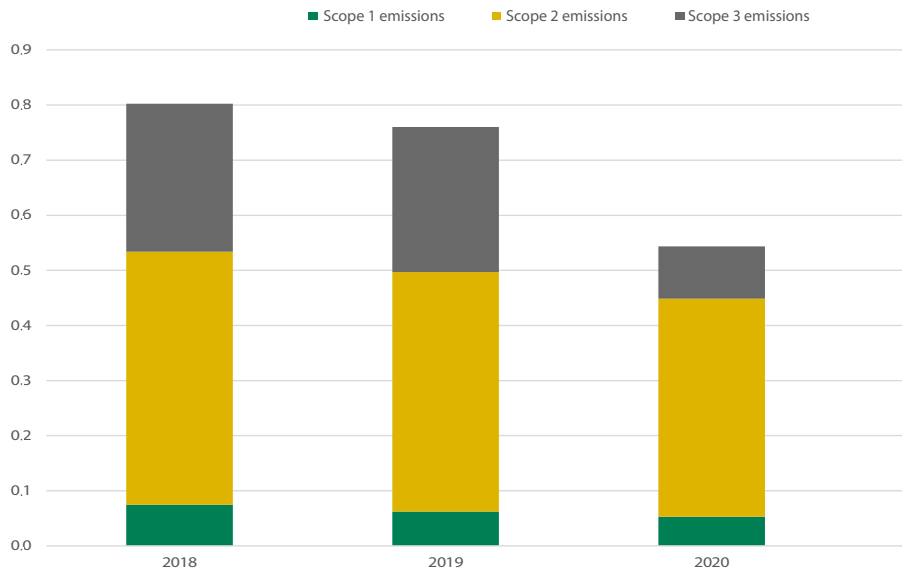
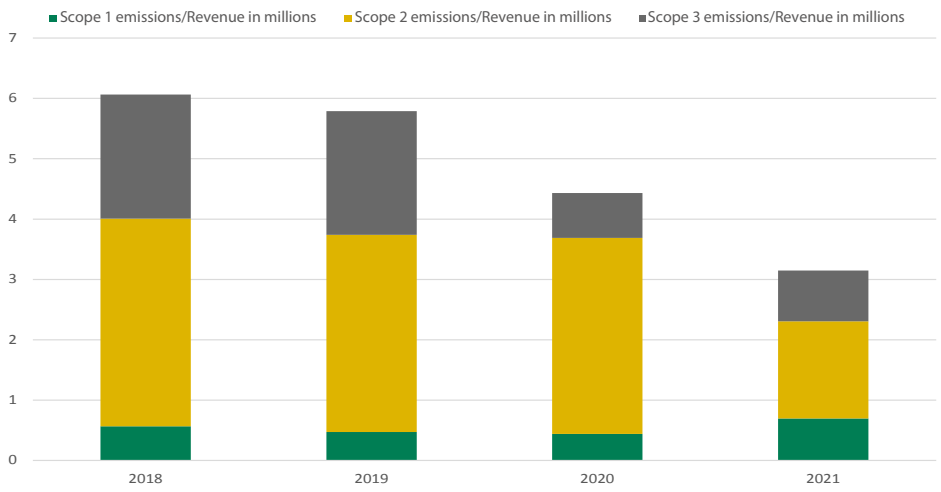
Annex I GHG emissions by business sectors (millions of tons of CO_2)

GHG emissions of the financial sector FIGURE I.1



Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the financial sector (intensity) FIGURE I.2



Source: Issuers, Bloomberg and Refinitiv.

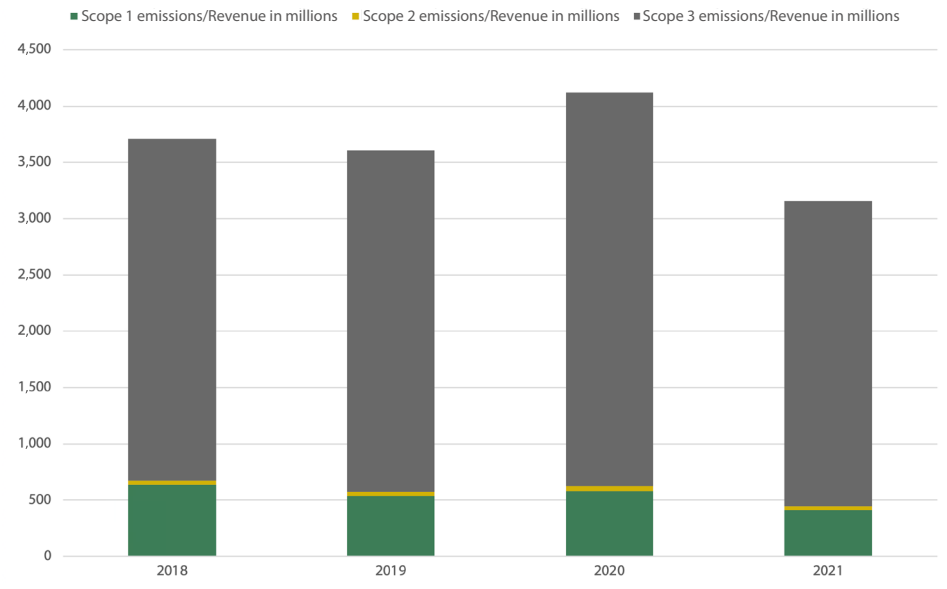
GHG emissions of the energy sector

FIGURE I.3

Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the energy sector (intensity)

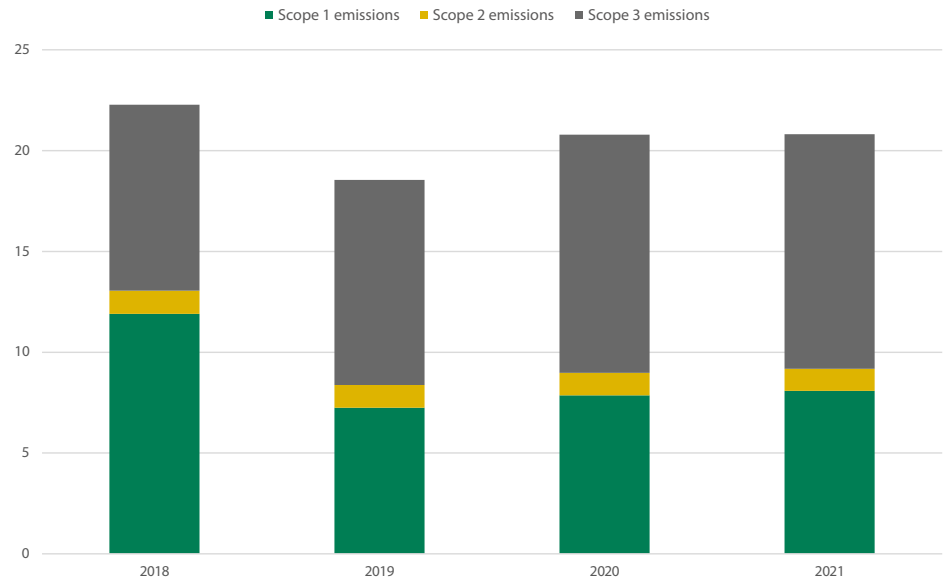
FIGURE I.4



Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the construction and real estate sector

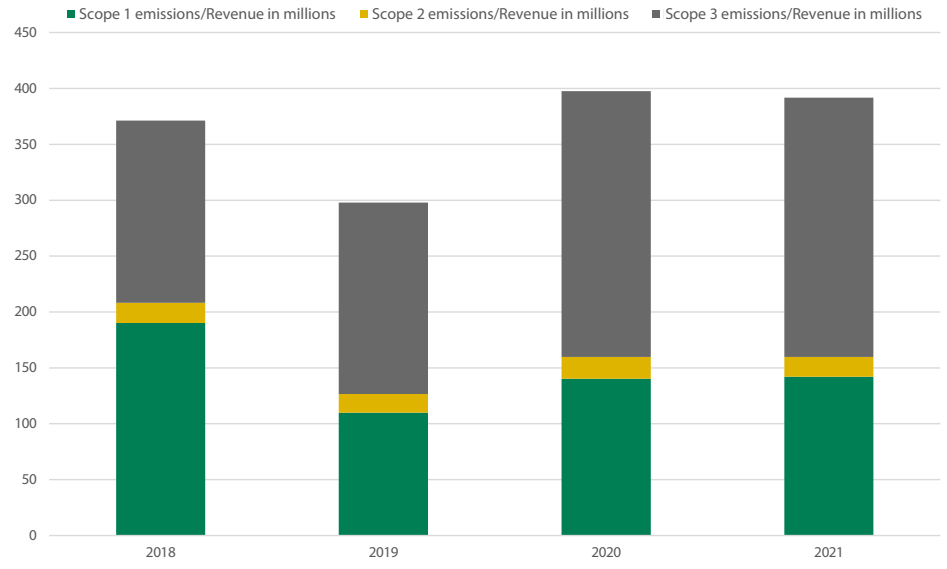
FIGURE I.5



Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the construction and real estate sector (intensity)

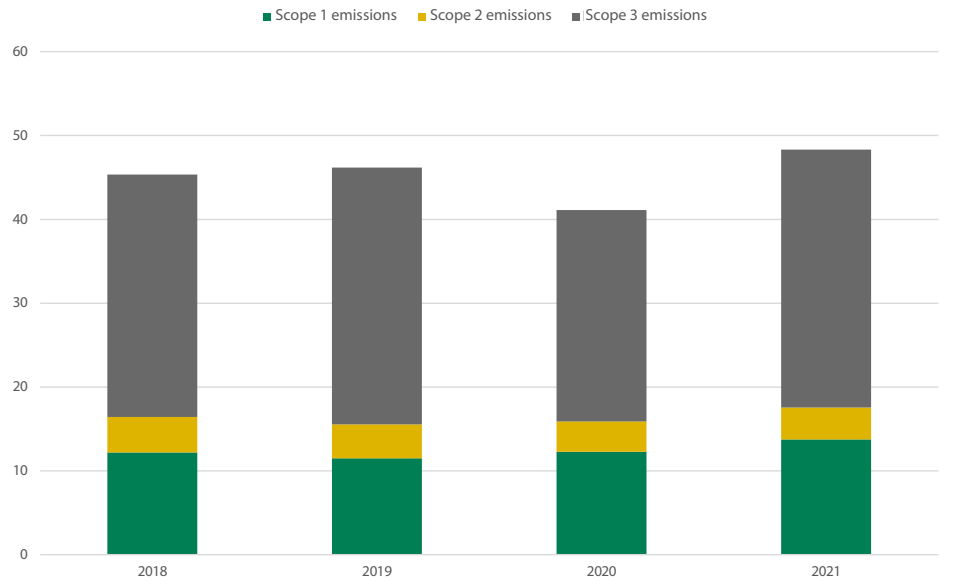
FIGURE I.6



Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the industrial sector

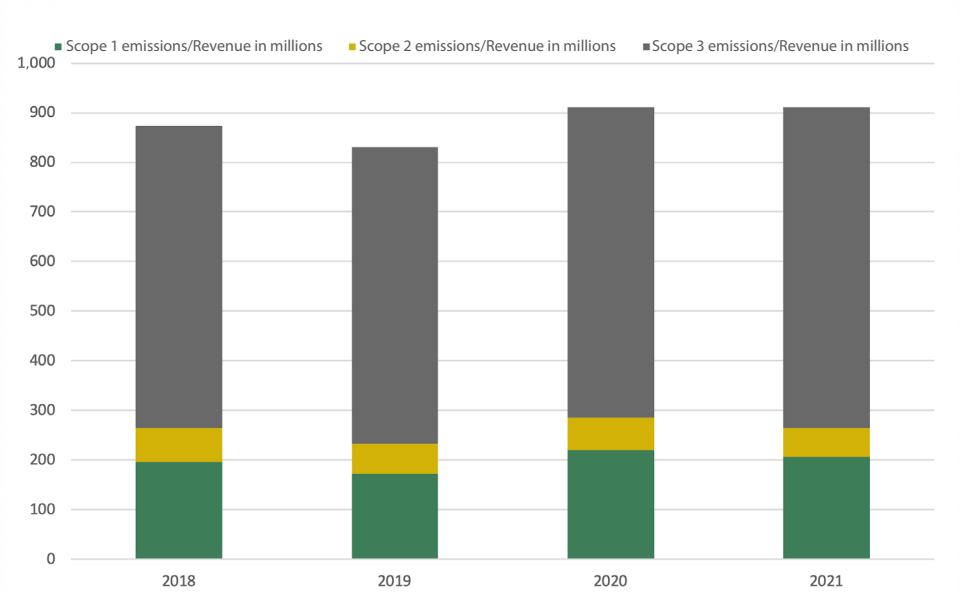
FIGURE I.7



Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the industrial sector (intensity)

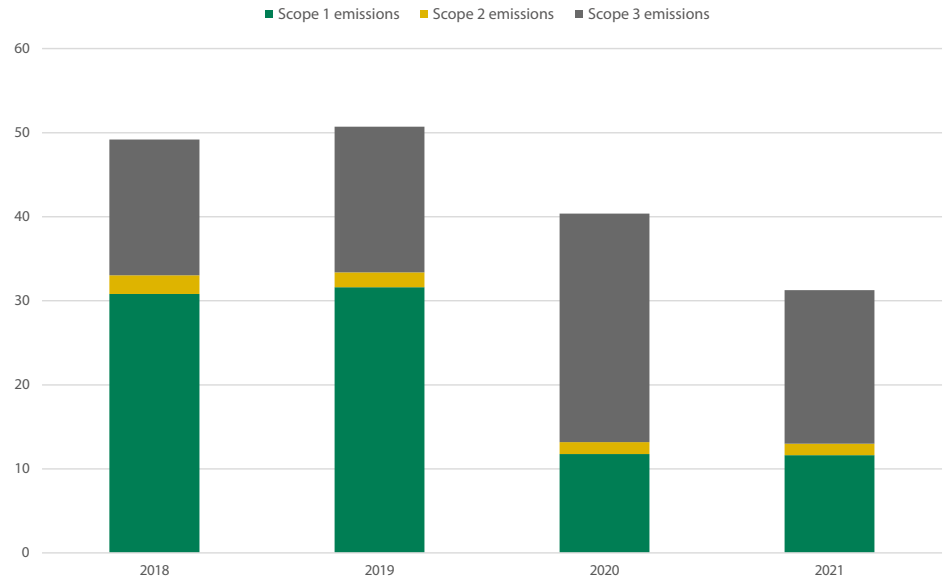
FIGURE I.8



Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the consumer goods and services sector

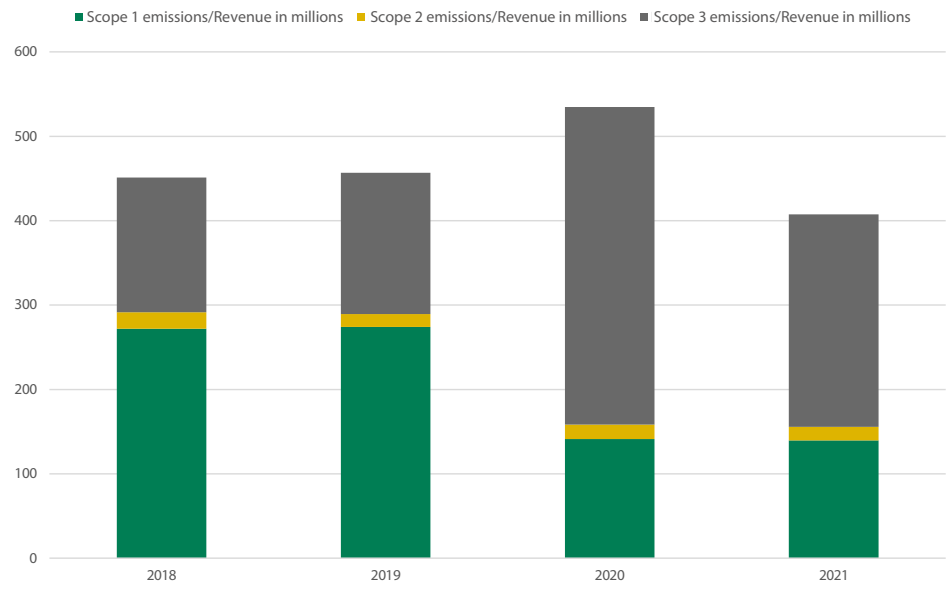
FIGURE I.9



Source: Issuers, Bloomberg and Refinitiv.

GHG emissions of the consumer goods and services sector (intensity)

FIGUREI .10



Source: Issuers, Bloomberg and Refinitiv.

Annex II List of Spanish issuers at the end of 2021 by sector of activity

Financial sector

BANCO SABADELL
BANCO SANTANDER
BANKINTER
BBVA
CAIXABANK
CATALANA OCCIDENTE
CORP FINANCIERA ALBA
DEUTSCHE BANK SAE
IBERCAJA BANCO
MAPFRE
RENTA 4 BANCO
UNICAJA BANCO

Energy sector

AUDAX RENOVABLES
EDP RENOVÁVEIS
ENAGÁS
ENDESA
IBERDROLA
MINERSA
NATURGY
RED ELÉCTRICA
REPSOL
SOLTEC POWER

Construction and real estate sector

ACCIONA
ACS
AEDAS HOMES
CLEOP
FCC
FERROVIAL
NEINOR
OHL
SACYR
SAN JOSÉ
URBAS

Industrial sector

ACERINOX
ADOLFO DOMÍNGUEZ
ALMIRALL
AMREST
AZKOYEN
BORGES AGRICULTURE & INDUSTRIAL NUTS
CAF
CIE AUTOMOTIVE
DEOLEO
DURO FELGUERA
EBRO FOODS
ELECNOR
ENCE
ERCROS
FAES
GAM
GESTAMP AUTOMOCIÓN
GRIFOLS
IBERPAPEL
INDITEX
LABORATORIOS ROVI
LINGOTES ESPECIALES
LIWE
MIQUEL COSTAS
MOLINS
NATURHOUSE
NICOLÁS CORREA
NUEVA EXPRESIÓN TEXTIL
PHARMA MAR
SIEMENS GAMESA
TALGO
TÉCNICAS REUNIDAS
TUBACEX
TUBOS REUNIDOS
VIDRALA
VISCOFAN
ZARDOYA OTIS

Consumer goods and services sector

AENA
AIRTIFICIAL
ALANTRA
AMADEUS IT
AMPER
APPLUS
ATRESMEDIA
ATRYS
BAVIERA
CELLNEX TELECOM
DIA
EDREAMS ODIGEO
EROSKI
FLUIDRA
GLOBAL DOMINION
GRUPO EZENTIS
INDRA SISTEMAS
INTERNATIONAL CONSOLIDATED AIRLINES
LOGISTA
MEDIASET
MELIÁ
NH HOTELS
PRIM
PRISA
PROSEGUR
PROSEGUR CASH
REIG JOFRE
TELEFÓNICA
VOCENTO

Annex III Questionnaire sent to issuers of securities that meet the requirements established in Article 32.1 of Law 7/2021, of 20 May, on climate change and ecological transition

	NOMBRE DEL EMISOR:	
CB	**CAPITALIZACIÓN BURSATIL a 31/12/21 en miles €**	
M	**MERCADO**	
SEC	**SECTOR DEL EMISOR**	
REF:	**PREGUNTA**	**RESPUESTA**
	GOBERNANZA	
Q1	**¿Cuenta su entidad con políticas y procedimientos de diligencia debida relacionados con la adaptación o mitigación del cambio climático?** En caso afirmativo faciliten una breve descripción en el apartado de Comentarios.	**Ninguna de las respuestas anteriores (explicar en comentarios)**
C1	**Observaciones:** *Las Directrices 2017/UE de la CE sobre información no financiera destacan que puede ocurrir que una sociedad no haya elaborado políticas sobre determinados asuntos que considere importantes, en cuyo caso debe proporcionar una explicación clara y razonada sobre por qué no lo ha hecho. Las citadas directrices añaden que las sociedades adoptan procedimientos de diligencia debida para asegurar la realización de un objetivo concreto (por ej. que las emisiones de carbono estén por debajo de un determinado nivel), de modo que ayudan a detectar, impedir y mitigar efectos adversos existentes y potenciales.*	**Comentarios:**
Q2	**En caso de respuesta afirmativa a la pregunta anterior, ¿han sido dichas políticas aprobadas por el Consejo de Administración?**	**N/A**
C2	**Observaciones**: *Las "Directrices sobre la presentación de informes no financieros: Suplemento sobre la información relacionada con el clima" de la CE de junio 2019 (en adelante Suplemento del clima) señala que los sistemas de gobernanza y control son fundamentales para que las partes interesadas conozcan la solidez del planteamiento de una empresa en relación con las cuestiones relacionadas con el clima. Las indicaciones acerca de la implicación del Consejo de administración y la Dirección, en particular sus responsabilidades respectivas en lo referente al cambio climático, permiten a los interesados conocer el nivel de concienciación de la empresa con las cuestiones relacionadas con el clima.*	**Comentarios:**
Q3	**¿Cómo ejerce el Consejo de Administración su labor de supervisión y control sobre:**	
	los riesgos y oportunidades relacionados con el cambio climático?	**Ninguna de las respuestas anteriores**
	los avances alcanzados respecto a las políticas, objetivos y estrategia climática?	**Ninguna de las respuestas anteriores**
C3	**Observaciones:** *El Suplemento del clima recomienda describir la supervisión de los riesgos y oportunidades relacionados con el clima ejercida por el Consejo de Administración. Asimismo, las recomendaciones del Task force on Climate-related Financial Disclosures (TCFD) de 2017 ponen de manifiesto la importancia de informar acerca de cómo el Consejo de Administración supervisa y controla el progreso respecto a las metas y objetivos para abordar los temas relativos al clima y si toma en consideración los asuntos relacionados con el clima cuando revisa la estrategia, planes de acción importantes, políticas de gestión de riesgo, establecimiento de objetivos, importantes desembolsos de capital, etc*	**Comentarios:**
Q4	**Indiquen la frecuencia con la que el Consejo es informado sobre los asuntos relacionados con el clima:**	
C4	**Observaciones:** *Las recomendaciones del TCFD ponen de manifiesto la relevancia de informar acerca de los procesos y frecuencia con la que el Consejo es informado sobre los asuntos relacionados con el clima.*	**Comentarios:**
Q5	**¿Ejerce la Dirección una labor de evaluación y gestión de los riesgos y oportunidades relacionados con el clima?**	**(explicar en comentarios)**
C5	**Observaciones:** *El Suplemento del clima recomienda describir el papel de la dirección en la evaluación y gestión de los riesgos y oportunidades relacionados con el clima, junto a la justificación del enfoque.*	**Comentarios:**
Q6	**Indiquen si la compañía cuenta con algún órgano social al que se atribuyan funciones específicas relacionadas con el clima. En caso afirmativo describan el órgano y su cometido en el espacio destinado a Comentarios.**	**No existe organismo concreto con funciones relativas al clima**
C6	**Observaciones:** *El TCFD recomienda describir la(s) estructura(s) organizativa(s) relacionada(s) con responsabilidades de evaluación y gestión de las cuestiones relacionadas con el clima.*	**Comentarios:**
Q7	**Revelen qué persona u órgano es el máximo responsable de la ejecución de la política y estrategia climática de la entidad.**	**(explicar en comentarios)**
C7	**Observaciones:**	**Comentarios:**
Q8	**¿Tiene la compañía acceso a conocimientos especializados sobre cuestiones relacionadas con el clima, ya sea a través de su propia capacidad interna o de fuentes externas?** Describir en Comentarios cuáles son las fuentes internas y/o externas.	**No dispone de acceso a conocimientos especializados sobre clima**
C8	**Observaciones:** *El Suplemento del clima recomienda facilitar esta información, precisando de qué manera y a qué niveles (en particular, el consejo de administración y la alta dirección). En caso de que exista uno o más consejeros con knowhow sobre cuestiones relacionadas con el clima, indiquen su nombre, conocimientos y experiencia relevante en esta materia en el apartado de Comentarios y faciliten un enlace a su curriculum vitae* en la web de su entidad.	**Comentarios:**
Q9	**¿Se ha establecido algún componente de remuneración variable, para los trabajadores, directivos y consejeros ejecutivos de la Compañía, incluidos los miembros del Consejo de Administración, ligada a la consecución de objetivos climáticos?** En caso afirmativo describan el/los objetivo(s) en el espacio destinado a Comentarios.	**Actualmente en desarrollo**
C9	**Observaciones:** *El Suplemento del clima recomienda indicar si la política de remuneración de la empresa tiene en cuenta los resultados relacionados con el clima, incluidos los resultados frente a los objetivos fijados, y de qué manera.*	**Comentarios:**
	ESTRATEGIA Y GESTIÓN DEL RIESGO	
Q10	**¿Cuenta su entidad con procedimientos destinados a identificar y evaluar los riesgos y oportunidades relacionados con el cambio climático?**	**N/A**
C10	**Observaciones:** *El Suplemento del clima señala que es sumamente importante que los inversores y otras partes interesadas sepan cómo determina la empresa los riesgos relacionados con el clima, cuáles son los principales riesgos que ha identificado y cómo los gestiona.*	**Comentarios:**
Q11	**Como consecuencia de los citados procedimientos ¿se han identificado riesgos significativos relativos a cambio climático?**	**(explicar en comentarios)**
C11	**Observaciones:** *El Suplemento del clima establece que, cuando informen sobre sus riesgos, dependencias y oportunidades relacionados con el clima, las empresas deben, siempre que sea pertinente y proporcionado, tener en cuenta toda su cadena de valor, tanto los eslabones previos como los siguientes. En el caso de las empresas que se dedican a actividades manufactureras, esto significa seguir el ciclo de vida de los productos, teniendo en cuenta las cuestiones climáticas en la cadena de suministro y el abastecimiento de materias primas, así como durante la utilización del producto y una vez que el producto llega al final de su vida útil. Las empresas que prestan servicios, incluidos servicios financieros, también tendrán que tener en cuenta el impacto climático de las actividades que respaldan o facilitan.*	**Comentarios:**
Q12	**Como consecuencia de los citados procedimientos ¿se han identificado oportunidades relacionadas con el cambio climático?**	**N/A**
C12	**Observaciones**: *El Suplemento del Clima establece que con frecuencia, las empresas que ofrecen productos y servicios que contribuyen a mitigar el cambio climático o a adaptarse a él pueden convertir los riesgos relacionados con el clima en oportunidades.* *Entre las oportunidades de negocio que conlleva la adaptación al cambio climático cabe citar las nuevas tecnologías para aprovechar más eficientemente los escasos recursos hídricos o la construcción de nuevas defensas contra las inundaciones, mientras que entre las oportunidades derivadas de la mitigación del cambio climático se citan la energía renovable o la construcción de edificios y el desarrollo de sistemas de transporte más eficientes desde el punto de vista energético.*	**Comentarios:**

Q13	**En la la labor de identificación de riesgos y oportunidades ¿se han considerado diferentes horizontes temporales que reflejen la incertidumbre relacionada con el corto, medio y largo plazo? Indiqué plazos utilizados para definir medio y largo plazo.** Marcar con una "x" el horizonte, en caso afirmativo:	**Sí se han identificado diferentes horizontes (marcar con X)**
	Largo plazo	
	Medio plazo	
	Corto plazo	
C13	**Observaciones:** *El Suplemento del clima destaca la importancia de describir los procedimientos que sigue la empresa para determinar y evaluar los riesgos relacionados con el clima a corto, medio y largo plazo, señalando que es probable que la definición de corto, medio y largo plazo dependa del modelo de negocio de la empresa y del ciclo de vida de sus activos y pasivos.*	**Comentarios:**
Q14	**Respecto a los riesgos del cambio climático sobre las actividades de la compañía, ¿se han detectado riesgos físicos y riesgos de transición?** Marcar con una "x" el tipo de riesgo, en caso afirmativo, especificando en la medida de lo posible en el apartado de Comentarios.	**Ninguna de las respuestas anteriores (explicar en comentarios)**
	Riesgos físicos	
	Riesgos agudos	
	Riesgos crónicos	
	Riesgos de transición	
	Riesgos políticos	
	Riesgos legales	
	Riesgos tecnológicos	
	Riesgos de mercado	
	Riesgos reputacionales	
C14	**Observaciones:** *Los **riesgos de transición** incluyen riesgos:* *- De políticas públicas (ej. derivados de requisitos de eficiencia energética, de la existencia de tarifas de CO2...)* *- Jurídicos (ej. riesgo de litigios por no impedir o minimizar los efectos adversos sobre el clima).* *- Tecnológicos (ej. cuando nuevas tecnologías menos perjudiciales para el clima sustituyen a otras).* *- De mercado (ej. consumidores que prefieren productos y servicios menos nocivos para el clima).* *- De reputación (ej. una reputación de ser perjudicial para el clima conllevará dificultad de atraer y conservar clientes, empleados, socios comerciales e inversores).* *Los **riesgos materiales** derivados de los efectos físicos del cambio climático e incluyen **riesgos:*** *- Materiales agudos: derivan de fenómenos meteorológicos como tormentas, inundaciones, incendios u olas de calor, que pueden dañar las instalaciones de producción y trastornar las cadenas de valor.* *- Materiales crónicos: derivan de cambios a más LP en el clima, (ej. cambios de temperatura, aumento del nivel del mar, menor disponibilidad de agua, pª de biodiversidad ó alteraciones en la productividad de la tierra y del suelo)*	**Comentarios:**
Q15	**Respecto a los riesgos físicos**:	
	¿Se ha desarrollado e implementado un plan de evaluación y gestión de los mismos? En caso afirmativo, indicar en Comentarios en qué fase se encuentra.	**N/A**
	Indiquen el % de la cifra de negocio expuesto a riesgos físicos:	
	Indiquen el % de los activos expuestos a riesgos físicos:	
C15	**Observaciones:** *Los riesgos físicos pueden conllevar repercusiones financieras para las organizaciones como, por ejemplo, daños directos a los activos o impactos indirectos provocados por interrupciones en la cadena de producción.Según el Financial Stability Board (FSB), las pérdidas económicas globales asociadas a catástrofes relacionadas con fenómenos meteorológicos se han duplicado desde la década de 1990, hasta alcanzar un importe de 1,6 billones de dólares estadounidenses en los diez últimos años.*	**Comentarios:**
Q16	**Respecto a los riesgos de transición:**	
	Indiquen el % de la cifra de negocio expuesto a energías fósiles:	
	Indiquen el % de la cifra de negocio expuesto a energía nuclear:	
Q16.1	En en caso de entidades financieras: ¿se ha establecido un precio interno de CO_2 a emplear en los procesos de toma de decisiones, planificación y presupuesto?	**Ninguna de las respuestas anteriores (explicar en comentarios)**
	Si su entidad desarrolla actividades sujetas al mercado de carbono EU Emissions Trading System (ETS), indique:	
Q16.2	¿Dispone la entidad de activos cuya intensidad de emisiones de CO_2 haya requerido la adquisición de derechos de emisión?	**N/A**
	Impacto financiero (importe negativo o, en su caso, positivo en miles € en la Cta Rdos) derivado del precio de los derechos de CO_2 en 2021:	
Q16.3	¿Realiza su entidad proyecciones a futuro según posibles escenarios de precios de los derechos de CO_2?	**Ninguna de las respuestas anteriores**
C16	**Observaciones:** *El % de la cifra de negocio expuesto a energía fósil y nuclear se refiere a aquellas actividades relacionadas con la generación o distribución de energía. Esto es, actividades clasificadas como: B-05, B-06, B-09, H-49.50, y D en la clasificación CNAE (NACE por sus siglas en inglés https://nacev2.com/es). Faciliten, en la medida de lo posible, los códigos CNAE correspondientes a las actividades consideradas, en el apartado de Comentarios.* *En las entidades financieras, la fijación de un precio interno de CO2 conlleva facilitar a las distintas áreas la estimación e identificación de posibles riesgos financieros en sus actividades de préstamo o inversión.* *En relación al impacto financiero derivado del precio de los derechos de CO2 en 2021 señalen los costes incurridos con motivo de la adquisición de derechos o los ingresos obtenidos, en su caso, por la venta de los derechos sobrantes.*	**Comentarios:**
Q17	**¿Ha considerado su entidad el impacto de los riesgos y oportunidades relacionados con el cambio climático sobre los negocios, estrategia y planificación financiera (NEP) de la entidad.**	**N/A**
C17	**Observaciones:** *El Suplemento del clima pone de manifiesto que es muy importante que las partes interesadas entiendan el punto de vista de la empresa sobre la forma en que el cambio climático influye en su modelo de negocio y estrategia. Para informar adecuadamente sobre cuestiones relacionadas con el clima, las empresas tendrán que situarse en una perspectiva a más largo plazo que la que suele ser habitual para la información financiera.*	**Comentarios:**
Q18	**¿Ha considerado su entidad el análisis de diferentes escenarios de cómo pueden evolucionar los riesgos y oportunidades relacionados con el cambio climático?** Describir en comentarios los escenarios considerados.	**N/A**
C18	**Observaciones:** *El Suplemento del clima señala que, con el fin de incorporar adecuadamente los posibles efectos del cambio climático a sus procesos de planificación, las empresas deben considerar la manera en que pueden evolucionar los riesgos y oportunidades relacionados con el clima y sus posibles implicaciones para el negocio en diferentes condiciones. Una forma de evaluar estas implicaciones es mediante el análisis de escenarios.*	**Comentarios:**

Q19 a)	**¿Ha cuantificado su entidad el impacto financiero registrado hasta la fecha en la Cuenta de Resultados y en el Balance derivado de los riesgos y oportunidades relacionados con el cambio climático?** En caso de ser material cuantificar:	**No se ha cuantificado**				
	Impacto en Patrimonio neto (en miles €) de:					
	Riesgos físicos:					
	Riesgos de transición:					
	Oportunidades:					
	Impacto en Resultados (en miles €) de:					
	Riesgos físicos:					
	Riesgos de transición:					
	Oportunidades:					
Q19 b)	**¿Ha cuantificado su entidad el impacto financiero futuro estimado en la Cuenta de Resultados y en el Balance derivado de los riesgos y oportunidades relacionados con el cambio climático, incluyendo, en su caso, los vinculados a los distintos escenarios considerados?** En caso de ser material cuantificar:	**No se ha cuantificado**				
	Impacto en Patrimonio neto (en miles €) de:					
	Riesgos físicos:					
	Riesgos de transición:					
	Oportunidades:					
	Impacto en Resultados (en miles €) de:					
	Riesgos físicos:					
	Riesgos de transición:					
	Oportunidades:					
C19	**Observaciones:** *Las recomendaciones del Task force on Climate-related Financial Disclosures (TCFD) facilitan ejemplos de posibles impactos financieros (vía ingresos, gastos, valor de los activos y pasivos y capital y financiación) derivados de riesgos y oportunidades relacionados con el clima, animando a las organizaciones a realizar tanto análisis históricos como futuros de los mismos, enfocándose sobre todo en los análisis a futuro, al no contar los esfuerzos por mitigar y adaptarse al cambio climático con precedentes históricos. Algunos de los ejemplos de impactos citados en el documento son el incremento de costes derivado del aumento de las primas de seguro, multas y sentencias, el deterioro y retiro anticipado de activos debido a cambios en las políticas, la existencia de gastos en I+D de nuevas tecnologías, la reducción de la demanda de bienes y servicios por cambios en las preferencias del consumidor, etc.*	**Comentarios:**				
Q20	**¿Cuenta su entidad con procedimientos destinados a gestionar los riesgos y oportunidades relacionados con el cambio climático?**	**a de las respuestas anteriores (explicar en comen**				
C20	**Observaciones:** *El Suplemento del clima considera importante describir los procedimientos para gestionar los riesgos relacionados con el clima (si procede, la manera en que se adoptan las decisiones de mitigar, transferir, aceptar o controlar dichos riesgos) y cómo está gestionando la empresa los riesgos específicos relacionados con el clima que ha identificado.*	**Comentarios:**				
Q21	**¿Ha integrado la sociedad los procedimientos para identificar, evaluar y gestionar los riesgos relacionados con el clima dentro de la gestión del riesgo de la entidad?**	**N/A**				
C21	**Observaciones:** *El Suplemento del clima considera relevante describir cómo se integran en la gestión global de riesgos de la empresa los procesos de determinación, evaluación y gestión de los riesgos relacionados con el clima. Además señala que, un aspecto importante de esta descripción es la forma en que la empresa determina la importancia relativa de los riesgos relacionados con el clima frente a otros riesgos.*	**Comentarios:**				
	MÉTRICAS Y OBJETIVOS					
Q22	**CUMPLIMENTEN LA PESTAÑA "MÉTRICAS" CON AQUELLAS EMPLEADAS POR LA SOCIEDAD EN LA EVALUACIÓN DE RIESGOS Y OPORTUNIDADES RELACIONADAS CON EL**					
Q23	**Faciliten, en su caso, el porcentaje de las actividades de la entidad cubiertas por las emisiones reportadas para el ejercicio 2021:**	%				
		2017	**2018**	**2019**	**2020**	**2021**
	Alcance 1					
	Alcance 2					
	Alcance 3					
C23	**Observaciones**: *Describan cuáles son y a qué se han debido las exclusiones (ej. instalaciones, actividades, países, sociedades dependientes, gases específicos etc.) describiendo cómo cómo se ha realizado el cálculo para obtener el % excluido. En el caso del Alcance 3 dicho porcentaje deberá considerar las actividades corriente arriba y corriente abajo cubiertas en las emisiones reportadas.*	**Comentarios:**				
Q24	**Indiquen, en su caso, el porcentaje de emisiones correspondientes al ejercicio 2021 obtenidas mediante estimación:**	%				
		2017	**2018**	**2019**	**2020**	**2021**
	Alcance 1					
	Alcance 2					
	Alcance 3					
C24	**Observaciones:** *El Suplemento del Clima establece que, en el caso de emplear estimaciones en el cálculo de las emisiones por carecer de datos fiables, deberá indicarse el porcentaje de emisiones obtenidas mediante estimación, las razones por las cuáles no se han podido recopilar datos fiables sobre una proporción de las emisiones y el método empleado para estimar el porcentaje de emisiones sobre el que no se dispone de datos fiables.*	**Comentarios:**				
Q25	**¿Ha sometido su entidad a verificación/certificación el dato correspondiente a las emisiones de CO_2 correspondientes al ejercicio 2021 por parte de un prestador independiente de servicios de verificación?**	**N/A**				
C25	**Observaciones:** *La Ley 11/2018 indica que la información incluida en el estado de información no financiera (EINF) será verificada por un prestador independiente de servicios de verificación . En esta pregunta NO nos referimos al informe de verificación del EINF en su conjunto sino a una verificación específica de las emisiones GEI facilitadas en el periodo.* *Describan en Comentarios: (i) el nombre del verificador, la normativa bajo la que ha realizado el trabajo de verificación, así como cualquier otra información relevante y (ii) las posibles exclusiones consideradas por el verificador en su informe (ej. solo alcance 1 y 2 solo determinadas instalaciones o solo algunos gases) , tratando de facilitar una medida de lo excluido (por ejemplo, % sobre el total de emisiones, sobre las ventas del grupo etc.)*	**Comentarios:**				
Q26	**¿Están los objetivos climáticos de su entidad en consonancia con los objetivos fijados en el Acuerdo de París? Justifiquen su respuesta en comentarios, junto con una breve descripción de las medidas actuales y futuras para alcanzar estos objetivos y el calendario estimado para su cumplimiento.**	**N/A**				
C26	**Observaciones:** *El triple objetivo del Acuerdo de París implica limitar el aumento medio de la temperatura global a 2 grados centígrados respecto a los niveles preindustriales, redoblar esfuerzos para no superar la cota de 1,5 grados a final de este siglo y alcanzar la neutralidad climática en 2050. En 2018, el Panel Intergubernamental sobre el Cambio Climático (IPCC) advirtió que el calentamiento global no debe superar los 1,5 ºC respecto a las temperaturas preindustriales para evitar impactos catastróficos del cambio climático. Para lograr esto, las emisiones de gases de efecto invernadero (GEI) deben reducirse a la mitad para 2030 y caer a cero neto para 2050.*	**Comentarios:**				
Q27	**Indiquen si los objetivos de su entidad detallados en la pestaña MÉTRICAS son "objetivos basados en la ciencia" o "science-target based" (SBTs).** En caso afirmativo describan en el apartado de Comentarios cuáles de ellos son SBT, indicando en qué plazo/s y para qué escenario/s han sido validados.	**No son objetivos STB**				
C27	**Observaciones:** *Los objetivos adoptados por las empresas para reducir los gases de efecto invernadero (GEI) se consideran "con base científica" (STB science-target based) si se alinean con el nivel de decarbonización requerido para limitar el aumento de la temperatura global por debajo de 2 ºC en comparación con las temperaturas preindustriales, según se describe en el 5º Informe de Evaluación del Panel Intergubernamental sobre el Cambio Climático (IPCC AR5). Es decir, si están en línea con lo que la ciencia climática más reciente considera necesario para cumplir con los objetivos del Acuerdo de París.* *Para fijar objetivos basados en la ciencia las empresas deben seguir el procedimiento descrito en https://sciencebasedtargets.org/ que conlleva, entre otras cuestiones, la comunicación de su intención de establecer un objetivo SBT, presentar su objetivo al SBTi para la validación oficial, informar de sus emisiones y realizar un seguimiento del progreso de los objetivos con carácter anual.*	**Comentarios:**				
Q28	**¿Han sido verificados/validados/certificados sus objetivos climáticos por un tercero respecto a la trayectoria de descarbonización de 2 ºC o algún otro escenario ?** (a parte de lo indicado en Q27 relativo al SBTi)	**No han sido verificados**				
C28	**Observaciones:** *Incluir en Comentarios: nombre del verificador, detalle de los objetivos concretos que han sido validados (en términos absolutos, de intensidad), a qué plazo, escenario respecto al que se ha validado, normativa bajo la que ha realizado el validador su trabajo y cualquier otra información relevante*	**Comentarios:**				
Q29	**¿Ha establecido su empresa objetivos climáticos consistentes con sus inversiones de capital (capex)?** En caso de respuesta afirmativa describan en Comentarios los objetivos establecidos y para qué plazos han sido fijados.	**No se han fijado objetivos en línea con el CAPEX**				
C29	**Observaciones:**	**Comentarios:**				

Q22	CUMPLIMENTEN LOS DATOS CORRESPONDIENTES A LAS MÉTRICAS EMPLEADAS POR SU ENTIDAD, JUNTO CON LOS OBJETIVOS FIJADOS PARA CADA UNA DE LAS CITADAS MÉTRICAS EN EL CORTO, MEDIO Y LARGO PLAZO

			EMISIONES REALES					OBJETIVOS FUTUROS (expresado en % indicando año base en comentarios)																																	
Q22-1	Emisiones absolutas de Gases de efecto invernadero (GEI)	Unidad	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
	ALCANCE 1																																			
	Emisiones directas por fuentes propias o controladas por la compañía	t Co2 eq.																																		
	Objetivo fijado	t Co2 eq.																																		
	Desviación emisiones reales vs objetivos:	%	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!																													
	ALCANCE 2																																			
	Emisiones directas por fuentes propias o controladas por la compañía	t Co2 eq.																																		
	Objetivo fijado	t Co2 eq.																																		
	Desviación emisiones reales vs objetivos:	%	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!																													
	ALCANCE 3																																			
	Emisiones directas por fuentes propias o controladas por la compañía	t Co2 eq.																																		
	Objetivo fijado	t Co2 eq.																																		
	Desviación emisiones reales vs objetivos:	%	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!																													
	COMPENSACIÓN DE EMISIONES	t Co2 eq.																																		

Observaciones:	Comentarios:
Detallen en el apartado de "Comentarios" los estándares, metodologías, suposiciones y herramientas empleadas para el cálculo de las emisiones (incluyendo la fuente correspondiente a los factores de emisión y las tasas del potencial de calentamiento global o PCG para cada alcance). En caso de disponer de la información, faciliten el: (i) detalle de los gases incluidos en el cálculo de las emisiones (CO2, CH4, N2O, HFC, PFC, SF6, NF3) y (ii) % de las emisiones correspondientes al gas metano (CH4) y sus objetivos de reducción. El GRI 305-5 aborda el desglose de las reducciones de emisiones de GEI, indicando que se debe informar de las reducciones derivadas de las compensaciones por separado.	

			EMISIONES REALES					OBJETIVOS FUTUROS (expresado en % indicando año base en comentarios)																																	
Q22-2	Intensidad de las emisiones - indiquen el parámetro(s) y su unidad de medida empleado(s) para calcular el ratio de intensidad de emisiones de GEI (denominador)	Unidad	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
	- Parámetro 1	xxx																																		
	- Parámetro 2	xxx																																		
	- Parámetro 3 (etc)	xxx																																		
	ALCANCE 1																																			
	Emisiones directas por fuentes propias o controladas por la compañía	t Co2 eq./xxx																																		
	Objetivo fijado	t Co2 eq./xxx																																		
	Desviación emisiones reales vs objetivos:	%	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!																													
	ALCANCE 2																																			
	Emisiones directas por fuentes propias o controladas por la compañía	t Co2 eq./xxx																																		
	Objetivo fijado	t Co2 eq./xxx																																		
	Desviación emisiones reales vs objetivos:	%	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!																													
	ALCANCE 3	t Co2 eq./xxx																																		
	Emisiones directas por fuentes propias o controladas por la compañía	t Co2 eq./xxx																																		
	Objetivo fijado	t Co2 eq./xxx																																		
	Desviación emisiones reales vs objetivos:	%	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!	#¡DIV/0!																													
	COMPENSACIÓN DE EMISIONES	t Co2 eq./xxx																																		

Observaciones:	Comentarios:
Detallen en el apartado de "Comentarios" los estándares, metodologías, suposiciones y herramientas empleadas para el cálculo de las emisiones (incluyendo la fuente correspondiente a los factores de emisión y las tasas del potencial de calentamiento global o PCG para cada alcance). En caso de disponer de la información, faciliten el: (i) detalle de los gases incluidos en el cálculo de las emisiones (CO2, CH4, N2O, HFC, PFC, SF6, NF3) y (ii) % de las emisiones correspondientes al gas metano (CH4) y sus objetivos de reducción. El GRI 305-5 aborda el desglose de las reducciones de emisiones de GEI, indicando que se debe informar de las reducciones derivadas de las compensaciones por separado.	

Annex IV Questions and answers to the questionnaire on climate change. Construction of the index

Each of the responses considered was assigned a value according to the following list:

q11	respuesta_1	Sí, se han identificado riesgos del cambio climático sobre las actividades	4
q11	respuesta_2	Sí, se han identificado los riesgos de sus actividades sobre el cambio climático	5
q11	respuesta_3	Sí, se han identificado ambos tipos de riesgos	6
q11	respuesta_4	No se ha llevado a cabo esta labor de análisis	2
q11	respuesta_5	No se ha identificado ningún tipo de riesgos	3
q11	respuesta_6	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q12	respuesta_1	Sí, se han identificado oportunidades relacionadas con el cambio climático	4
q12	respuesta_2	No se han identificado oportunidades relacionadas con el cambio climático	3
q12	respuesta_3	No se ha llevado a cabo esta labor de análisis	2
q12	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q13	respuesta_1	Sí se han identificado diferentes horizontes (marcar con X)	2
q13	respuesta_2	No se han identificado diferentes horizontes temporales	1
q14	respuesta_1	Sí se han identificado riesgos físicos	4
q14	respuesta_2	Sí se han identificado riesgos de transición	3
q14	respuesta_3	Sí se han identificado ambos tipos de riesgos	5
q14	respuesta_4	No se ha llevado a cabo esta labor de análisis	2
q14	respuesta_5	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q15	respuesta_1	No se ha desarrollado	2
q15	respuesta_2	Se ha desarrollado pero aún no se ha implementado	3
q15	respuesta_3	Se ha desarrollado e implementado	4
q15	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q16a	respuesta_1	Si, se ha establecido un precio interno de CO2	4
q16a	respuesta_2	La entidad está en proceso de establecer un precio interno de CO2	3
q16a	respuesta_3	No se ha establecido un precio interno de CO2	2
q16a	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q16b	respuesta_1	Si, dispone de activos cuyas emisiones sobrepasan los derechos asignados	3
q16b	respuesta_2	No dispone de activos cuyas emisiones sobrepasen los derechos asignados	2
q16b	respuesta_3	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q16c	respuesta_1	Sí realiza proyecciones a futuro considerando posibles escenarios	3
q16c	respuesta_2	No realiza proyecciones a futuro considerando posibles escenarios	2
q16c	respuesta_3	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q17	respuesta_1	Sí, se ha considerado el impacto del clima sobre NEP	3
q17	respuesta_2	Sí, se ha considerado el impacto del NEP sobre el clima	4
q17	respuesta_3	Sí, se ha considerado ambos impactos	5
q17	respuesta_4	No se ha considerado ningún impacto	2
q17	respuesta_5	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q18	respuesta_1	Sí, se ha considerado diversos escenarios (explicar en comentarios)	3
q18	respuesta_2	No se han considerados diversos escenarios	2
q18	respuesta_3	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q19a	respuesta_1	Sí, se ha cuantificado y no es material	3
q19a	respuesta_2	Sí, se ha cuantificado y es material	4
q19a	respuesta_3	La entidad está en proceso de realizar dicha evaluación	2
q19a	respuesta_4	No se ha cuantificado	1
q19b	respuesta_1	Sí, se ha cuantificado y no es material	3
q19b	respuesta_2	Sí, se ha cuantificado y es material	4
q19b	respuesta_3	La entidad está en proceso de realizar dicha evaluación	2
q19b	respuesta_4	No se ha cuantificado	1

num_preg	num_resp	respuesta	indice
q20	respuesta_1	Existen procedimientos específicos (facilitar breve descripción)	4
q20	respuesta_2	Los procedimientos se encuentran actualmente en desarrollo	3
q20	respuesta_3	No existen procedimientos específicos	2
q20	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q21	respuesta_1	Sí, se han integrado en la gestión de riesgos	4
q21	respuesta_2	No se han integrado en la gestión de riesgos	2
q21	respuesta_3	Pendiente de integración en la actualidad	3
q21	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q1	respuesta_1	Existen políticas específicas sobre clima	4
q1	respuesta_2	Existen procedimientos específicos sobre clima	3
q1	respuesta_3	Existen políticas y procedimientos específicos sobre clima	5
q1	respuesta_4	Las políticas/procedimientos se encuentran actualmente en desarrollo	2
q1	respuesta_5	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q2	respuesta_1	Sí, han sido aprobadas por el Consejo de Administración	5
q2	respuesta_2	No han sido aprobadas por el Consejo de Administración	2
q2	respuesta_3	Están en proceso de ser aprobadas por el Consejo de Administración	4
q2	respuesta_4	Han sido aprobadas por otro órgano social (especificar en comentarios)	3
q2	respuesta_5	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q3a	respuesta_1	Sí, ejerce dicha labor	4
q3a	respuesta_2	No está entre sus funciones	1
q3a	respuesta_3	Dicha labor es ejercida por otro órgano social (especificar en comentarios)	3
q3a	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	2
q3b	respuesta_1	Sí, ejerce dicha labor	4
q3b	respuesta_2	No está entre sus funciones	1
q3b	respuesta_3	Dicha labor es ejercida por otro órgano social (especificar en comentarios)	3
q3b	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	2
q5	respuesta_1	Sí, ejerce dicha labor	4
q5	respuesta_2	No está entre sus funciones	1
q5	respuesta_3	Dicha labor es ejercida por otro órgano social (especificar en comentarios)	3
q5	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	2
q6	respuesta_1	Sí, existe un organismo con funciones específicas relativas al clima	2
q6	respuesta_2	No existe organismo concreto con funciones relativas al clima	1
q7	respuesta_1	Consejero Delegado	4
q7	respuesta_2	Un miembro del Consejo de Administración (indicar quién/es)	3
q7	respuesta_3	Un órganismo en concreto (indicar cuál en comentarios)	2
q7	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q8	respuesta_1	Sí, a través de su propia capacidad interna	2
q8	respuesta_2	Sí,a través de de fuentes externas	3
q8	respuesta_3	Sí, tanto a través de fuentes internas como externas	4
q8	respuesta_4	No dispone de acceso a conocimientos especializados sobre clima	1
q9	respuesta_1	Sí, para todos/algunos miembros del Consejo Admón	5
q9	respuesta_2	Sí, para todos/algunos directivos	4
q9	respuesta_3	Sí, para todos/algunos miembros del Consejo Admón y directivos	7
q9	respuesta_4	Sí, para algunos trabajadores	3
q9	respuesta_5	Sí, para algunos trabajadores y directivos	6
q9	respuesta_6	Sí, para algunos trabajadores, directivos y miembros del Consejo de Admón	8
q9	respuesta_7	No existe	1
q9	respuesta_8	Actualmente en desarrollo	2
q10	respuesta_1	Existen procedimientos específicos (facilitar breve descripción)	4
q10	respuesta_2	Los procedimientos se encuentran actualmente en desarrollo	3
q10	respuesta_3	No existen procedimientos específicos	2
q10	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1

num_preg	num_resp	respuesta	indice
q25	respuesta_1	Si, en el marco de la verificacion del EINF tomado en su conjunto	5
q25	respuesta_2	Si, revisión específica con alcance de seguridad limitada	3
q25	respuesta_3	Si, revisión específica con alcance de aseguramiento razonable	4
q25	respuesta_4	Si, otro tipo de revisión (especificar en Comentarios)	2
q25	respuesta_5	No	1
q26	respuesta_1	Sí, están en consonancia (detallar escenario)	4
q26	respuesta_2	En proceso de alinearse con dichos objetivos	3
q26	respuesta_3	No están alineados	2
q26	respuesta_4	Ninguna de las respuestas anteriores (explicar en comentarios)	1
q27	respuesta_1	Si son objetivos STB	3
q27	respuesta_2	No, pero estamos en proceso "compromiso" (explicar en comentarios)	2
q27	respuesta_3	No son objetivos STB	1
q28	respuesta_1	Si han sido verificados/certificados/validados	3
q28	respuesta_2	No, pero estamos en proceso (explicar en comentarios)	2
q28	respuesta_3	No han sido verificados	1
q29	respuesta_1	Si, se han fijado objetivos en linea con el CAPEX	2
q29	respuesta_2	No se han fijado objetivos en linea con el CAPEX	1

Answers with “N/A” (not available) were assigned zero.

To build the index, the following formula was used:

$$Climate\ change\ index_j = \frac{\sum_{i=q_1}^{q_{29}} \frac{answer_i}{max\ (answer_i)}}{N}\ x\ 100$$

For each of the issuers that responded to the questionnaire, j = 1,...,41 and for each question the specific value of the answer was weighted by the maximum value assigned to the possible answers. Once the weighted value of all the answers had been calculated, a simple average of these was made, and multiplied by 100. No. is the number of responses considered.