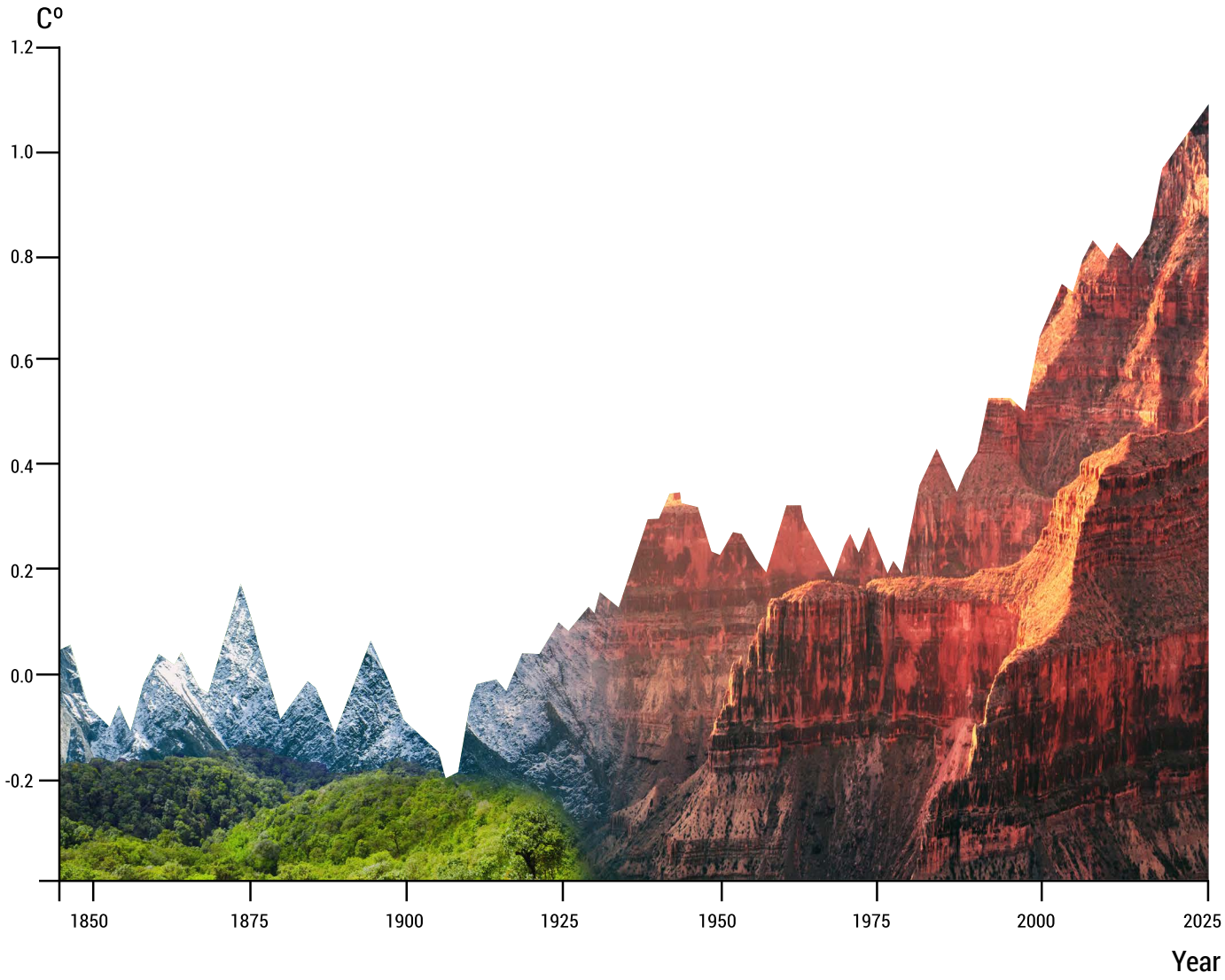
spainsif

Study

Investment and climate change



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SUST4IN

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SUMMARY

FOREWORD

Mr. Hugo Morán

Secretary of State for Environment

The health crisis of COVID-19 has put into black and white an evidence that was already known but had not been acted on: the current model of unsustainable development carries significant risks to economies and people's health.

We have to learn the lesson and react accordingly. It is urgent to face current challenges with an eye on our future. The prosperity of our economies and societies is closely linked to the preservation of the environment and the fight against climate change. We must restore balance with natural ecosystems in order to build resilient societies and economies, capable of avoiding further shocks and preparing for future risks.

In this context, the economic recovery from the pandemic provides a historic opportunity to lay the foundations for a sustainable and inclusive future that takes into account the limits of the planet, tackles climate change and puts people at the centre. The unprecedented resources that are being mobilized to aid reconstruction open the door for countries to anticipate our economic transformation efforts, many of which were already planned. Renewable energies and energy efficiency, sustainable mobility, electrification, adaptation to the impacts of climate change, are examples of some of the areas with the greatest potential for economic growth and employment generation.

Investment needs are immense, and the role of the private sector will be fundamental to accompany governments in mobilizing the necessary resources to advance an economic recovery that is sustainable and meets climate objectives. A private sector that has demonstrated its interest in participating in this process of change, taking important steps with commitments to align its investment decisions with the decarbonization and resilience objectives of the Paris Agreement.

In Spain, we are not going to let this situation pass by without making the most of it, contributing in the right direction. Thus, the Government of Spain already has an accurate framework that will allow the deployment ok levers to successfully combine current opportunities, anticipate new demands and generate new industries and competitive value chains, generating employment and social justice. This Framework, made up of the draft Law on Climate Change and Energy Transition, the National Integrated Energy and Climate Plan, the Just Transition

Strategy and the National Plan for Adaptation to Climate Change, lays the foundations for a process of transformation of the Spanish economy towards climate neutrality in 2050 with which it seeks to build a resilient and future-ready country that leaves no one behind and opens the door to making the most out of European resources for reconstruction.

This bet is made with the conviction that "green" projects, compatible with the fight against climate change, create more employment opportunities, generate more short-term benefits for each euro invested and provide greater long-term savings than traditional measures of fiscal stimulus. The time has come to take action, without delay, and we all have our space to act. A space of well-being and opportunities in which the needs of present and future generations are finally reconciled.

Ms. Margarita Delgado

Deputy Governor of the Bank of Spain

It is a fact that the concerns about the origin and consequences of climate change has long surpassed the walls of scientific research and government cabinets to settle on the agenda of the boards of directors and even in the day-to-day of households. The world of finance, as the transmission axis of the economy, has not been immune to this transformation.

If we take a look at the daily press, we can see that the terms 'green bonds' or 'sustainable finance' are increasingly present in articles and financial analysis. In fact, the incorporation of responsible investment principles, which seek the application of the so-called 'environmental, social and governance' criteria to asset selection and management processes, is a growing reality among managers and financial institutions around the world.

The incorporation of sustainability into financial decision-making is undoubtedly a positive development that responds to growing awareness, as well as the enormous volume of economic resources that will be required to successfully carry out the compromised energy transition, whose regulations are close to be approved in Spain.

It can be admitted that, although the involvement of the financial sector in this collective challenge has been relatively modest until recently, its role today as a facilitator of this transformation is key, as stated in the 2015 Paris Agreement itself or as indicated shortly afterwards by Mark Carney, then Governor of the Bank of England, in his now famous allusion to the "tragedy of the horizon": if the financial sector does not react now to the future risks posed by climate change, when they materialize, it can be too late.

Concerning central banking and supervision, I think it is fair to admit that until recently we viewed the fight against climate change as outside our mandate. This perception is being changed with the evolution of the analysis of the implications and opportunities brought by the compliance with the Paris Agreement can bring to the financial sector and the economy as a whole.

Certainly, the creation of the Network for Greening the Financial System (NGFS) at the end of 2017 has marked a turning point in our level of

involvement. The growing importance of sustainability in international forums and institutions, as well as the exponential growth in membership of the NGFS, shows that this is a topic that is here to stay.

Definitely, the financial sector plays a fundamental role in this challenge, both because of its exposure to risks arising from the environmental transition, and because of its fundamental work as a channel for necessary investments to transform our economy towards a sustainable model.

It is fair to point out that there are entities and investors that have been applying these criteria for a long time, as the history of green bonds shows. In this sense, I cannot stop congratulating Spainsif for more than 10 years promoting responsible investment, fostering and raising awareness among all stakeholders, having become a reference in our country.

Undoubtedly, when Spainsif issued its first report in the midst of the international financial crisis, back in 2009, responsible investment was not among the priorities of most economic agents and financial institutions. Nowadays, as then, the harsh economic circumstances in the aftermath of the COVID-19 pandemic crisis lead some agents to point out that promoting these considerations is not a priority.

I believe, however, that if we have learned something after both crises, it is that what constitutes a mistake in the medium and long term is to ignore the importance of sustainability precisely. In fact, the main international managers seem to be reaching this same conclusion, whose management strategy increasingly involves 'turning on the high beams', in order to evaluate the profitability and soundness of any investment from the perspective of the long term.

In this process of adaptation to the future, where the new regulation and technological progress will set a very demanding rhythm of adaptation, this report provides a roadmap so as not to lose the reference of the entire path travelled, showing how much progress has been made in this last decade, but also how much remains to be done.

Being aware of the difficulties that this challenge implies, I do not want to end without highlighting two aspects that seem very positive to me: on the one hand, the speed at which these changes are taking place; on the other, the implication that the private sector is showing throughout this process, including, of course, the banking sector itself. We need unity to meet this challenge, so we must congratulate ourselves on that.

LETTER FROM THE PRESIDENT AND THE DIRECTOR

Joaquín Garralda

President

Fco. Javier Garayoa

Director

As a result of our presence at the UN Conference on Climate Change, COP 25, held in December 2019 in Madrid, and the call to the public and private sector to give an effective response to the state of "climate emergency", we understood, as Spainsif, that the first step was to know what was the current state of the drivers that influence investment with sustainability criteria – environmental, social and governance, ESG for short - as a consequence of the responses from different groups and organizations, referring to the climate change in Spain.

This report aims to provide this baseline information, considering: the global panorama of climate investments; the different scenarios; investment needs; and the specific case of Spain. The different private investment vehicles that allow the sustainable investor to have the option of their demand are highlighted; without forgetting the legal framework and the public policies that have been put in place. Regulators and supervisors have played a very relevant role in the strong growth of ESG investment in Europe and Spain in recent years.

In order to provide this report with a practical and global scope, a chapter on risks and another on opportunities derived from the energy transition process has been included. Without forgetting the implications of also pursuing a just transition – which contributes to the social dimension – an aspect for which we dedicate a whole chapter.

We want to make a special emphasis, due to its relevance, of the new regulatory framework that the European Commission is developing. Its main objective is to facilitate the development of a green investment market, which is aligned with the commitments reached at COP 21 in Paris and strengthened by the European Green Deal of December 2019. This agreement reinforces the European commitment with the energy transition, including more ambitious goals, allocating public resources (presumably more than 25% of EU budget), and giving a relevant role to the private sector as a channel and promoter in the achievement of the objectives.

We cannot finish this report without providing a specific section on the impact that COVID 19 has had on society and the economy, reflected in the initiatives on "new normal and green reconstruction". In this line of adding the social emergency to the climate one, the recent "EU

Next Generation", 2020, is identified, which bases the post-COVID European reconstruction on an emissions-neutral environmental model.

As final contributions, we did not want to stay only in the analysis of the existing information and we have asked the author to incorporate his recommendations, with the focus placed on accelerating investment in climate action. We hope they will be useful for those who are direct and indirect actors in this whole process.

As on previous occasions, we would like to thank those who have provided the information that has served as the basis for this report, especially those associated and related to sustainable investment, and, of course, the research team that has prepared it.

SPAINSIF MEMBERS

EXECUTIVE SUMMARY

Facing the challenge of climate change, the financial sector offers great **investment opportunities** both in mitigation, aimed at reducing emissions, and in adaptation, minimizing the effects that increased temperatures will have on ecosystems and the economy, including in Spain, the focus of this report.

This research aims to collect information on the presence of climate change in finance, through a **bibliographic** review, as well as to identify the participation of the different agents involved and which are active in the Spanish market, based on the answers they have provided to the **questionnaire** and the **interviews** carried out.

The **global outlook** regarding climate change is **concerning**, as climate is unequivocally warming, and greenhouse gas (GHG) emissions continue to rise. In response to these concerns, the financial sector has been responding with the supply of **new investment vehicles**, such as sustainable bonds, green bonds, green loans and others. In this sense, institutional investors and asset managers are gaining more and more prominence. On the other hand, regulators maintain their importance, and **new legal frameworks** emerge, as well as public policies, especially in Europe, that seek to stimulate the transition to a low-carbon economy.

Regarding the **risks** for the financial sector, the so-called **transition risks** are the most important ones, especially market risks and risks derived from public policies. In addition to these risks, investors are also concerned about chronic **physical risks**, such as rising temperatures or the scarcity of resources.

In terms of investment **opportunities**, there are plenty, both in adaptation and mitigation, in which the **renewable energy** sector stands out, especially solar energy, together with **energy efficiency**. Although there is a lack of experience and knowledge in the market, the main driver for investment growth is a **growing demand**, followed by **regulatory developments**.

Based on the responses received, these are the **key findings** from this study:

- **There is a growing trend in the importance of climate in investment portfolios**: according to respondents, portfolios with a high proportion (> 60%) of climate investments should rise rapidly in the next 3 years, from 9% to 25% and then to 27% in the next 10 years.
- Regarding financial instruments, **sustainable bonds and green bonds are perceived as the most important instruments in the next 3 years**, respectively by 76% and 62% of respondents and by 71% and 64%, respectively, in the next 10 years.
- **Better regulation would be the main action to accelerate the growth of climate investments in Spain** for 87% of those surveyed.
- 78% of respondents understand that **institutional investors are one of the main actors behind the growth of climate investment**.

- **Transition risks**: market (55%), public policies (53%) and, to a lesser extent, reputational risks (45%), are the risks perceived as most important for the financial sector among respondents.
- There is a clear perception that the **oil (81%) and coal (70%) sectors will be the sectors most negatively affected by climate risks**.
- On the other hand, it is not surprising that **the solar energy sector is clearly the big bet of current investments** with 61% of those surveyed indicating that it is one of the most important sectors, followed by energy efficiency (43%) and transportation low carbon (41%).
- The three **obstacles** indicated as the most important for investment in adaptation and mitigation are **inexperience and/or lack of knowledge in the market** (63% and 57%, respectively), **lack of global standards** (50% and 46%) and **lack of reliable information** (41% and 37%).
- The most important existing **driver** for investment in adaptation and mitigation is undoubtedly **growing demand** (69% and 87%, respectively) followed by regulatory developments (51% and 58%).
- **Support for R&D** (65%) **is the action understood as the one that can contribute most significantly to the just transition in Spain**. Other actions provided for in the draft bill on climate change and energy transition and highlighted in the survey would be fiscal measures (52%) and job creation measures (50%).
- For the current situation, it is clear that the **European Directive on Disclosure of Non-Financial and Diversity Information**, transposed in Spain by Law 11/2018, is the instrument most adopted (53%) and implemented (56%), although the European taxonomy should become more important in the next 3 years for 38% of those surveyed.
- The most striking result of the survey has been the **extraordinary optimism about the new European legal framework**, especially the new taxonomy for sustainable activities: 86% of the respondents believe that new taxonomy will have important effects on the increase in both the supply and demand of climate related finance.
- Finally, and also with great optimism, **two-thirds (66%) of those surveyed believe that there will be an increase in climate financing as a consequence of the COVID-19 crisis**, either due to the widespread growth of sustainable financing (41%) or thanks to green economic stimulus plans (25%).

This final report includes several recommendations throughout the text, of which six general recommendations, directed at different stakeholders, stand out as to:

- Approve and stabilize **better, or smart regulation**.
- **Standardize** reporting and metrics.
- Improve **transparency**.
- Increase **awareness and training**.
- Establish the necessary mechanisms to guarantee a **just transition** and reinforce the presence of social and governance aspects in investments.
- Accelerate investments in **adaptation**.

1. INTRODUCTION

1.1. Objective

The objective of this report, commissioned by Spainsif, the Spanish Sustainable Investment Forum, is to provide **information and recommendations** on the lines of action that the financial sector, and the different actors involved in it, must follow in order to promote the transition towards a low carbon emissions economic model.

1.2. Methodology

For the preparation of this report, a widely referenced bibliographic review has been carried out, with links provided whenever the source is available in electronic format, at a European and international levels on the current panorama and new trends.

Then a survey has been conducted for 47 institutional investors, asset owners and providers of sustainable and responsible investment services (SRI) active in the Spanish market, as well as regulators, public administration, trade unions, non-governmental organizations (NGOs) and other actors related to SRI and climate action.

Finally, a series of individual interviews have been carried out with 14 experts representing: 3 asset managers, 3 financial/insurance entities, 3 non-profit organizations, 2 SRI service providers, 2 academic centres and a trade union confederation.

Results are **shown throughout this report** in parallel to the bibliographic review. The data collected from the survey is developed objectively through graphs preceded by the corresponding questions and indicating the number of responses obtained along with a brief interpretation of what has been perceived. The interviews are compiled throughout the text in the form of comments.

The report concludes with **recommendations** for the financial sector, but also for other stakeholders, in accordance with the objective defined at the beginning.

The **survey** has been answered by representatives of entities such as AFI Inversiones Globales, Alaluz Capital, Altermia, Analistas Financieros Internacionales, Banco de Sabadell, BBVA, Cecabank, CPPS, CCOO, EDM, Esade Entrepreneurship Institute, Fundación Ecología y Desarrollo - ECODES, Fundación ONCE, Groupama Asset Management, Ibercaja Pensión, ILUNION, Instituto de Crédito Oficial, Instituto de Hidráulica Ambiental, KPMG, Liberbank, Mazars Auditores, SLP, Micappital, Spanish Observatory of Finance, PwC, Spanish Network of the United Nations Global Compact, Santander Asset Management, Seguros RGA, Serfiex SA, Unión General de Trabajadores, Rovira i Virgili University, WWF Spain and 16 other respondents under anonymity.

Hereby we would like to thank to all the individuals and entities that have participated in the survey, interviews and, finally, the review of this report, especially the support provided by all the associate members, as well as the contributions of the related entities and institutions.

2. GLOBAL OVERVIEW OF CLIMATE INVESTMENT

2.1. Climate change, adaptation and mitigation

The main cause of climate change is the anthropogenic emissions of **greenhouse gases** (GHG) such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), hexafluoride sulphur (SF_6) or nitrogen trifluoride (NF_3).

Due to its volume and importance, carbon dioxide is the **reference unit**, CO_2 equivalent (CO2e), to calculate the global warming potential (Global Warming Potential, GWP) of the emissions of each GHG. The GWP can be calculated for periods of 20, 100 or 500 years, with 100 years being the most frequent value. Methane, for example, has a potential to trap heat 25 times greater than CO_2 at 100 years, therefore its GWP100 = 25. That is, the emission of 1 million tons of methane is equivalent to emitting 25 million tons of CO_2 (equivalent).

In 2015, the Paris Agreement[1], was signed, being the most important commitment in the world in the fight against climate change and ratified by 189 of the 197 signatory parties[2]. Although the agreement does not define the appropriate amount of these emissions, its main objective is "Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels", recognizing that this would significantly reduce the risks and impacts of climate change.

In 2018, the highest scientific authority on climate change, the Intergovernmental Panel on Climate Change (IPCC), reinforced its 2014 message on "**unequivocal warming of the climate**" and estimated that human activities had caused global warming of about 1.0 °C relative to pre-industrial levels. The special report "Global Warming of 1.5 °C" also warns that the warming caused by anthropogenic emissions from the pre-industrial period to the present will last from centuries to millennia and will continue to cause new long-term changes in the climate system, such as an increase of the sea level, accompanied by associated impacts such as the alteration of climatic regimes, desertification, acidification of the oceans, the increase in extreme meteorological events or the loss of biodiversity[3].

In its special report, the IPCC indicates that human activities have already caused global warming of approximately 1.0 °C compared to pre-industrial levels and that global warming will reach 1.5 °C between 2030 and 2052 if it continues to increase at the current rate[4].

The increase in the frequency of catastrophic weather events, such as hurricanes in the Caribbean or droughts or torrential rains in Spain, is also evident. The World Economic Forum (WEF), in its latest report on global risks (*The Global Risks Report 2020*)[5], classifies "failure in climate action" and "extreme weather" as the two risks with the greatest impacts and probabilities, above risks such as cyberattacks or wars.

The financial sector is already considering those risks. In 2015, the Governor of the Bank of England and President of the Financial Stability Board (FSB), Mark Carney, in his now historic speech "Breaking the

Tragedy of the Horizon - climate change and financial stability"[6] warned that "shifts in our climate bring potentially profound implications for insurers, financial stability and the economy".

In January 2020, Larry Fink, CEO of BlackRock, the world's largest fund manager, stated that "because of capital markets pulling future risk forward, we will see changes in capital allocation more quickly than we see changes in the climate itself[7].

In this context, in addition to **mitigation** actions, aimed at reducing the emission of greenhouse gases (GHG), and to "holding the increase in the global average temperature to well below 2 °C and pursuing efforts to limit it to 1,5 °C above pre-industrial levels", as laid down in the Paris Agreement[8], adaptation actions are necessary, defined as "the process of adjustment to actual and expected climate change and its impacts"[9].

2.2. Calculation, reporting, neutralization and verification of emissions

Quantifying and monitoring GHG emissions and then reducing or neutralizing them is essential in the fight against climate change, especially when many organizations and countries begin to define their strategies for net zero emissions or even negative emissions.

GHG emissions are calculated through **emission factors** calculated and defined by the IPCC or an official source. An emission factor is a "value that relates the quantity of a pollutant released with an activity associated with the release of that pollutant"[10].

Fuel (Unit EF)	Emission factor (EF, 2018)
Gasoline (kgCO2/l)	2.157
Diesel A (kgCO2/l)	2.493
Diesel B (kgCO2/l)	2.708
Diesel C (kgCO2/l)	2.868
Natural gas (kgCO2/kWh)	0.183
Butane gas (kgCO2/kg)	2.964
Propane gas (kgCO2/kg)	2.938
National coal (kgCO2/kg)	2.227
Imported coal (kgCO2/kg)	2.444

Table 1. *Emission of greenhouse gases (GHG) - examples of emissions of some fuels (Source: OECC)*[11]

In Spain, the Spanish Office for Climate Change (*Oficina Española de Cambio Climático, OECC*) publishes and updates emission factors with the amount of CO2 equivalent emitted for the consumption of each type of fuel, refrigerants or energy per operator[12].

On the previous page a table showing the emission factors (EF) of some fuels can be found.

Once the gases, the reference unit and the emission factors have been defined, it is important to establish the **scope** of the emission calculation, based on the responsibilities, financial control or operational control of the entity that calculates it, inside and outside its environment. The scope or **organization boundary** can be defined as *"grouping of activities or facilities in which an organization exercises operational or financial control or has an equity share"*[13].

When defining the boundary and reporting emissions, the following conventions are used, defined in the Greenhouse Gas Protocol (GHG Protocol[14]) published by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD):

- **Scope 1: Direct GHG emissions**

  Direct GHG emissions occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.

- **Scope 2: Electricity indirect GHG emissions**

  Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.

- **Scope 3: Other indirect GHG emissions**

  Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company that occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.

The most used references for **reporting** are the Global Reporting Initiative (GRI) standards, specifically the GRI 305 - Emissions standard, which standardizes the reporting of scopes 1, 2 and 3 emissions, in addition to the intensity of emissions (for production units or volume, size, revenue, sales, etc.) and the reduction of emissions[15].

Another option is to calculate and report the **carbon footprint** that, unlike the inventory or emissions calculation described above, should consider a life-cycle analysis and is normally applied to products, not organizations. According to ISO 14067, the carbon footprint of a product is the *"sum of GHG emissions and GHG removals in a product system, expressed as CO2equivalents and based on a life cycle assessment using the single impact category of climate change"*[16]. However, the phrase "carbon footprint" has become popular as a synonym for emissions in general and applied to organizations and products.

In respect of **neutralization** (or compensation) of emissions, there is no consensus for a definition. However, the ISO 14064-2 standard defines GHG removal: *"withdrawal of a GHG from the atmosphere by GHG sinks"*[17]. The neutralization of an organization's emissions normally occurs through investment in projects that avoid an equivalent volume of emissions, such as renewable energy or reforestation. The investment can be direct or indirect, through the purchase of carbon credits in regulated markets, such as the European Emissions Trading Scheme (EU ETS), or voluntary markets, such as the Voluntary Carbon Scheme (VCS).

Finally, the **verification** of the calculation, reporting and neutralizations is an increasingly common requirement of carbon trading schemes and investors. Verification can be defined as a *"systematic, independent, and documented process for the evaluation of a GHG assertion against agreed verification criteria"*[18].

In a debt issuance process, or even in the definition of sustainable investment frameworks, verification - of a different nature than the previous one, technically called "validation" - can also serve to validate the **credibility of the issuer** of a green bond, for example, ex ante, ensuring alignment with internal norms, standards or external green principles. And also, an ex post verification, to justify the **use of the funds (commonly referred as "use of proceeds")** raised in green investments or the climate impact of the new investments made.

In accordance with the Green Bond Principles, an issuer of a green bond, for example, can carry out an independent **verification** following a set of designated criteria, typically related to business processes and/or environmental criteria. Verification can focus on alignment with internal or external standards or statements made by the issuer. Furthermore, the assessment of the environmentally sustainable characteristics of the underlying assets may be called verification and may refer to external criteria. Assurance or certification of an issuer's internal tracking method of its income, allocation of funds from Green Bond proceeds, environmental impact statement, or alignment of reporting to GBP, may also be called verification[19].

2.3. Climate scenarios

According to the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), a **scenario** describes a path of development leading to a particular outcome[20]. **Scenario analysis** is one of the tools that organizations can use for a better understanding of their resilience.

The scenarios serve to explore alternatives that can significantly alter the "business as usual" assumptions. It is clear that while some organizations are starting to use scenario analysis to inform decision-making, the practice is still developing. Further development of data sets, tools, methodologies, and standards, as well as organizations sharing experiences, will help moving along practice and understanding of scenario analysis.

Based on this, at least three **climate scenarios** can be identified: 1.5 °C, 2 °C and "business as usual" (BAU), which the UN Environment Finance Initiative (UNEP FI) defines as 3 °C in its Guide for scenario-based methods for climate risk assessment[21].

It is important to understand that these scenarios are the result of political consensus, not scientific. Even in the lowest scenario, that one of 1.5ºC, the IPCC estimates that 70-90% of the corals would disappear. In the 2ºC scenario, for example, virtually all coral would disappear[22].

In its special report "Global warming of 1.5 °C", the IPCC indicates that human activities have already caused global warming of approximately 1.0 °C compared to pre-industrial levels and that global warming will reach 1.5 °C between 2030 and 2052 if it continues to increase at the current rate[23].

In Spain, the State Meteorological Agency (*Agencia Estatal de Meteorología*, AEMET) publishes and updates both numerical and graphical information on climate change projections for the 21st century regionalized for Spain and corresponding to different emission scenarios to be used, within the framework of the National Plan for Adaptation to Climate Change (*Plan Nacional de Adaptación al Cambio Climático*, PNACC), in impact and vulnerability assessment work[24].

2.4. Investment needs

Investment needs are high, but increasingly attractive, both in emission mitigation projects and in climate change adaptation projects.

The Global Commission on the Economy and Climate estimates that the transition to a low-carbon economy requires around $ 90 trillion of investment by 2030, which in turn creates new investment opportunities. On the other hand, robust climate action could generate a direct economic gain of $ 26 trillion through 2030 compared to the usual situation[25]. As Lord Stern explained in his well-known "Stern Review" in 2006, "the benefits of strong and early action far outweigh the economic costs of not acting"[26].

Current estimates suggest that climate change could cost the US economy as much as 10% of GDP by the end of the century and destabilize the world's food supply. According to IPCC estimates, GHG emissions at a level that offers a 66% probability of not exceeding 2ºC, would cost 3 to 11% of world GDP by 2100. Nevertheless, leaving global warming uncontrolled can cost from 23 to 74% of global GDP per capita by 2100 in lost agricultural production, health risks, floods and other major disruptions[27].

The financial sector is not immune to climate change. Since the 1980s, for example, the scale of climate-related insurance losses has increased fivefold to about $ 55 billion a year. The uninsured losses are twice as big. A recent exercise suggested that the insurance industry might still be underestimating potential losses from extreme weather conditions by as much as 50%[28].

2.5. The Principles for Responsible Investment (PRI)

The Principles for Responsible Investment (PRI) and its international network of more than 3,000 signatories, including 79 in Spain[29], is the oldest initiative and still one of the most significant ones for the promotion of responsible investment, therefore for climate investments as well. Together, PRI signatories manage more than $ 100 trillion in assets.

The PRI was started in 2006 by an international group of institutional investors in order to reflect the growing relevance of environmental, social and corporate governance issues in the context of investment

practices. In early 2005, the then-United Nations Secretary-General Kofi Annan invited a group of leading institutional investors from around the globe to join in a process to develop the PRI. A group of investors made up of 20 people from institutions from 12 countries was supported by a group of 70 experts from the investment sector, intergovernmental organizations and civil society[30].

The six principles and the signatories' commitment are to incorporate ESG issues into investment analysis and decision-making, and property policies and practices, as well as to seek disclosure of these by entities in which they invest. They are also responsible for promoting the acceptance and implementation of the Principles in the investment sector and for reporting on their activities and progress with respect to the application of the Principles[31].

2.6. The case of Spain

Due to its geographical position, Spain is one of the European countries most vulnerable to **physical risks**, especially water shortages, increased catastrophic floods and fires.

Since 2014, Spain has a pioneering system for the voluntary registration of **carbon footprint**, **compensation** and carbon dioxide **absorption projects**. When an organization is enrolled in the registry, it receives a certificate of registration and the right to use a label that identifies the level of participation of the organization in the Registry: calculation, reduction and/or compensation of all or part of its carbon footprint, in addition to the year to which this level of participation corresponds to[32]. However, the registry has a wide margin for growth: the proportion of emissions recorded in the registry compared to the total emissions in Spain is less than a third of the total, in addition to the fact that the volume registered has decreased in recent years and only a 39% of the registered emissions are **verified** by a third party[33] [34].

The draft of the Spanish Integrated Energy and Climate National Plan (*Plan Nacional Integrado de Energía y Clima*, PNIEC) 2021-2030 updated and published in January 2020, estimates a total investment needs of **€ 241 billion to achieve the objectives of the PNIEC between 2021 and 2030**. Of this amount, € 196 billion would be additional investments with respect to the Trend Scenario (without additional policies). The total investments would be distributed in:

- Savings and efficiency: 35% (€ 83.5 billion)
- Renewables: 38% (€ 91.8 billion)
- Networks and electrification: 24% (€ 58.6 billion)
- Other measures: 3% (€ 7.5 billion)[35]

Also according to the draft of the PNIEC of January 2020, a substantial part of the total investment should be made by the **private sector** (80% of the total), mainly associated with the deployment of renewables, distribution and transport networks, and a large part of the saving and efficiency measures. The rest will be carried out by the public sector in actions associated with the promotion of energy saving and efficiency, sustainable mobility and modal shift. In the case of public sector investments, a part would come from European funds.

Last and definitely not least, climate investment and Spain's response to **climate change must accelerate with the approval of the Climate Change and Energy Transition Law**, whose preliminary draft[36] is currently being discussed at the Spanish Parliament.

The draft contains 9 titles and 36 articles, including energy transition planning, renewable energies, fuels, mobility, adaptation measures, just transition measures, public and private resources, education and innovation, and governance. In accordance with Article 28, the private sector and the financial sector will have to publish **annual reports on the risks related to climate change**. Credit institutions will also have to publish specific decarbonization targets[37].

On the other hand, pursuant to article 29, the Bank of Spain, the National Securities Market Commission (*Comisión Nacional del Mercado de Valores*, CNMV) and the General Directorate of Insurance and Pension Funds (*Dirección General de Seguros y Fondos de Pensiones*, DGSFP) will have to publish, every two years, a joint report on the risk assessment for the Spanish financial system derived from climate change and policies to face it[38].

2.7. Private climate investment vehicles

The process of transition to a low-carbon economy presents new opportunities that have the potential to diversify portfolios and improve their resilience to the effects of climate change.

Many investors are already taking action to manage the risks and capture the opportunities that climate change presents by:

- reducing exposure to high-carbon assets;
- engaging with companies and policy makers;
- integrating climate change into investment strategies;
- undertaking scenario analysis;
- improving disclosure and transparency;
- allocating capital to new, low-carbon, climate-resilient opportunities[39].

Sustainable finance and the climate finance subgroup allow the use of different financing products that promote sustainable development and climate change mitigation and adaptation respectively:

- **Green and sustainable bonds**: public or private debt bonds focused on financing projects aimed at positive environmental or social impacts.
- **Pension and investment funds**: investment and savings instruments made up of the assets of a group of individual investors and whose management relies on a managing entity.
- **Green or social venture capital**: investments with sustainability criteria towards unlisted companies.
- **Microcredits**: small credits for entrepreneurship or business development with difficulty in accessing financing, whose objective is to promote the transition to a low-carbon economy.

Private access to climate investment opportunities can take place through:

- **primary financing** of new low-carbon/energy-efficient projects and/or assets:
  - investing in infrastructure or private equity funds;
  - direct project-level investment;
  - buying securitised bonds or equity;
  - investing in green buildings;
  - funding the balance sheets of corporate developers in both debt and equity;
- **secondary markets and vehicles**, such as low-carbon passive and active equity funds[40].

The two main categories of financial instruments in climate finance are equities and debt.

- In the early stages of a project, **equity financing** is the main investment method used, and investors receive an ownership interest (stocks or shares) of the project in exchange for the amount of equity they invest.
- In later stages of a project, **debt financing** becomes the predominant investment method. Investors lend money to borrowers and this money is repaid with interest.

Debt financing can take two forms: **loans** and **bonds**. A loan is a transfer of money from a bank to a company or individual, while a bond is a transfer of money from the public or the market to a company that issues the bond.

Specifically, the main debt financing instruments are:

- **Green bonds**: includes climate bonds and other bonds linked to environmental issues

  Green bonds, first issued in 2007 by the European Investment Bank (EIB), are *"any type of bond in which the funds will be applied exclusively to finance or refinance, in part or in full, eligible green projects, whether they are new and / or existing and that are aligned with the Green Bonds Principles (GBP)"*[41], they can therefore be issued by public or private entities. The European Commission already defines a green bond as *"any type of listed or unlisted bond or any other capital market debt instrument issued by a European or international issuer that is aligned with the European Union Green Bonds Standard, EU GBS"*[42].

  The indicative list of **green projects** defined by GBP includes the following project categories:

  - **renewable energy** (including production, transmission, appliances and products);
  - **energy efficiency** (such as in new and refurbished buildings, energy storage, district heating, smart grids, appliances and products);
  - **pollution prevention and control** (including reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, waste recycling and energy/ emission-efficient waste to energy);
  - **environmentally sustainable management of living natural resources and land use** (including environmentally sustainable agriculture; environmentally sustainable animal husbandry; climate smart farm inputs such as biological crop protection or drip-irrigation; environmentally sustain-

able fishery and aquaculture; environmentally-sustainable forestry, including afforestation or re-forestation, and preservation or restoration of natural landscapes);

- **terrestrial and aquatic biodiversity conservation** (including the protection of coastal, marine and watershed environments);
- **clean transportation** (such as electric, hybrid, public, rail, non-motorised, multi-modal transportation, infrastructure for clean energy vehicles and reduction of harmful emissions);
- **sustainable water and wastewater management** (including sustainable infrastructure for clean and/or drinking water, wastewater treatment, sustainable urban drainage systems and river training and other forms of flooding mitigation);
- **climate change adaptation** (including information support systems, such as climate observation and early warning systems);
- **eco-efficient and/or circular economy adapted** products, production technologies and processes (such as development and introduction of environmentally sustainable products, with an eco-label or environmental certification, resource-efficient packaging and distribution);
- **green buildings** which meet regional, national or internationally recognised standards or certifications[43].

According to the Climate Bonds Initiative, in 2019 there were 1,802 issues with a total volume of $ 259 billion in green bonds (2018: $ 171 billion)[44].

The growth and importance of green bonds - in addition to the ever-present concern with greenwashing[45] – has led the European Commission to launch in June 2019, within the framework of the EU Sustainable Finance Action Plan (2018), a proposal for a specific standard for this instrument, the European Green Bond Standard (EU GBS).

The new standard, developed by the Technical Expert Group (TEG), is a voluntary standard available to issuers who wish to align with best practices in the market. It is designed to be used and accessible by both EU issuers and issuers located outside the EU. It is based on the Green Bond Principles (GBP)[46].

In March 2020, the European Commission published a "Usability Guide to the EU Green Bond Standard" with recommendations from the TEG on the practical application of the EU GBS. The guide is intended to help prospective EU green bond issuers, verifiers and investors. It also provides guidance reflecting the latest changes to the draft EU GBS model[47].

- **Sustainable bonds**: include bonds linked to the Sustainable Development Goals or linked to sustainability in a broader sense.

According to the Sustainable Bond Guide of the International Capital Market Association (ICMA), sustainable bonds are those bonds where the funds will be applied exclusively to finance or refinance a combination of green projects and social projects. Sustainable bonds are aligned with the four main pillars of GBP and the Social Bonds Principles (SBP), the former being especially relevant for green projects and the latter for social projects[48].

Sustainability-linked bonds (SLBs) are defined by the ICMA, as "any type of bond instrument for which the financial and/or structural characteristics can vary depending on whether the issuer achieves predefined Sustainability/ ESG objectives. In that sense, issuers are thereby committing explicitly (including in the bond documentation) to future improvements in sustainability outcome(s) within a predefined timeline. SLBs are a forward-looking performance-based instrument"[49].

Unlike traditional sustainable bonds, which have to prove that the capital they raise is going to be used for specific sustainable projects, bonds linked to sustainability criteria are sustainable because they are issued with a structural component (for example, a coupon) that varies depending on the achievement or not of a specific objective that falls within a definition of ESG (Environmental, Social and Governance). Thus, although they are classified in the same universe as the now traditional use of green, social and sustainable bond use of proceeds, the main difference is the lack of dedicated income from ESG projects. The income of the bonds linked to sustainability criteria are issued for general corporate purposes[50].

- **Transition bonds**

  Transition Bonds have an identical definition to green bonds, except that they serve to finance "transition projects" towards a green economy instead of "green projects". Transition projects can include:

  Energy

  - Cogeneration plants
  - Carbon Capture Storage
  - Gas transportation infrastructure which can be switched to lower carbon intensity fuels
  - Coal-to-gas fuel switch in defined geographical areas, with defined carbon avoidance performance
  - Waste-to-energy

  Transportation

  - Gas powered ships
  - Aircraft alternative fuels

  Industry

  - Cement, metals or glass energy efficiency investments - such as to reduce clinker ratio, use of recycled raw materials, smelting reduction and higher recycling[51].

Transitional bonds are used by entities that cannot currently be considered "green" but are committed to a low-carbon economy. They are controversial, but their proponents argue that by being a new kind of instrument they help "clean up" green bonds and, more importantly, allow even "brown" companies - which cannot cease to exist - to start turning into "green".

- **Green loans**: They include bilateral loans, syndicated loans, and others.

According to the Green Loan Principles (GLP), also inspired by the Green Bond Principles, green loans are "any type of loan instrument made available exclusively to finance or re-finance, in whole or in part, new and/or existing eligible Green Projects. Green loans must align with the four core compo-

nents of the GLP"[52]. According to the GLP "green projects" would be the same as those previously defined for green bonds.

There are four main formats of green loan:

- **Green bilateral loan**, with a corporate guarantee formalized between the company and the bank.
- **Green syndicated loan**, where a group of several banks come to finance the operation with the figure of one of them as environmental agent bank (green agent), which is in charge of managing and centralizing the corresponding documentation with the agency of qualification.
- **Green revolving credit facility**, whose objective is not to finance green projects or investments - since the vocation of this line is not to be willing - but it is based on environmental, social and good governance criteria of the company, as the applicable interest rate depends on the ESG 'score' granted by an environmental agency. The higher the ESG 'score', the less interest the company will pay and vice versa, a really new factor in the loan market.
- **Green project finance**, fundamentally based on long-term cash flows generated in a project or portfolio of projects and taking as collateral the assets associated with the projects. The true differentiating element of a 'project finance' is that it is structured based on the long-term predictability of its cash flows based on regulated businesses or with fixed contracts with its clients, suppliers, etc. Many projects are eligible for the green seal, beyond the energy sector[53].

A green loan can, for example, finance the development of new houses with almost zero energy consumption. This type of home entails significant savings in energy bills, while contributing to significantly reduce the environmental impact associated with them. Final buyers financing their home through this line of financing could benefit from a bonus on the spread on their "green" mortgage (see Retail Financing below) while increasing their awareness of the importance of caring for the environment[54].

It is worth mentioning separately, the sustainable issues in the loan format of German origin called ***Schuldschein***, through which debt certificates are constituted whose terms are agreed between the signing parties of the loan, which can be distributed a posteriori to other investors other than the lender original. Interestingly, Spain stands out as one of the main emitting areas of this sustainable product, after Germany and the Netherlands[55].

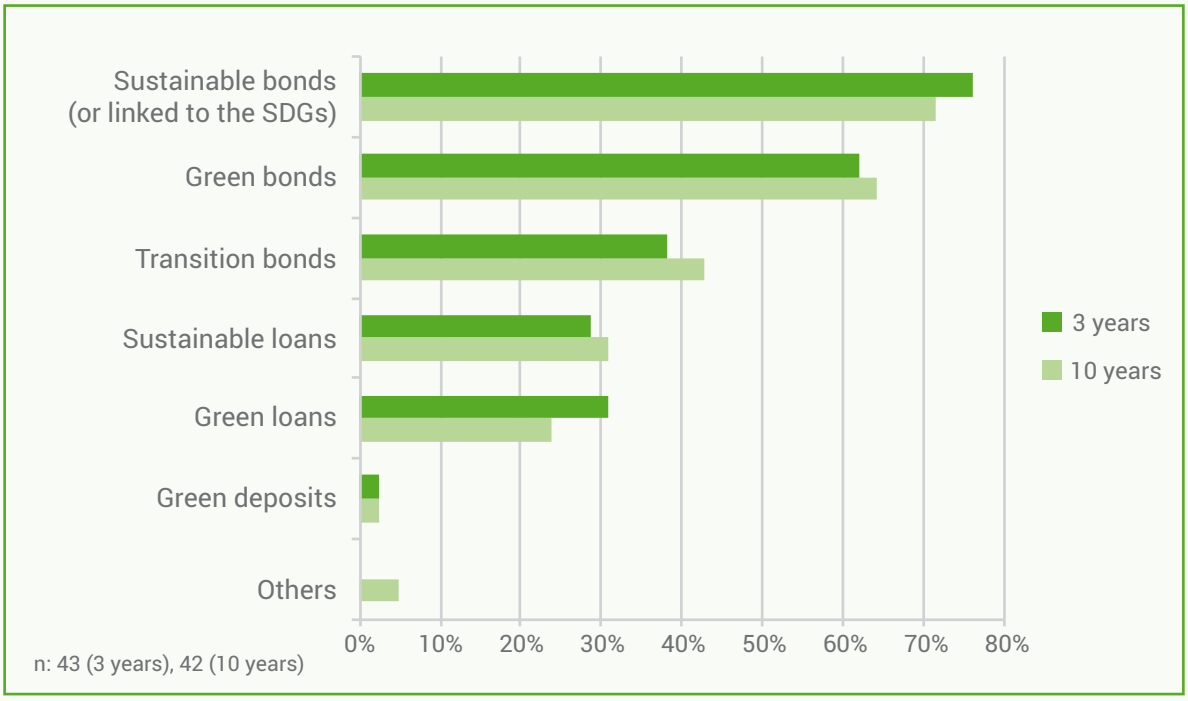
- **Green deposits**: a green deposit can be defined as a deposit associated with a specific pool of eligible assets or projects that meet criteria, such as those of the Climate Bonds Initiative, which can include renewable energy, low-carbon transport, low-carbon buildings, water infrastructure and other green projects[56].

- **Retail financing**: it is still incipient, but a nascent example of a retail climate financing instrument is green mortgages, in which interest rates vary, for example, according to the level of energy certification of the property and, specifically, with emissions in kgCO2 /m^2 and energy consumption kWh/m^2 [57].

SURVEY RESULTS

Question Which financial instruments will be most important for climate finance in the next three and ten years? Select from 1 (one) to a maximum of 3 (three) instruments, if possible.

Results



Comments **Sustainable bonds** (76% and 71%) and, interestingly somewhat less, **green bonds** (62% and 64%) are the financial instruments perceived as the most important for climate finance in the next 3 and 10 years. It is curious that sustainable bonds appear in the first place since they go beyond the purely environmental issues covered by green bonds, but it reflects the faster growth of such instruments and the need to effectively consider social issues even in purely assets and climatic projects.

On the other hand, green deposits (2% and 2%), recently launched by banks like HSBC[58], do not seem to gain importance, at least as long as they are a novelty. But it is also interesting to note that loans, sustainable or green, appear at a much lower level than different types of bonds.

2.8. Legal frameworks

Climate markets and financial instruments do not have specific legal frameworks or regulations beyond what already exists for markets and kinds of instruments such as bonds or loans. For this reason, the importance of developing better regulation is highlighted as the action that can most contribute to the growth of sustainable investment.

As indicated in the previous section, most of the instruments are based on principles, standards or simply **voluntary** recommendations, usually defined by associations of financial entities and with purposes related to environmental or specifically climate issues, as is the case of the Green Bond Principles, developed and updated by ICMA.

However, since 2010, modestly in the US insurance sector, and especially from 2019, after Mark Carney's aforementioned "Tragedy of the Horizon" speech, several supervisors and even the European Commission, began to publish **transparency** requirements and others for banks, investors and other actors.

In 2010, California insurance regulators moved to require insurers to disclose their climate-related risks. The California Department of Insurance's Climate Risk Disclosure Survey has been followed by the states of New York, Connecticut, Minnesota, New Mexico, and Washington and is published jointly and annually covering more than 1,000 insurers and more than 70% of the US insurance market[59].

In 2014, the European Commission published the **European Directive on the Disclosure of Non-Financial and Diversity Information**, obliging more than 6,000 large European companies to annually publish information on "non-financial" aspects, including carbon emissions and climate risks, detailed later in a non-binding guide that addresses climate-related disclosures. Subsequently, securities regulators in Australia, Canada, the US, and other jurisdictions released documents to help companies identify and improve their disclosure of the material risks posed by climate change.

In 2016, in France, the **Article 173** of the Energy Transition Law came into force, which strengthened the mandatory carbon disclosure requirements for publicly traded companies and introduced **carbon reporting for institutional investors**, defined as asset owners and investment managers[60].

In 2019, the UK financial regulator issued a supervisory statement outlining expectations around banks (and insurers) approaches to managing the financial risks of climate change.

In December 2019, the first two regulations stemming from the EU Action Plan on Sustainable Finance (Regulation of Benchmarks and Regulation on Disclosures) entered into force. These regulations not only impact EU-based institutions, but also those incorporated outside the EU that serve or seek to serve EU-based clients.

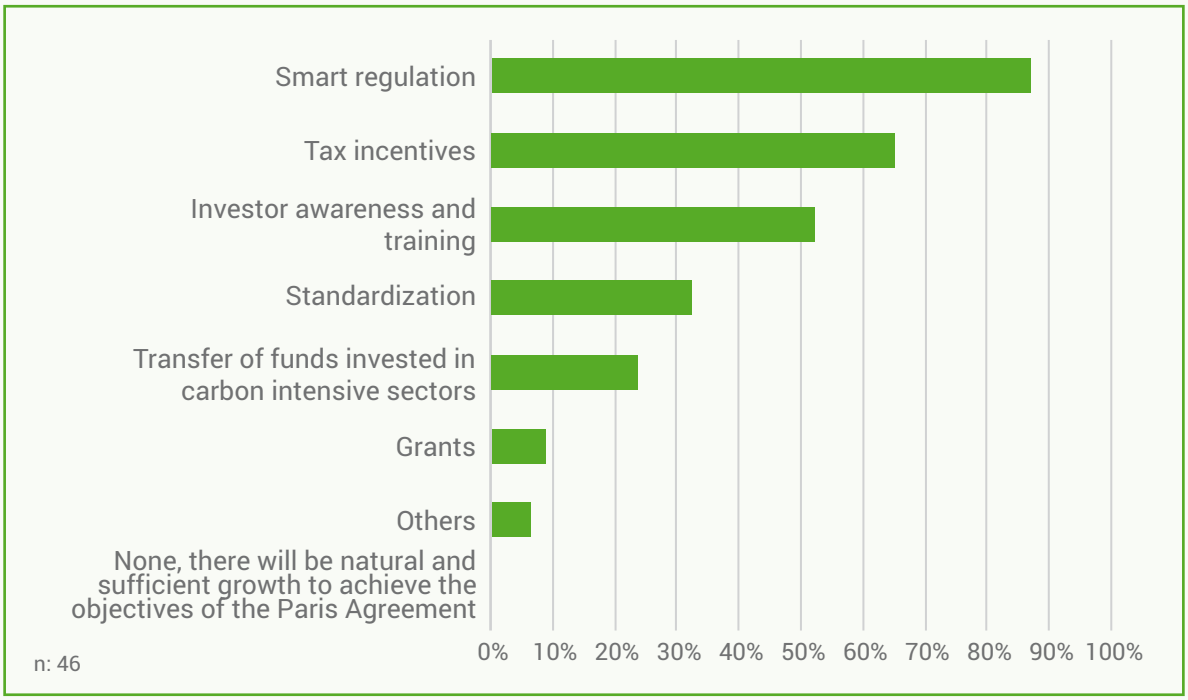
Signs of **fragmentation** around climate risk assessment are already evident, particularly in the areas of prudential regulation and supervision, market and conduct regulation, taxonomy and disclosure[61].

On the other hand, according to the current general financial regulation, the fiduciary duty does not require that a fiduciary account for the impact on the sustainability of its investment activity, beyond its financial performance, which may be affected by climate risks, for example. In other words, the fiduciary duty requires considering how sustainability issues affect the investment decision[62], but not how the investment decision affects sustainability issues, such as climate.

SURVEY RESULTS

Question Which actions can contribute most significantly to the growth of climate investment in Spain in the next three years? Select from 1 (one) to a maximum of 3 (three) actions, if possible.

Results



Comments **Better (smart) regulation** has been the most indicated action, by 87% of those surveyed, which can contribute more significantly to the growth of climate investment in Spain in the next three years. This enormous expectation contrasts with the important weight given to risks related to public policies, but is consistent with optimism with an instrument as important as the new European taxonomy.

Another type of public policy, **tax incentives**, comes in second place, cited by almost two-thirds (65%) of those surveyed as another action that can increase climate investment in Spain. The message is especially important when discussing a new environmental taxation for Spain, especially the draft of the Law on Climate Change and Energy Transition. On the other hand, there is no significant demand for subsidies, indicated by only 9% of those surveyed.

Investor awareness and education appears in third place, but mentioned by more than half (52%) of respondents as an important action for the growth of climate investment. In this case, the private sector or even the third sector can and must act.

Finally, it is interesting to point that no one (0%) believes that we will reach the Paris Agreement naturally.

2.9. Public policies

At the "One Planet Summit" in Paris in December 2017, eight central banks and supervisors established the **Network of Central Banks and Supervisors for Greening the Financial System** (NGFS).

In 2019, the so-called **Coalition of Finance Ministers against Climate Action** was signed, which implies the commitment of about twenty countries, including Spain, to sign the **Helsinki Principles**[63], a document on best practices for sustainability in macroeconomic, fiscal matters and public financial management. All of this lays the foundations for a new economic reality, with an adaptation of the regulatory and supervisory framework that must explicitly integrate the different physical and transition risks associated with climate change[64].

Fiscal policy options revolve around **carbon pricing** (explicit and implicit), expense and investment, and public guarantees. On the other hand, the necessary transformation in the productive structure of the economy requires a change in the structure of underlying financial assets, which implies a role for **financial policy** tools. These policies can be divided into those that aim to correct the lack of accounting for climate risks for financial institutions and those that aim to internalize externalities and co-benefits at the societal level. The first supports mitigation by changing the demand for green and carbon-intensive investments, as well as relative prices. The latter work through similar channels, but raise questions about appropriate policies, allocation of tools, trade-offs, and political economy[65].

Monetary policy tools can play a key role. Some options fall within most **central bank** mandates (reflecting large-scale climate risks, asset purchase programs, or guarantee frameworks), while others are more controversial (green quantitative easing, credit allocation policies, adaptation of monetary policy frameworks)[66].

The table below presents a global overview of macroeconomic and financial policy tools for climate change mitigation:

Policy Area	Policy	Instruments	Examples
Fiscal Policy Tools	Carbon pricing, regulations	National carbon taxes, cap and trade (CaT) and emissions trading systems (ETS), energy efficiency or emissions standards	Sweden Carbon Tax, California CaT, EU ETS, National Tariffs, EU Regulations
	Public spending and investment	Public investment, social spending, lower labor or capital taxes	EU Infrastructure Investment Plan
	Public-Private Partnerships	Partnership between private sector, government, development bank, long-term institutional investor	China Development Bank-Urban Development Investment Corporation
	Public guarantees	Loan commitments, credit or cash flow guarantees, multi-sovereign guarantees	World Bank Multilateral Investment Guarantee Agency (MIGA), European Investment Fund guarantee schemes
Financial Policy Tools	Redressing underpricing and lack of transparency of climate risks	Gathering climate-related financial data, climate-related risk disclosures, taxonomy of green assets, climate-related stress tests, macroprudential tools	Bank of England Supervisory Statement on Climate Change, France Article 173 of Energy Transition Law, Banco Central do Brasil, China mandatory disclosures

Policy Area	Policy	Instruments	Examples
Financial Policy Tools	Reducing short-term bias and improving governance frameworks of financial institutions	Prudential reforms, corporate governance reforms	Promotion of ESG criteria
	Supporting the development of green financial securities	Standardized taxonomy of green assets, low-carbon indices, platforms and active issuance by authorities	PBoC national-level green bond taxonomy
	Actively promoting climate finance using financial regulatory tools	Green supporting and brown penalizing factors in capital requirements, international requirements of min. amount of green assets on balance sheets, notional carbon prices	PBoC macroprudential policy framework, Banque du Liban reserve requirements
Monetary Policy Tools	Integrating climate risk analytics into collateral frameworks, central bank portfolio management, and QE	Developing own risk assessments, ensuring climate risks appropriately reflected in central bank asset portfolios	Bank of England, Bank of Japan, EIB bonds, Bangladesh Bank, DNB, Norges Bank
	Green QE and collateral frameworks	Better access to central bank funding schemes for banks that invest in low-carbon projects, central bank purchases of low-carbon bonds issued by development banks	
	Credit allocation policies	Central bank credit allocation operations, adapting monetary policy frameworks	PBoC, Res. Bank of India, Bangladesh Bank

Table 2. *Macroeconomic and Financial Policy Tools for Climate Change Mitigation (Source: IMF)*[67]

2.10. Nationally determined contributions

The Paris Agreement requires the commitment of all Parties, including developing countries, through Nationally Determined Contributions (NDCs) and to increase their ambitions in the years to come[68].

This includes an obligation for all parties to periodically report on their emissions and on their implementation efforts[69].

A number of 186 countries, including the European Union in 2017, have already submitted their NDCs, although, almost 5 years after the adoption of the Paris Agreement, the international registration of NDCs is still in the internal phase[70].

Nationally determined contributions are at the heart of the Paris Agreement and the achievement of its long-term goals and embody each country's efforts to reduce national emissions and adapt to the effects of climate change. The private sector is invited to contribute to the achievement of the NDCs, which can be interpreted as a **climate investment roadmap** in each country or region.

The Paris Agreement, in its Article 4, also specifies that each country must adopt internal mitigation measures and be accountable in a transparent, exhaustive and comparable manner, avoiding double counting. On the other hand, Article 6 allows voluntary cooperation, including emissions trading between countries, with the participation of the private sector[71].

Taken together, these climate measures will determine whether the targets of the Paris Agreement are achieved, whether greenhouse gases (GHG) emissions reach their peak as soon as possible, and whether rapid reductions take place rapidly, thereafter in accordance with the best available science.

It is understood that peak emissions will take more time for developing country parties, and that emissions reductions are made on the basis of equity and in the context of sustainable development and efforts to eradicate carbon dioxide poverty, which is a key development priority for many developing countries. Each climate plan reflects the country's ambition to reduce emissions, considering its national circumstances and capacities[72]. In 2020, the NDCs should be reviewed and presented, however, the COVID crisis has delayed the process.

2.11. Actors

Climate change is a challenge that demands the participation of actors from various sectors and origins, including the public sector, the private sector and the third sector.

The public sector has funds and other structures created at the international level, as well as national and local actors. At the international level, the main actor is clearly the United Nations Framework Convention on Climate Change (UNFCCC), the Conferences of the Parties (COPs) and their secretariat in Bonn, Germany.

The Convention establishes the operation of a financial mechanism, which can be entrusted to one or more existing international entities. The **Global Environmental Fund** (GEF) has worked as the operating entity of the financial mechanism since the Convention entered into force in 1994 and has $ 4.1 billion in funding for the 2018-2022 cycle[73]. At COP 16, in 2010, the Parties established the **Green Climate Fund** (GCF) and in 2011 they also designated it as the operating entity of the financial mechanism. The financial mechanism is accountable to the COP, which decides its policies, program priorities, and eligibility criteria for funding. In addition to providing guidance to the GEF and GCF, the Parties have established two special funds: the **Special Climate Change Fund** (SCCF) and the **Least Developed Countries Fund** (LDCF), both administered by the GEF, and the **Adaptation Fund** (AF) established under the Kyoto Protocol in 2001[74].

The **Green Climate Fund**, mentioned above, is the largest fund in the world with more than **$ 17 billion** raised. The GCF helps 140 developing countries reduce their greenhouse gas emissions and improve their ability to respond to climate change. The GCF plays a crucial role in complying with the Paris Agreement, supporting the goal of keeping the average global temperature rise well below 2 degrees C. It does so by channelling climate finance to developing countries, which have joined the other nations to commit to climate action[75]. In Spain, the only entity accredited by the GCF is the Spanish Development Financing Company (*Compañía Española de Financiación del Desarrollo, COFIDES*)[76].

The main actors in private climate finance are:

- **Insurers**. Sustainability is an issue that is rapidly gaining relevance for insurance companies. Climate risks, especially acute physical risks, such as floods or hurricanes, pose a serious threat to the sector. According to the latest global survey by asset manager Schroders, more than three-quar-

ters of respondents (78%) expect sustainability to play a bigger role in their portfolios over the next five years. Furthermore, **climate change is currently considered the most important commitment**, ahead of corporate strategies and bribery and corruption, reflecting the increased emphasis of regulators on the way insurers manage sustainability risks[77].

• **Banks**. Banks play an essential economic role in intermediating between investors and companies that need financing. Financing from banks, including private banks, is therefore critical to the climate transition. Climate risks are critical for banks; in fact, the Bank of Spain has already asked banks for board members with expertise on climate risks[78]. It is interesting to note that banks can themselves be issuers of debt, therefore, of climate instruments such as green bonds. They include investment banks who assess market trends and company performance, including evaluating ESG information, to make recommendations to investors. In 2019, under the umbrella of UNEP FI, 28 banks launched the Principles of Responsible Banking, aligned with the Sustainable Development Goals and the Paris Agreement[79]: currently 185 banks, representing a total of more than 49 trillion dollars, in 49 countries have joined the movement[80].

• **Companies**: from the climate finance point of view, companies are the agents, not necessarily "green", that transform the capital of investors or lenders into "green" projects. In order to achieve this, they use several of the instruments already mentioned, although **green bonds** are the main ones.

• **Asset managers**: asset managers have, by the volume of assets they manage, an **uneven potential to finance the transition** to a low-carbon economy. Despite not being the owners of the assets, they can influence the companies in which they invest, but also their clients, such as institutional investors. In addition to his annual letters to the CEOs of invested companies warning that "climate risk is an investment risk"[81], Larry Fink, the CEO of *BlackRock*, this year has sent a letter to his clients, explaining how "sustainability is the new BlackRock's standard for investing" and announcing the divestment in sectors such as coal[82].

• **Institutional Investors**: Institutional investors are the major players in climate finance. It is a large group made up of pension fund managers, investment fund managers, investment companies and collective investment institutions (IIC), but they are also classified separately by their main activities, banks and savings banks, as well as insurance companies. According to another global survey by asset manager *Schroders*, 75% of institutional investors say that the importance of sustainability when investing will be greater in the next five years. Similar to insurers, institutional investors focus on a variety of areas when it comes to engaging in sustainable causes, but **climate change** (54%) and **corporate strategy** (53%) are the issues they consider most important[83].

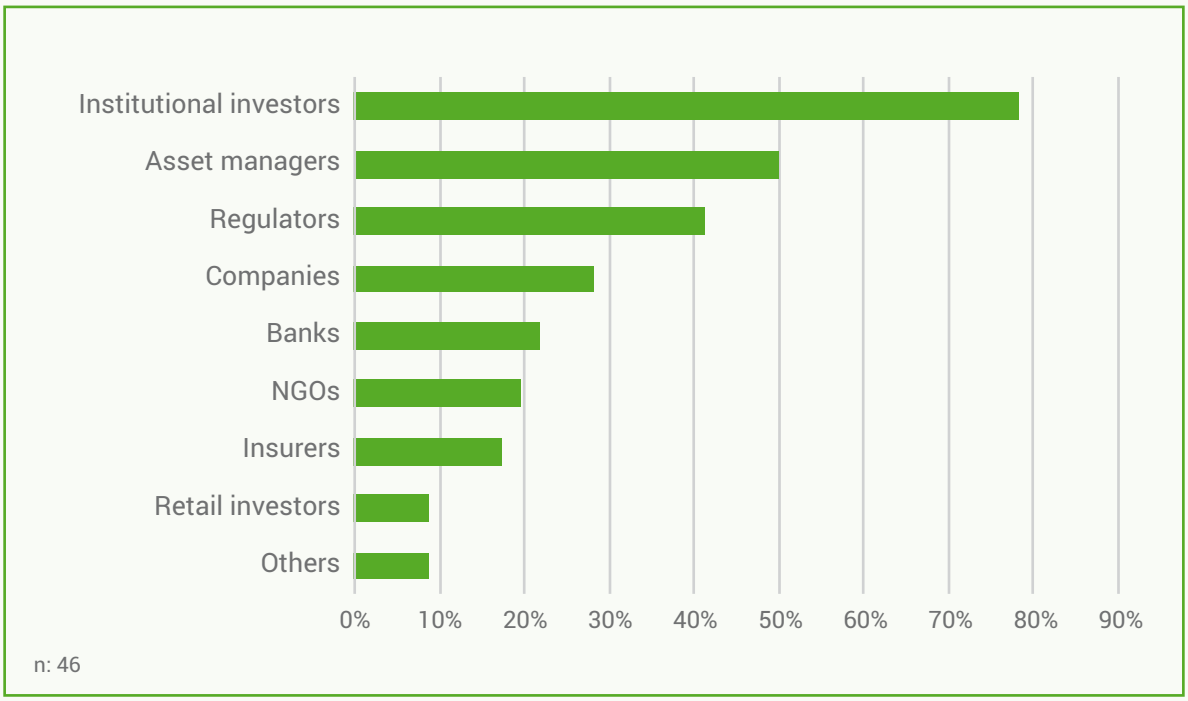
• **Retail investors**: the small investor has more and more opportunities to invest in sustainable finance markets, in addition to more available information and knowledge and experience in the application of ESG criteria. The research has confirmed this perception. (See survey results below).

• **Service Providers**: service providers include law firms, auditors, verifiers, analysts, rating agencies, and consultants. They facilitate understanding and seek to ensure the information provided by bond issuers, for example.

SURVEY RESULTS

Question Who are the actors that are driving climate investment the most? Select between 1 (one) and a maximum of 3 (three) actors, if possible.

Results



Comments 78% of those surveyed understand that **institutional investors** are one of the main players behind the growth of climate investment. Asset managers come second, with 50%, followed by regulators, with 41%. The retail investors, with 9%, appear in last position. In the interviews it was clear that the results do not surprise, even actors such as NGOs, although the role of regulators seems to be undervalued and should grow.

The prominence of institutional investors, concerned with the consequences of climate change in the short and mainly long-term, is growing and is also perceived internationally through initiatives such as Principles for Responsible Investment (PRI), UNEP Finance Initiative, Climate Action 100 + and others.

In a global survey conducted by the *Financial Times* in 2018, when 77% of respondents indicated governments and regulators as important to the energy transition, slightly more than consumers and the general public (67%) and, at least then, much more than investors (45%)[84].

Concern with the **low presence of retail investors** was clear in the interviews. Lack of "financial climate education" - or simply risks. On the other hand, the incipient offering of products - some green mortgages, mutual funds and sustainable consumer loans - and, more importantly, the little information that the managers of retail banking branches is a concern and object of attention, even in the bank itself.

• **Regulators**: institutions that can regulate markets and products, in addition to requiring the disclosure of climate information from the entities under their jurisdiction and, on the other hand, stimulating climate finance. They can include local regulators, national and supranational governments, financial regulators, and stock exchanges. Equivalent regulators may stipulate very different requirements in different markets. The European Commission, including the Directorate General for Financial Stability, Financial Services and Capital Markets Union (DG FISMA) and the Central Banks, especially the Bank of England, the Bank of France and the European Central Bank, are examples of regulators very active in climate finance. In Spain, the Bank of Spain and the National Securities Market Commission (CNMV) are the most active entities.

The developers of principles and standards, especially reporting, although they do not have regulatory status, in practice define how markets work: The International Capital Markets Association (ICMA), the Global Reporting Initiative (GRI) and the Social Accountability Standards Board (SASB) are examples of developers of standards.

• Others: some **public banks** (ICO in Spain, BNDES in Brazil), **national governments** (France, Mexico, Poland and others) and regional (Community of Madrid, Paris/Ile de France and others) are active issuers of green bonds. **Unions** and union confederations, such as *Comisiones Obreras* (CCOO) and the *Unión General de Trabajadores* (UGT) in Spain, especially when they have a presence on the boards of pension funds, also have an important and little-known role. Stock exchanges create ideal trading environments, including green bond issues in which the Luxembourg Stock Exchange stands out.

Environmental **NGOs**, such as WWF and Greenpeace worldwide and also in Spain, bring pressure to avoid "greenwashing", in other words, that investments are really green. Others, such as the Climate Bonds Initiative (CBI) represent investors and specialize in standard setting, information, certification and market development.

Associations of investors, banks, issuers and other stakeholders in sustainable or climate finance create environments for debate, information, research and training. At the global level, the World Economic Forum (WEF) or the World Business Council for Sustainable Development (WBCSD) are examples of more generic but highly influential partnerships. The Principles of Responsible Investment (PRI), the United Nations Environment Programme Finance Initiative (UNEP FI) and the aforementioned International Capital Markets Association (ICMA) they are more specific, but not less influential.

Finally, **universities** and **think-tanks** provide fundamental knowledge and research on markets, actors and instruments.

3. THE PERCEPTION OF RISKS

Climate change and environmental degradation cause structural changes that negatively affect economic activity and, at the same time, the financial system. Climate-related and environmental risks are generally considered to comprise two main risk factors:

- **Physical risk** refers to the financial impact of a changing climate, including more frequent extreme weather events and gradual changes in climate, as well as of environmental degradation, such as air, water and land pollution, water stress, biodiversity loss and deforestation. Physical risk is therefore categorised as "**acute**" when it arises from extreme events, such as droughts, floods and storms, and "**chronic**" when it arises from progressive shifts, such as increasing temperatures, sea-level rises, water stress, biodiversity loss and resource scarcity. This can directly result in, for example, damage to property or reduced productivity, or indirectly lead to subsequent events, such as the disruption of supply chains.
- **Transition risk** refers to an institution's financial loss that can result, directly or indirectly, from the process of adjustment towards a lower-carbon and more environmentally sustainable economy. This could be triggered, for example, by a relatively abrupt adoption of climate and environmental policies, technological progress or changes in market sentiment and preferences[85].

These risks are detailed in the table below:

Risks affected	Physical		Transition	
	Climate-related	Environmental	Climate-related	Environmental
	• Extreme weather events • Chronic weather patterns	• Water stress • Resource scarcity • Biodiversity loss • Pollution • Other	• Policy and regulation • Technology • Market sentiment	• Policy and regulation • Technology • Market sentiment
Credit	The probabilities of default (PD) and loss given default (LGD) of exposures within sectors or geographies vulnerable to physical risk may be impacted, for example, through lower collateral valuations in real estate portfolios as a result of increased flood risk.		Energy efficiency standards may trigger substantial adaptation costs and lower corporate profitability, which may lead to a higher PD as well as lower collateral values.	
Market	Severe physical events may lead to shifts in market expectations and could result in sudden repricing, higher volatility and losses in asset values on some markets.		Transition risk drivers may generate an abrupt repricing of securities and derivatives, for example for products associated with industries affected by asset stranding.	
Operational	The bank's operations may be disrupted due to physical damage to its property, branches and data centres as a result of extreme weather events.		Changing consumer sentiment regarding climate issues can lead to reputation and liability risks for the bank as a result of scandals caused by the financing of environmentally controversial activities.	

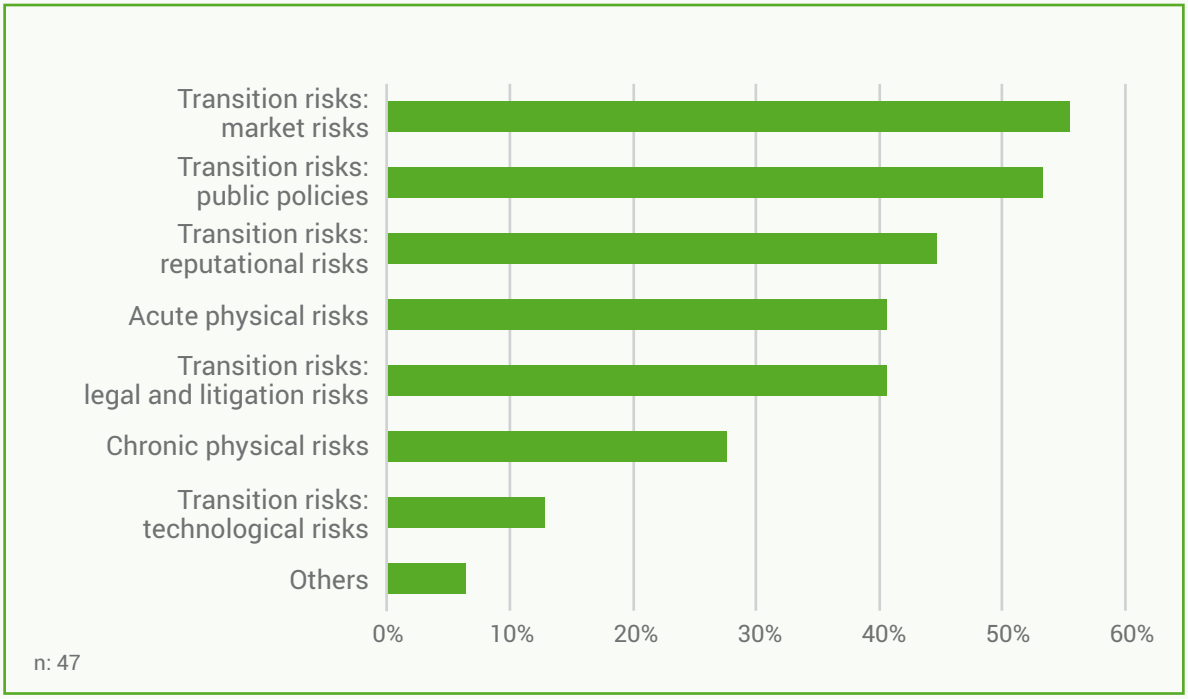
Risks affected	Physical		Transition	
	Climate-related	Environmental	Climate-related	Environmental
	• Extreme weather events • Chronic weather patterns	• Water stress • Resource scarcity • Biodiversity loss • Pollution • Other	• Policy and regulation • Technology • Market sentiment	• Policy and regulation • Technology • Market sentiment
Other risk types (liquidity, business model)	Liquidity risk may be affected in the event of clients withdrawing money from their accounts in order to finance damage repairs.		Transition risk drivers may affect the viability of some business lines and lead to strategic risk for specific business models if the necessary adaptation or diversification is not implemented. An abrupt repricing of securities may reduce the value of banks' high quality liquid assets, thereby affecting liquidity buffers.	

Table 3. *Examples of climate-related and environmental risk drivers (Source: European Central Bank)* [86]

SURVEY RESULTS

Question What are the most important climate risks for the financial sector? Select between 1 (one) and a maximum of 3 (three) risks, if possible.

Results



Comments **Transition risks**: **market** (55%), **public policies** (53%) and, to a lesser extent, reputational risks (45%), are the risks perceived as most important for those surveyed. At the other extreme, technology risks concern only 13%. The importance of market risks is consistent with the prominence of institutional investors who are effectively changing demand, although in interviews they resent the lack of comparable supply.

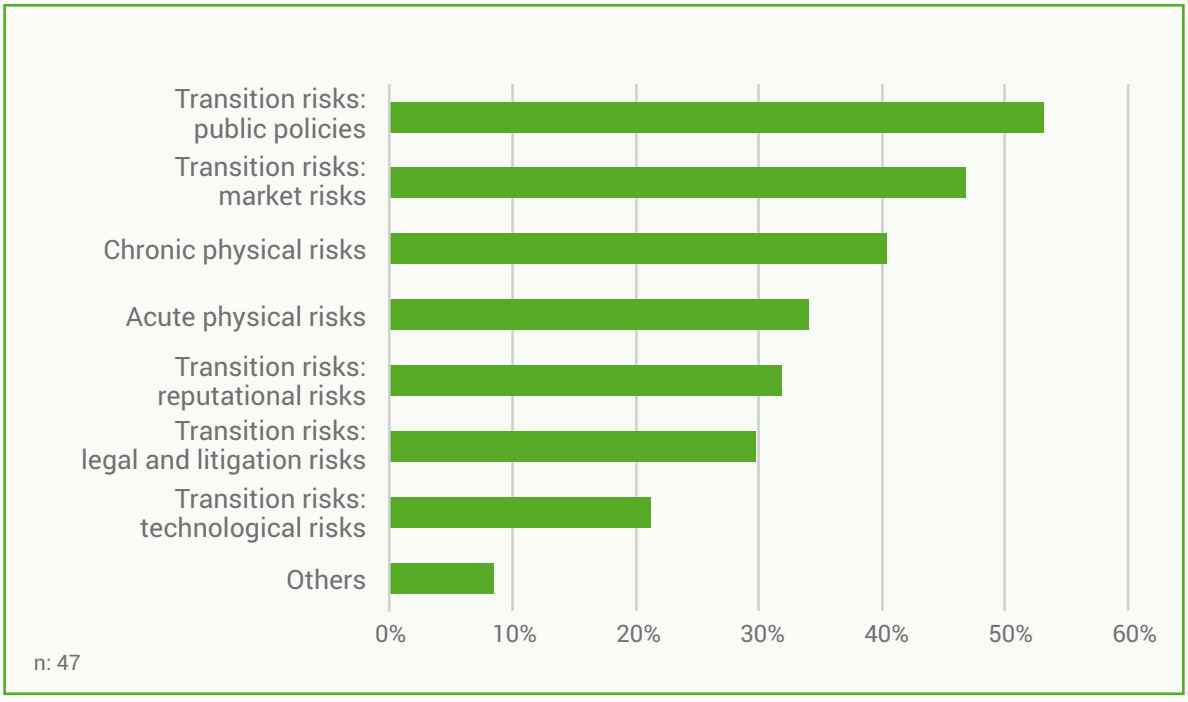
The concern with risks related to public policies appears to be in contradiction with the demand for regulation - and the increasing prominence of regulators in recent months. However, it should be noted that the demand is for smart regulation: Europe's climate investment taxonomy, highlighted below, seems to be an example.

Finally, it is surprising that several of the interviewees select a less tangible risk category as "**reputational risks**" over physical risks, for example, which shows the interest of market players in taking care of their "climatic" reputation.

SURVEY RESULTS

Question What are the most important climate risks for investors? Select between 1 (one) and a maximum of 3 (three) risks, if possible.

Results

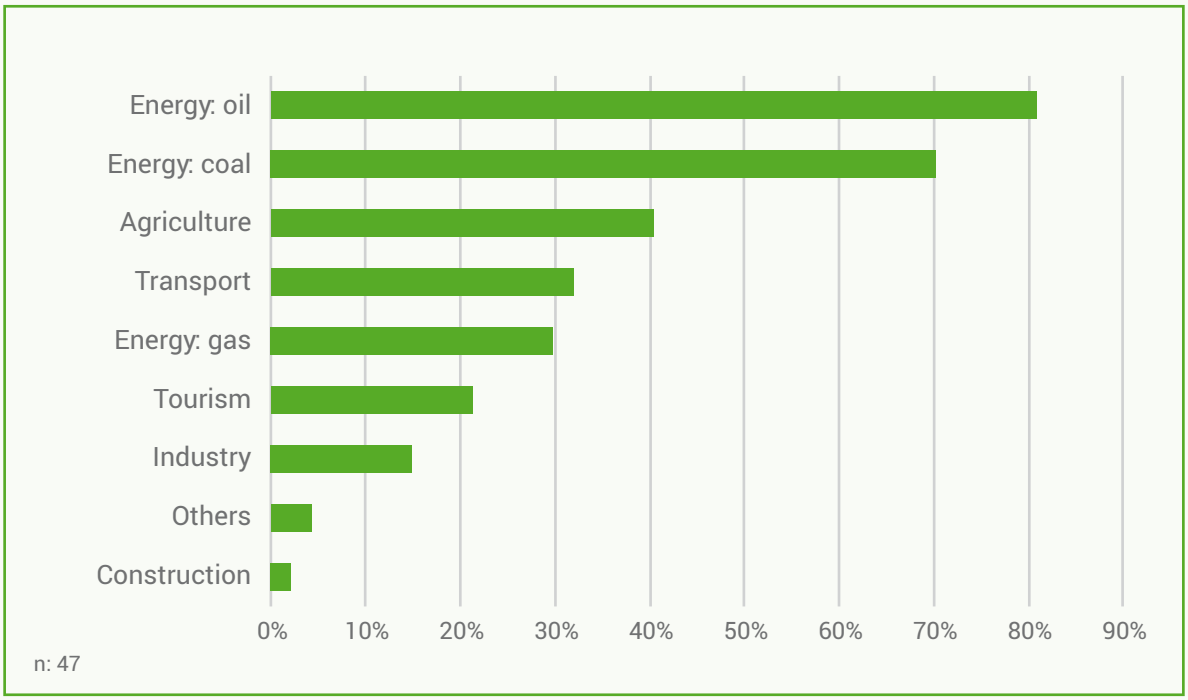


Comments When asking about the most important risks specifically for **investors**, there is a change of positions with respect to the previous question between **transition risks** related to public policies, which appears in first place with 53% and the transition risks related to changes in supply and demand (market risks), with 47%. Physical risks, especially chronic ones (40%) take on a little more prominence and, on the other hand, technological risks remain less worrying, although this question is higher for investors (21%), who, in the previous question, for the entire sector (13%), due to investors' commitment to various projects with important technological innovation components.

SURVEY RESULTS

Question Which sectors of the Spanish economy are going to be most negatively affected by climate risks? Select between 1 (one) and a maximum of 3 (three) risks, if possible.

Results



Comments There is an obvious perception that the **oil** (81%) and **coal** (70%) sectors, the latter already discounting its rapid dismantling in Spain, will be the sectors most negatively affected by climate risks. It may be surprising, for some interviewees, the position of agriculture (40%), above transport (32%), for example, but it may be due to the lack of preparation of the sector in the face of physical risks and, to a lesser extent, to transition risks, such as changes in consumption. There does not seem to be a concern with the construction sector (2%), quite the opposite, since the sector must

benefit from several of the opportunities identified as most important, such as energy efficiency, sustainable construction, resilient infrastructure.

On the other hand, it is interesting to contrast these sectors with the weight of their emissions in Spain. According to the latest National Emissions Inventory, in 2018 the sector with the most weight in emissions was transport (27.0%), followed by industrial activities (19.9%), electricity generation (17, 8%) and agriculture (11.9%)[87].

3.1. The case of fossil fuels

The research has shown that the oil sectors and, with less and less economic, environmental and social weight, coal are perceived as the two sectors of the Spanish economy most negatively affected by climate risks. Adding natural gas - whose risk importance in the survey has been undervalued in the opinion of some interviewees - we the important case of the **fossil fuels**.

80% of the energy we consume comes from fossil fuels[88]. However, they release carbon dioxide and other greenhouse gases (GHG), and it is the **main cause of global warming and climate change**[89], even when emissions of methane, another GHG, have been underestimated[90]. In addition, they are non-renewable materials and the geographical distribution of the deposits is highly concentrated in very specific regions. Last but not least, the burning of these fuels pollutes the air, creating public health problems. In total, outdoor air pollution is among the world's greatest **public health** risks, responsible for nearly 4.5 million deaths worldwide in 2015[91].

There are several main groups of fossil fuels, including[92]:

- **Coal**: Mined via surface or underground methods, **coal supplies a third of all energy worldwide**, with the top coal consumers and producers in 2018 being China, India, and the United States.

  Carbon dioxide emissions from burning coal account for 44% of the world total, and it's the **biggest single source of the global temperature increase** above pre-industrial levels. The health and environmental consequences of coal use, along with competition from cheap natural gas, have contributed to its decline in the U.S. and elsewhere. But in other places, such as India, demand is expected to rise through 2023[93].

- **Oil**: Extracted from onshore and offshore wells, crude oil is refined into a variety of petroleum products, including gasoline, diesel, and heating oil. The top oil-producing countries are the U.S., Saudi Arabia, and Russia, which together account for nearly 40% of the world's supply.

  Petroleum use accounts for nearly **a third of the global total** carbon emissions. In addition to the air pollution released when oil is burned, drilling and transport have led to several major accidents, such as the Exxon Valdez spill in 1989, the Deepwater Horizon disaster in 2010, the devastating Lac Megantic oil train derailment in 2013, and thousands of pipeline incidents. Nonetheless, oil demand continues to rise, driven not only by our thirst for mobility, but for the many products—including plastics—made using petrochemicals, which are generally derived from oil and gas.

- **Natural gas**: Both natural gas and oil production have surged in the U.S. over the past two decades because of advances in the drilling technique most people know as fracking, that has allowed to extract resources that were previously too costly to reach. As a result, natural gas has surpassed coal to become the top fuel for U.S. electricity production, and the U.S. leads the world in natural gas production, followed by Russia and Iran.

  Natural gas is cleaner than coal and oil in terms of emissions, but nonetheless accounts for a **fifth of the world's total**, not counting the so-called fugitive emissions that escape from the industry, which can be significant. Not all of the world's natural gas sources are being actively mined. Undersea methane hydrates, for example, where gas is trapped in frozen water, are being eyed as a potential gas resource.

The **decarbonization** of the economy seems to have no return: the oil companies themselves, including the Spanish Repsol, BP and Shell, have already committed to net zero emissions by 2050, at least of their scope 1 and 2 emissions.

As a result, "**stranded assets**" are increasing in the fossil fuel sector and, to a lesser extent, in other sectors. A stranded asset is "any asset that has suffered unforeseen or premature amortization, devaluation or conversion to liability"[94]. These transformations can be caused by climate change and the transition to a low-carbon economy. The oil companies themselves are beginning to eliminate from their balance sheets, and other **"existential" threats** - as former BP CEO Lord Browne famously said as early as 2014 - to the sector[95]. Under the low-carbon economy approach, "stranded assets" are assets (such as drilling rigs and distribution infrastructures), sectors and companies that own oil reserves for example (and the assets linked to them) that may suffer strong revaluations before the end of their useful life, that is, they can be "stranded" in the transition to a low-carbon economy[96].

As a result of all this, investors are also trying to get rid of positions linked to fossil fuels, especially coal, such as the aforementioned case of the announcement of divestments by the fund manager BlackRock.

On the other hand, **WWF**, the well-known NGO and important activists in climate finance, has published the "Asset owner guide to oil & gas producers"[97]: it offers recommendations on how asset owners can align investment in the oil and gas sector with the objectives of the Paris Agreement on Climate Change. Based on climate science, the guide argues that asset owners should remove virtually all oil and gas investments from the portfolio by **2040** - that is, not immediately - in OECD countries and, globally, to 2050.

On August 25, 2020, **Dow Jones excluded the oil company ExxonMobil from its well-known index**. The move has had wide repercussions since the company, founded in 1870, was, until recently, the company with the largest capitalization in the world[98] and was a security classified as "safe" for pension funds, other institutional investors and retail investors until that time. The company was valued at 525 billion dollars in 2007, but in August 2020 its value had fallen to 180 billion , as a result of the fall in oil prices and due to structural trends in the economies[99], including decarbonization movements markets.

4. THE PERCEPTION OF OPPORTUNITIES

The transition to a low-carbon economy offers investment opportunities in almost all sectors, both for mitigation and adaptation to climate change.

At the same time, the perception is growing that green projects must consider broader aspects of sustainable development[100], especially a **just transition**, or "do no significant harm" to other environmental aspects, as defined by the new taxonomy of Europe .

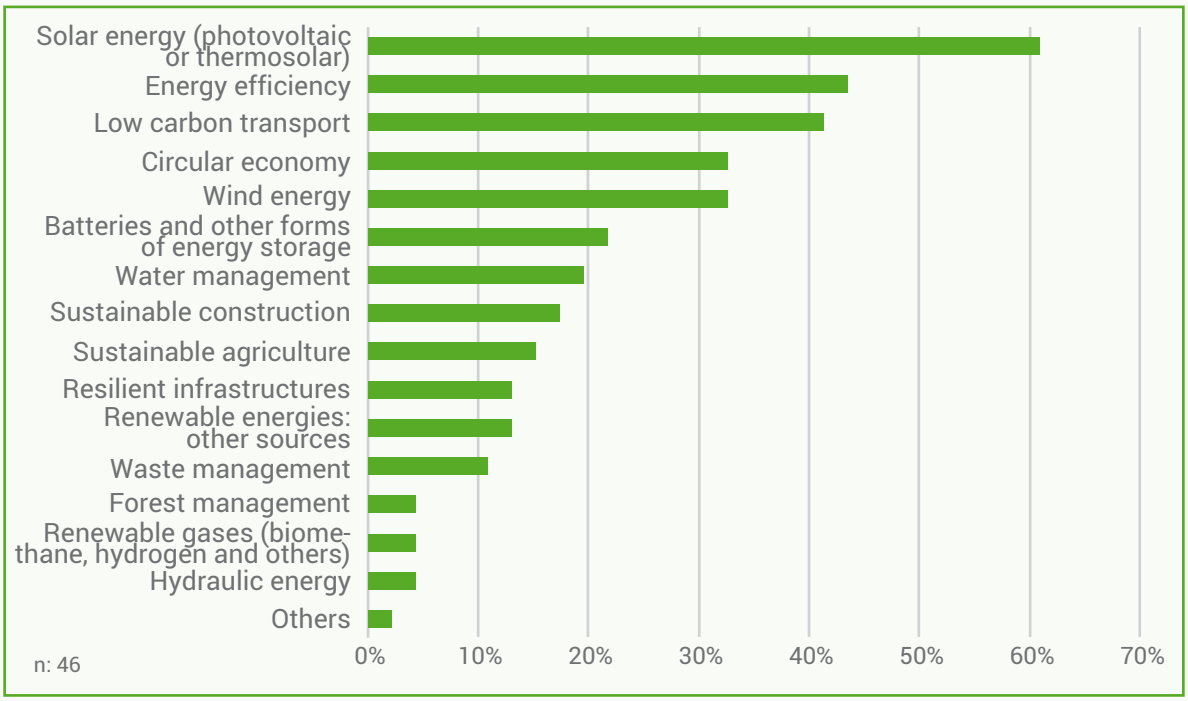
To the traditional list of green projects, as defined for instance by the Green Bond Principles, the activities defined as "sustainable" are added in the new taxonomy of Europe. In Spain, the investment volumes estimated in the National Integrated Energy and Climate Plan (*Plan Nacional Integrado de Energía y Clima*, PNIECC)[101] is a reference for investors in energy efficiency, renewable energies and energy transmission networks.

In this chapter, two outstanding cases are further developed as investment opportunities: renewable energies and energy efficiency.

SURVEY RESULTS

Question Which sectors or projects present the greatest opportunities for climate investment in Spain at the moment? Select between 1 (one) and a maximum of 3 (three) sectors or projects, if possible.

Results



Comments It is not surprising that the solar energy sector is clearly the big bet of current investments with 61% of those surveyed indicating that it is one of the most important sectors, followed by energy efficiency (43%) and low-carbon transport (41%).

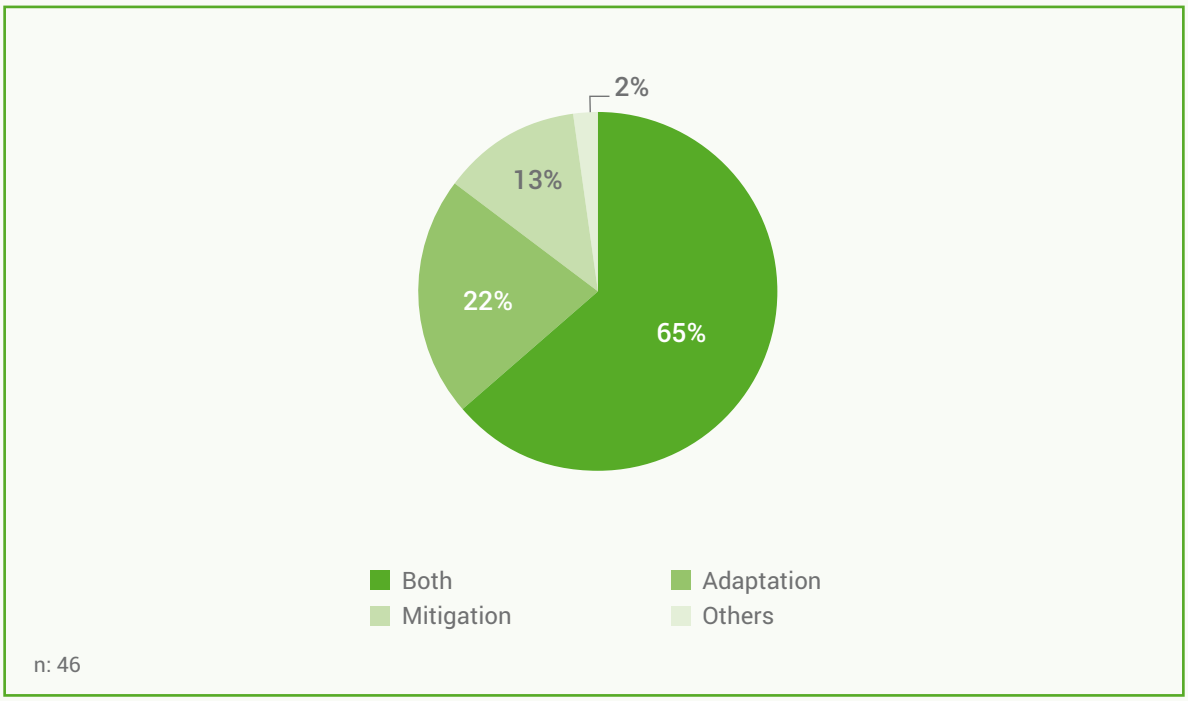
On the other hand, renewable gases and, especially in Spain, forestry management, renewable gases such as hydrogen and hydraulic energy, all with 4%, do not seem to represent great opportunities for investment. In any case, it is important to notice that soon after the survey was carried out, the EU unveiled an action plan for hydrogen.

Finally, it is surprising to some interviewees that wind energy or energy storage are not perceived as more important. The first seems to benefit less from the accelerated cost reduction observed in solar energy and the second is due to a lack of awareness and lack of prominence in Spain and Europe in the battery sector.

SURVEY RESULTS

Question What kind of climate action represents the greatest investment opportunities? Select an option.

Results



n: 46

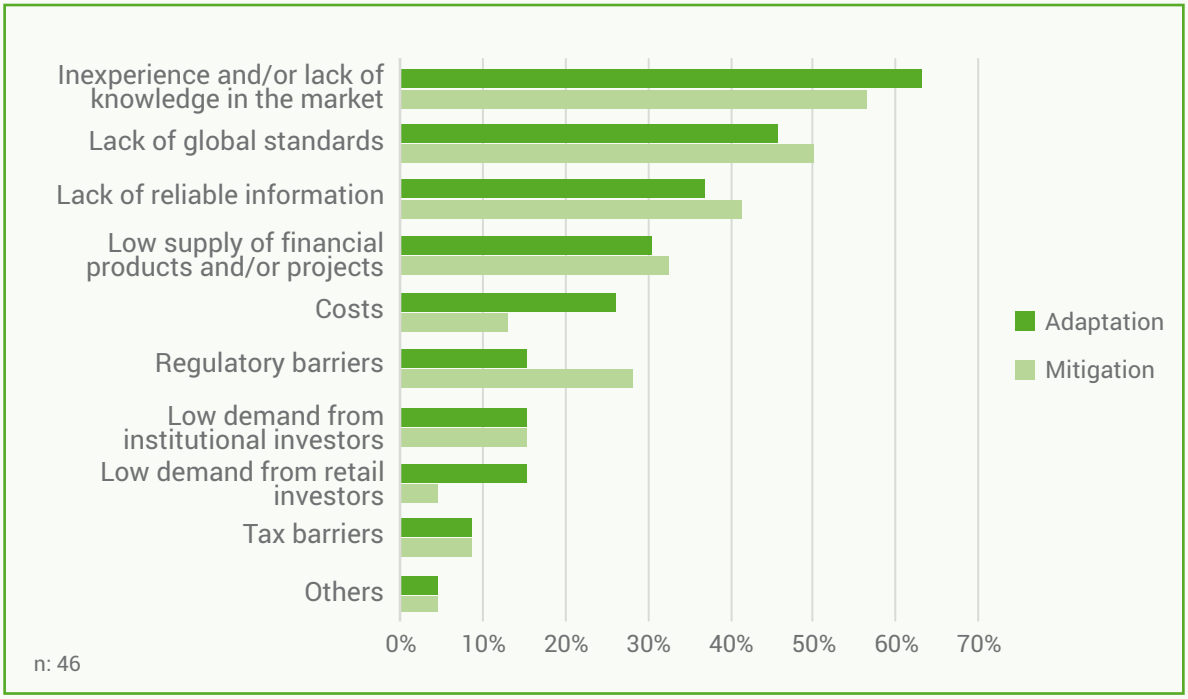
Comments Between **mitigation and adaptation** actions, the answer is overwhelming: almost two-thirds (65%) of those surveyed believe that **both present great opportunities**. The result draws the attention of some interviewees since adaptation actions - which also have another 22% taken in isolation, much more than mitigation (13%) - are less defined than mitigation.

Also, there seems to be a possible contradiction with the sectors identified as most important in the previous question, in which sectors related to mitigation, such as solar energy or energy efficiency, are clearly more important. In any case, it is clear, due to the climatic urgency, that investment should not only go to one type of action or another.

SURVEY RESULTS

Question What are the most important barriers to investment in climate change adaptation and mitigation? Select between 1 (one) and a maximum of 3 (three) barriers, if possible.

Results



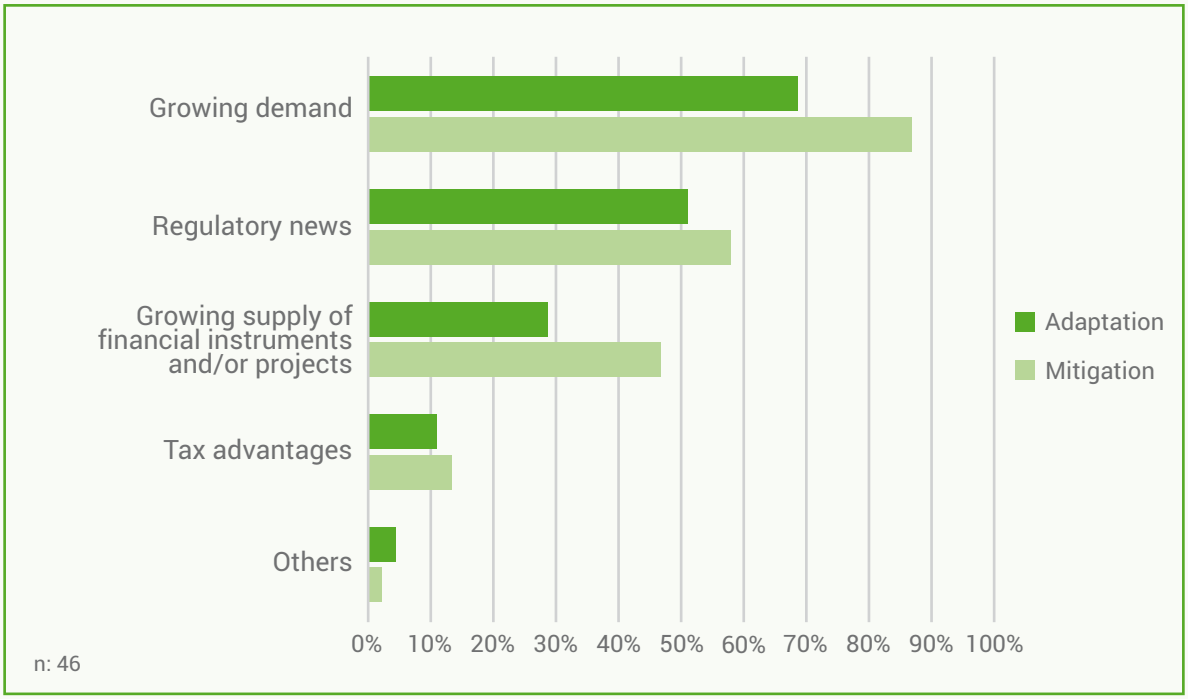
Comments The three barriers indicated as the most important for investment in adaptation and mitigation of climate change are **inexperience and/or lack of knowledge in the market** (63% and 57%), **lack of global standards** (50% and 46 %) and the lack of reliable information (41% and 37%).

It is interesting to observe that they are all "soft" barriers related to knowledge and information and less complicated than cost, supply and demand barriers. On the other hand, tax barriers are not perceived as important and low demand from retail investors would be even less relevant as a barrier to mitigation.

SURVEY RESULTS

Question What are the most important existing drivers for investment in climate change adaptation and mitigation? Select between 1 (one) and a maximum of 3 (three) drivers, if possible.

Results



Comments The most important existing driver for investment in adaptation and mitigation is undoubtedly the growing demand (69% and 87% respectively) – especially from institutional investors, followed by regulatory developments (51% and 58%). The research shows that the climate investment market is a demand market, although the role of the regulator must increase, especially Europe, with developments, such as the European taxonomy, becoming increasingly important.

Tax advantages are not an important driver, which has been confirmed in the interviews, since they practically do not exist at the moment, although the government plans to review environmental[102] taxation, also urged by the Bank of Spain[103] and also present in the plans of Europe's green recovery[104].

4.1. The case of renewable energies

In order to achieve the **decarbonisation** targets, a significant development of **renewable energies** is necessary.

Renewable energies, especially **solar energy** in its different variants such as photovoltaic or thermosolar, represent one of the biggest bets for climate investment. In fact, renewable energy generation is the fast-

est growing globally, with more than 8,000 TWh of growth between 2016 and 2040 – more than twice than any other energy source[105].

The latest edition of the annual report on Global Trends in Renewable Energy Investments from the United Nations Environment Program (UNEP), which has followed trends and opportunities in the sector since 2004, shows that global investment in renewable energy capacity reached $ 272.9 billion in 2018, far exceeding investments in new generation of fossil fuels. 2018 was the fifth year in a row in which investment in renewable capacity exceeded $ 250 billion. The global investment figures for 2018 were 12% lower than the previous year, but UNEP assures that this is not a step backwards, since renewable energy, and in particular solar photovoltaic, is increasingly cheaper[106].

The results of the research confirm this trend, placing **solar energy** as the most important investment opportunity in the present, in the next 3 years and in the next 10 years. The prominence of solar energy matches with a survey carried out worldwide by the *Financial Times* two years ago, when solar energy appeared as a "legitimate" source to replace fossil fuels for 90% of those surveyed, followed by wind energy and, somewhat less, of hydroelectricity, both with approximately 80%[107].

According to the Wind Business Association (*Asociación Empresarial Eólica*, AEE), Spain presents 25,704 MW of accumulated power, and wind energy has been the second source of peninsular electricity generation in Spain in 2019 (20.8%). Spain is the fifth country in the world by installed wind power, after China, the United States, Germany and India, and the third largest exporter of wind turbines in the world, after Denmark and Germany[108]. However, Spain still has considerable potential to install wind farms, in addition to exporting technology to other markets.

Other renewable energy sources are currently much less important for investment. According to the aforementioned UNEP report, Global Trends in Renewable Energy Investments, during the decade of 2010- 2019, 2.6 trillion dollars have been invested in renewable energy, distributed as following: solar: USD 1,349 trillion; wind: USD 1,023 trillion; **biomass and waste** (USD 0.115 trillion); **small hydroelectric plants** (USD 0.043 trillion); **biofuels** (USD 0.027 trillion) and **geothermal energy** (USD 0.020 trillion)[109].

UNEP does not include **large hydroelectric projects** (> 50MW) in its annual report because it considers them as old technology and not sharing the same market dynamics as new renewable sources, because of the difficulty of specifying values. However, estimates show that USD 16 billion had been invested in 2018, 64% less than in 2017 (USD 45 billion)[110]: in any case, one or two orders of magnitude lower than solar and wind.

Renewable energies today are cheaper than ever. The average price of a solar module has fallen 88% since 2010, while the cost of wind turbines has dropped by more than 40%.

In Spain, the draft Law on Climate Change and Energy Transition forecast that by 2030 there will be a 70% generation from renewable energy sources and that by 2050 all the electricity consumed will come from renewable energy sources[111].

The intermittence of solar and wind energy is one of the barriers for a more determined commitment to these energy sources, which opens up investments in **energy storage** systems as a spin-off opportunity, mentioned by some respondents and interviewees. In fact, the draft Law on Climate Change and Energy Transition considers energy storage using hydraulic technology as a solution:

*"(...)The ambitious goals of integration of renewables must necessarily be accompanied by measures aimed at covering the **intermittency** and non-manageability intrinsic to non-storable primary energy sources. Specifically, non-flowing hydraulic technology is called upon to play a fundamental role in the integration of renewable energies in the electrical system, because its rapid response and manageability allow to maximize the penetration of technologies, guaranteeing supply at all times. In addition, in the case of **reversible plants**, the benefit is double, since the surpluses that can be produced in non-manageable renewable generation can be absorbed by these plants, minimizing the risk of spillage and optimizing the use of available generation capacity."*[112]

Other solutions to the problem of intermittency, such as batteries or even smart grids, are not explicitly contemplated in the preliminary draft of the Law, though regarding reversible hydroelectric plants, the document then states the following in Article 6:

TITLE II

Renewable energy and energetic efficiency

Article 6. Electricity generation in the public hydraulic domain.

*1. In order to meet the renewable energy objectives established in this law, the **new concessions** that are granted, in accordance with the provisions of the water legislation on the public hydraulic domain for the generation of electricity, will have as a **priority support for the integration of renewable technologies** in the electricity system.*

*To this end, **reversible hydroelectric plants** will be promoted, in particular, provided that they comply with the environmental objectives of the water bodies and the ecological flow regimes established in the river basin management plans and are compatible with the rights granted to third parties, with the efficient management of the resource and its environmental protection.*

*2. Regulations will establish the technical conditions to carry out **pumping, storage and turbinating** to maximize the integration of renewable energies. Said conditions will consider the provisions of the preceding paragraph.*[113]

4.2. The case of energy efficiency

Energy efficiency, defined as "the more efficient use of energy at all the stages of the energy chain from production to final consumption"[114], is known as the best climate mitigation action[115] since it effectively ***reduces demand*** of energy. However, it has always had a low importance in climate investments, which seems to be changing as this research indicates – in that it appears in second place as the most important sector or group of projects.

According to UNEP and IEA, the ***building and construction secto***r represented 36% of final energy use and 39% of carbon dioxide (CO2) emissions related to energy and processes in 2018, 11% of which was due to the manufacture of construction materials and products such as steel, cement and glass[116]. In Europe, almost 50% of final energy consumption belongs to heating and cooling, of which 80% is consumed in buildings[117].

Energy efficiency is a ***labour intensive sector***. Even before the current crisis, in the United States and Europe alone, more than 3.3 million people held jobs in the energy efficiency industry, with the majority working in small and medium-sized businesses[118].

In September of 2019, during the Climate Summit organized by the United Nations Secretary General, countries and the private sector committed to a carbon-free buildings sector and the goal of mobilizing USD 1 trillion in new "Paris-compliant" investments. The promotion of investments in developing countries by 2030 was established. At the same time, the ***Net-Zero Asset Owner Alliance*** was founded with the world's largest pension funds and insurance companies, responsible for managing more than $ 2.4 trillion in investments – committed to carbon neutral investment portfolios by 2050[119].

Europe counts on a legal framework covering the energy efficiency of buildings and energy efficiency in general: the Directive (EU) 2018/844[120]. In Spain, the aforementioned draft law on climate change and energy transition provides:

> *(…) among the important transformations that are going to take place in the energy system, and therefore in the economy as a whole, as a consequence of the energy transition promoted by this law, is the systematic improvement of the energy efficiency of the economy*[121].

And it determines, among other measures:

> *TITLE I*
>
> *Objectives and planning of the energy transition*
>
> *Article 3. Objectives to reduce greenhouse gas emissions, renewable energies and energy efficiency.*
>
> *(…)*
>
> *d)* ***Improve energy efficiency by reducing primary energy consumption*** *by at least 35%, with respect to the baseline according to community regulations*
>
> *TITLE II*
>
> *Renewable energy and energetic efficiency*
>
> *(…)*
>
> *Article 7.* ***Energy efficiency and renovation of buildings****.*
>
> *1.* ***The Government will promote and facilitate the efficient use of energy*** *and the use of energy from renewable sources in the field of construction, without prejudice to the powers that correspond to the autonomous communities.*
>
> *2. The measures referred to in the previous paragraph, the technical regulation on energy and the long-term Strategy for the rehabilitation of buildings will be consistent with the objectives established in the successive Integrated Energy and Climate Plans.*[122]

At the same time, market forces appear to be having an effect. Green building certifications, such as BREEAM in the UK or LEED in the US, which measure aspects such as energy, waste and water, are added to the market value of real estate assets[123].

5. THE PARIS AGREEMENT AND ITS IMPLEMENTATION

The Paris Agreement adopted by 195 countries meeting in Paris on the 12th of December of 2015 is, together with the United Nations Framework Convention on Climate Change (UNFCCC) adopted in New York on the 9th of May of 1992, **the most important document in the fight against climate change**. Once ratified by more than 55 countries, representing more than 55% of global emissions, the Paris Agreement has been in force since 2016[124]. At present, 186 countries have ratified the document[125].

The Paris Agreement is a historic agreement and sets, among other objectives, "Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development"[126] and it establishes, in Article 9, that the provision of a higher level of financial resources should seek a balance between adaptation and mitigation[127].

However, this research concludes that the Paris Agreement is not enough by itself to stimulate climate investments.

Rules for the implementation of the historical document are still undefined. And they will continue to be until summer of 2021 at least, as the 26th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP26) has been postponed due to the COVID crisis. Of particular concern is the absence of regulation of **Article 6** that deals with emissions trading – essential to optimize the cost of emissions and stimulate investment – and which seeks, among other objectives, to encourage and facilitate participation in the mitigation of greenhouse effect gas emissions from **public and private entities** and increase the participation of the **public and private sectors** in the implementation of nationally determined contributions[128].

Another concern is the effective **withdrawal of the United States** – the largest historic emitter of greenhouse gases and the second largest emitter today, after China – from the Agreement. In 2017, President Donald Trump announced his intention to leave the agreement[129], also formalized in 2019, but which is **not effective until November 4, 2020**, a day after the presidential elections in that country.

The position of the current US government has not been followed by any other country and, also importantly, several states, cities, companies, investors and representatives of US civil society have reaffirmed their commitments to the fight against climate change and maintained stocks and investments, although below what US' support and leadership could provide.

6. JUST TRANSITION AND ITS FINANCING

Another opportunity derived from the change of the economic model towards a low-emission model is the creation of quality employment that is resilient to the effects of climate change. The International Labor Organization (ILO) itself recognizes that, during the transition to environmentally sustainable economies and societies, the world of work can benefit from some important **opportunities**, such as:

a) **Net gains in total employment** from realizing the potential to create significant numbers of additional decent jobs through investments into environmentally sustainable production and consumption and management of natural resources;

b) **Improvements in job quality and income** on a large scale from more productive processes, as well as greener products and services in sectors like agriculture, construction, recycling and tourism; and

c) **Social inclusion** through improved access to affordable, environmentally sustainable energy and payments for environmental services, for instance, which are of particular relevance to women and residents in rural areas[130].

Also according to the ILO, a **just transition** requires workers, communities, employers and governments to engage in social dialogue to establish the concrete plans, policies and investments necessary for a rapid and just transformation. It focuses on jobs and livelihoods and ensuring that no one is left behind in the race to reduce emissions, protect the climate, and promote social and economic justice[131].

The Paris Agreement "takes into account" the "just transition of the workforce and the creation of decent work and quality jobs", but it is silent in its articles on the social impacts of its implementation[132].

In 2016, the United Nations Framework Convention on Climate Change presented a technical document where the term "just transition" was used, including measures to reduce job losses and avoid the effect of the elimination of the industry on communities and workers, as well as measures to produce new jobs and decent and "green" sectors and healthy communities[133].

Finally, in 2018, during COP24 in Katowice, Poland, more than 50 countries, including Spain, signed the Solidarity and Just Transition: Silesia Declaration[134], with the support of trade unions[135], which agreed, among other things, on the "creation of jobs of decent quality ", construction of "resilient infrastructure" and guarantee a "decent future for workers affected by the transition"[136].

In January of 2020, Europe approved its **Just Transition Mechanism** (JTM) which provides targeted support to help mobilize a minimum of € 100 billion over the period 2021-2027 in the most affected regions, in order to mitigate the socioeconomic impact of the transition. The Mechanism will lead to the investments needed to help workers and communities that depend on the fossil fuel value chain. It

will also add to the significant contribution from the EU budget through all instruments directly related to the transition.

The Just Transition Mechanism will consist of three main sources of funding:

1) A Just Transition Fund, which will receive **€7.5 billion of fresh EU funds**, coming on top of the Commission's proposal for the next long-term EU budget. In order to tap into their share of the Fund, Member States will, in dialogue with the Commission, have to identify the eligible territories through dedicated territorial just transition plans. They will also have to commit to match each euro from the Just Transition Fund with money from the European Regional Development Fund and the European Social Fund Plus and provide additional national resources. Taken together, this will provide between **€30 and €50 billion of funding**, which will mobilise even more investments. The Fund will primarily provide grants to regions. It will, for example, support workers to develop skills and competences for the job market of the future and help SMEs, start-ups and incubators to create new economic opportunities in these regions. It will also support investments in the clean energy transition, for example in energy efficiency.

2) A dedicated just transition scheme under InvestEU to mobilise up to **€45 billion** of investments. It will seek to attract private investments, including in sustainable energy and transport that benefit those regions and help their economies find new sources of growth.

3) A public sector loan facility with the European Investment Bank backed by the EU budget to mobilise between **€25 and €30 billion** of investments. It will be used for loans for the public sector, for instance, for investments in district heating networks and renovation of buildings. The Commission will come with a legislative proposal to set this up in March 2020.

The Just Transition Mechanism is more than about funding: relying on a **Just Transition Platform**, the Commission will be providing technical assistance to Member States and investors and make sure the affected communities, local authorities, social partners and non-governmental organisations are involved. The Just Transition Mechanism will include a strong governance framework centred on territorial just transition plans[137].

In Spain, the Just Transition Strategy is one of the three pillars of the Strategic Energy and Climate Framework approved by the Government of Spain in 2019[138]. In this context, the draft bill on climate change and energy transition considers:

> *The transition to a decarbonized economy also requires measures that facilitate a just transition for the **most vulnerable groups and geographic areas**.*
>
> *The transition towards a more ecological productive model that is socially beneficial, in a country with high unemployment rates such as Spain, will be achieved by promoting the ecological transition of companies, work methodologies and the labor market in general. These efforts will create decent employment opportunities, increase resource efficiency, and build sustainable low-carbon societies.*[139]

And it establishes five-year strategies at a national level and local just transition agreements:

> *TITLE VI*
>
> *Just transition measures*

*Article 24. **Just Transition Strategy**.*

*1. The Just Transition Strategy constitutes the state-wide instrument aimed at optimizing opportunities in activity and employment in the transition towards an economy low in greenhouse gas emissions and at the identification and adoption of measures that guarantee a equitable and supportive treatment of workers and territories in said transition. The Government will approve, **every five years**, by means of an Agreement of the Council of Ministers, **Just Transition Strategies**, at the joint proposal of the Ministers for the Ecological Transition and the Demographic Challenge; of Labor and Social Economy; Industry, Commerce and Tourism; Agriculture, Fishing and Food; of Transport, Mobility and Urban Agenda; and Science and Innovation, with the participation of the Autonomous Communities and social agents.*

2. The Just Transition Strategy will include the following contents:

*a) **Identification of groups, sectors and territories** potentially vulnerable to the process of transition to a low-carbon economy.*

*b) Analysis of **opportunities** for the creation of economic activity and employment linked to the energy transition.*

*c) Industrial **policies**, research and development, innovation, promotion of economic activity and employment and occupational training for the just transition.*

*d) **Instruments** for monitoring the labor market in the framework of the energy transition through the participation of social agents, such as in the social dialogue tables.*

e) The framework for the preparation of the Just Transition agreements.

*3. The Just Transition Strategy, as well as the instruments for its application and development, will be prepared taking into account the **gender perspective**.*

*Article 25. **Just transition agreements**.*

*1. Within the framework of the Just Transition Strategy, **just transition agreements** will be signed in order to promote economic activity and its modernization, as well as the employability of workers vulnerable to the transition to a low-carbon economy, in particular, in cases of closure or reconversion of facilities.*

*2. These just transition agreements, in which the **autonomous communities** will participate according to the scope of their competences, will be signed between the Ministry for the Ecological Transition and the Demographic Challenge, following a report from the Ministry of Labor and Social Economy, of the Ministry Inclusion, Social Security and Migration and the Ministry of Industry, Tourism and Commerce, and other public administrations, in particular, local entities in geographic areas vulnerable to the transition to a low-carbon economy. Likewise, **companies, organizations from the business sectors**, trade unions, universities, educational centers, environmental associations and non-governmental organizations and other interested or affected entities may participate in these agreements.*

3. The just transition agreements will include:

*a) An **assessment of the state of vulnerability** of the affected geographic area or group.*

*b) **Commitments** of the parties participating in the agreement, including the companies benefiting from support measures for the transition.*

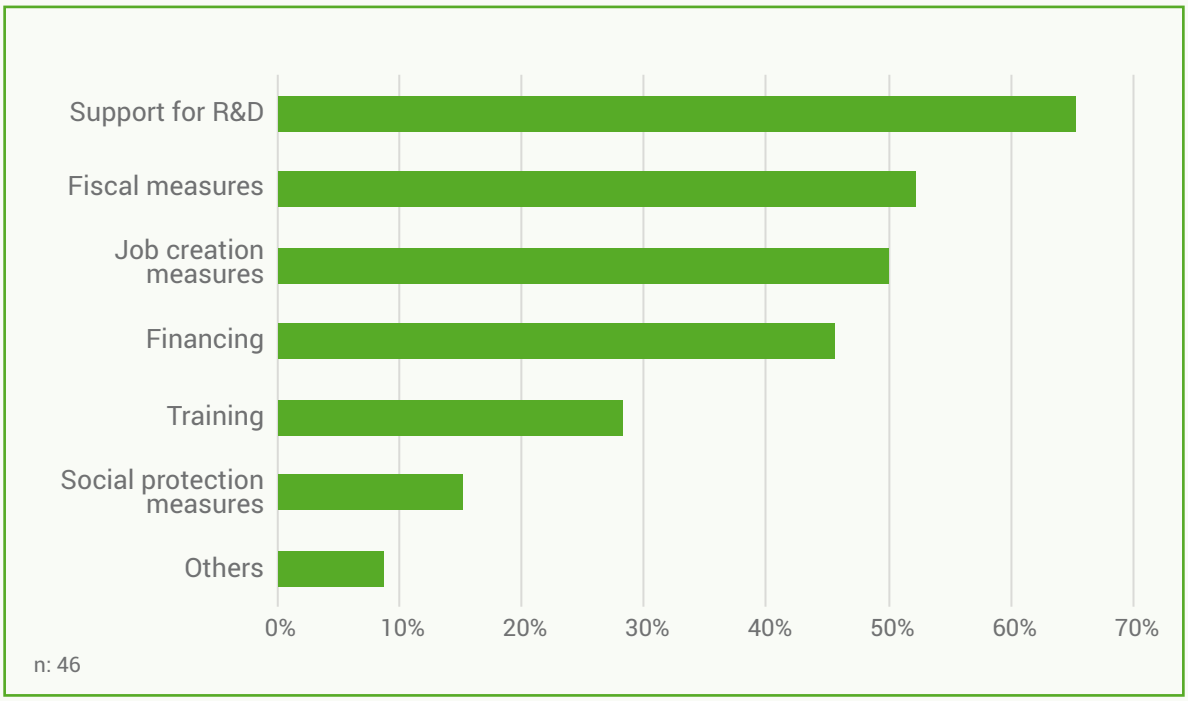
*c) **Tax measures, financing, support for R & D & i, employment, social protection and training activities** to encourage the adaptation of workers, subject to compliance with the objectives established in the agreement.*

*d) A **calendar** for the adoption of the measures, with measurable objectives and follow-up mechanisms(...)*[140]

SURVEY RESULTS

Question Which actions can contribute most significantly to the just transition in Spain? Select between 1 (one) and a maximum of 3 (three) actions, if possible.

Results



Comments **Support for R&D** (65%) is the action understood as the one that can contribute most significantly to the just transition in Spain. Other actions provided for in the draft bill on climate change and energy transition and highlighted in the survey would be fiscal measures (52%) and job creation measures (50%). At the other extreme, social protection measures (15%) seem to be less important.

Considering the definition of just transition, the result has surprised some interviewees since actions of a more social nature, such as measures for job creation, training and especially those for social protection, appear as less important than other measures. However, other interviewees have understood that support for R&D can effectively contribute more to the just transition to the extent that it can facilitate the reconversion of sectors and regions through industries and services with a greater technological component and perspectives of future.

Specifically, **Spain is already one of the pioneer countries** in the implementation of just transition agreements, under the agreement signed in October 2018 between Ministries of Ecological Transition, Ministry of Labour, Unions and Employers: Framework Agreement for a Just Transition of Coal Mining and the Sustainable Development of the Mining Regions for the 2019-2027 Period, responding to decision 2010/787/EU, which requires the closure of coal mines. Moreover, it includes the leverage of a € 250 million in 5 years fund to support business and development initiatives in mining regions[141] [142].

7. APPLICATION OF THE CURRENT REGULATORY FRAMEWORK, NEW EUROPEAN AND GLOBAL INITIATIVES AND NEW TRENDS

This research has asked – through three separate questions – which are the international instruments or initiatives: 1) already adopted by the organizations, 2) adopted and implemented, achieving compliance and 3) that the organization intends to adopt in the next three years.

SURVEY RESULTS

Question Instruments or initiatives: adoption and implementation in the present and adoption in the next 3 years. Which are the most important? Select all the instruments or initiatives already adopted and implemented by your organization reaching compliance, even if it is not validated or externally verified and those that your organization intends to adopt in the next 3 years, even if there is no formal indication.

Comments For the current situation, it is clear that the **European Directive on Disclosure of Non-Financial Statements and Diversity Information**, transposed in Spain by Law 11/2018, is the most widely adopted (53%) and implemented (56%) instrument, since more than half of the sample was made up of organizations that are required to report in accordance with it.

The principles and actions of the Principles for Responsible Investors (PRI), adopted in Spain by 79 entities[143], appear in second place. Surprisingly, the calculation and reporting of Scope 1, 2 and 3 emissions is third: Scope 3 emissions, which include emissions from suppliers and customers, present various technical difficulties in calculating and reporting.

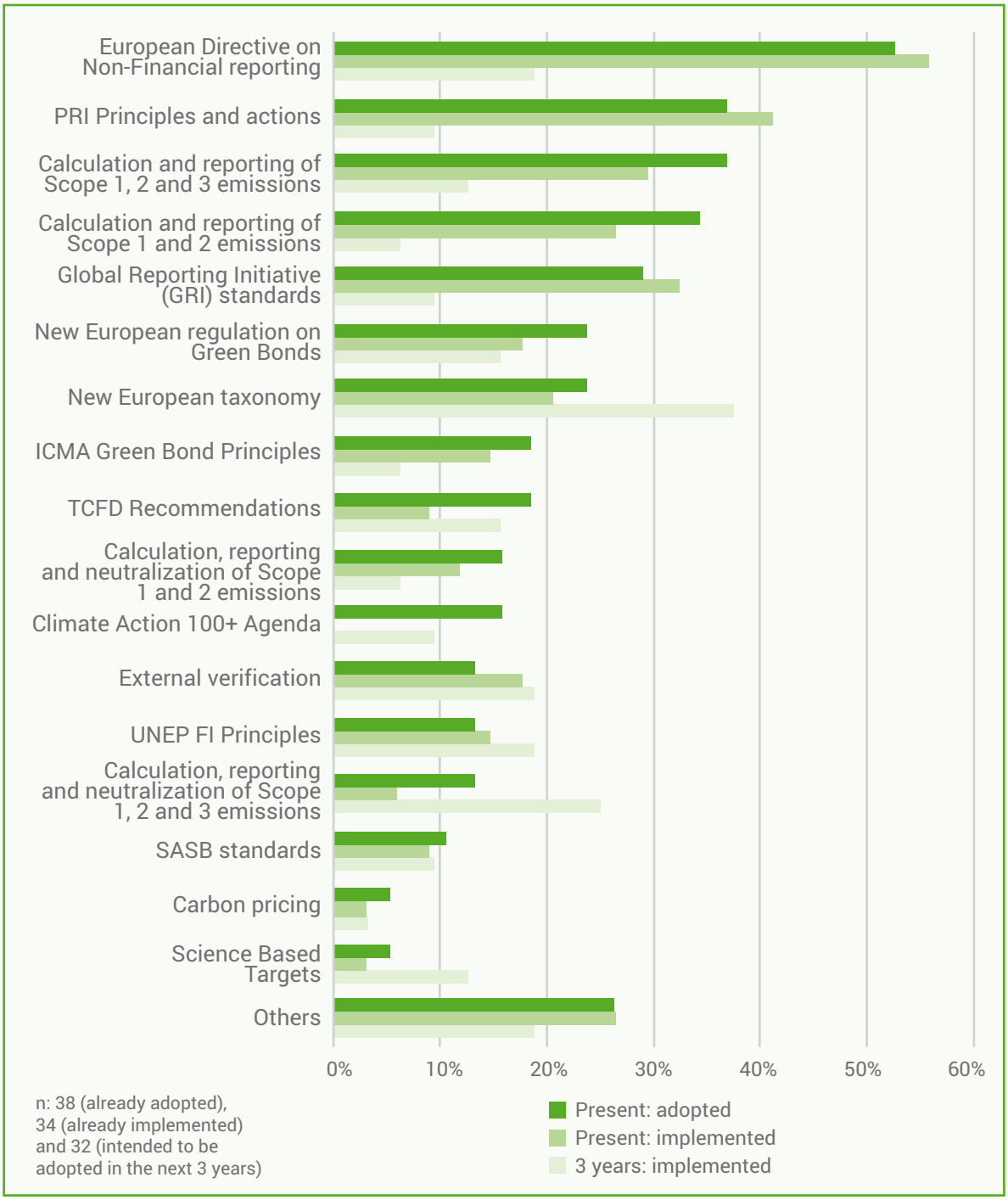
At the bottom, there are more complex or less-known instruments and initiatives such as Science Based Targets, carbon pricing, and SASB reporting standards.

It is important to note that non-profit organizations, unions and others have excluded themselves from these questions since they understood these questions did not apply to them, hence there was a lower level of response.

Considering the three-year future, the most important instrument (38%) and with an important difference from the current situation (24% implemented) would be the **new European taxonomy**, which also enjoys broad support on other issues. Another instrument that seems to evolve rapidly would be the calculation, reporting and neutralization of scope 1, 2 and 3 emissions, although once again it is surprising due to the difficulties of calculating scope 3 emissions and the neutralization of all emissions.

Results

7.1. The case of Europe



Since the early 2000s, with the **European Union Emissions Trading System** (EU ETS), Europe has led the development of regulations and initiatives related to climate investment and it shows to be the first continent aspiring to be climate neutral by 2050. There is a huge positive expectation – confirmed in this report – about the **new European legal framework**, especially on the **new taxonomy** belonging to the Action Plan on Sustainable Finance.

In 2014, the European Commission approved and published the **European Directive on the Disclosure of Non-Financial Information and Diversity Information by Large Companies**, highlighted in the survey, another example of Europe's leadership.

In 2016, the European Commission created a **High Level Expert Group on Sustainable Finance** (HLEG), made up of twenty high-level experts from civil society, the financial sector, academia and observers from European and international institutions. The Group published its final report in January of2018 where it presented eight priority actions that considers essential as for any significant measure related to sustainable finance. The recommendations of the group helped rise the Action Plan on Sustainable Finance, the new European taxonomy for the classification of sustainable activities, the European standard on green bonds and the climate benchmarks that will be reviewed below in this text. The group has also further recommended a guide for improving the disclosure of climate-related information[144].

In 2018, the European Commission created the Technical Experts Group on Sustainable Finance (TEG). The TEG, an evolution and extension of the HLEG, is composed of experts from finance, academia, civil society and industry, and is supported by nearly 200 selected experts[145].

In 2019 the EU unveiled its **European Green Dea**l that establishes an action plan to:

- promote efficient use of resources by turning to a clean and circular economy
- restore biodiversity and reduce pollution

The plan describes the investments required and the financing tools available. It explains how to ensure a **just and inclusive transition**.

The EU aspires to be climate neutral by 2050 and has proposed a European Climate Law that turns this political commitment into a legal obligation. Reaching this target will require action by all sectors of our economy, including:

- investing in environmentally-friendly technologies
- supporting industry to innovate
- rolling out cleaner, cheaper and healthier forms of private and public transport
- decarbonising the energy sector
- ensuring buildings are more energy efficient
- working with international partners to improve global environmental standards[146]

In recent months, Europe has published and adopted several initiatives that affect climate investment:

- **December 11, 2019**

Presentation of the European Green Deal[147]

- January 14, 2020

  Presentation of The European Green Deal Investment Plan and Just Transition Mechanism

- March 4, 2020

  Proposal for a European Climate Law for achieving the EU climate neutrality by 2050

  Public consultation about the European Climate Pact, that brings together regions, local communities, civil society, companies and schools

- March 10, 2020

  Adoption of the European Industrial Strategy, a plan for a future-ready economy

- July 8, 2020

  Adoption of EU strategies for hydrogen and energy system integration to pave the way towards a fully decarbonized, more efficient and interconnected energy sector

By June 2021, the Commission will also review and, if necessary, propose to review all relevant policy instruments to meet additional greenhouse gas emission reductions.

In early 2021, the Commission will adopt a new, more ambitious strategy on adaptation to climate change in order to consolidate measures for strengthening resilience to climate change, prevention and preparedness. At the same time, it will ensure that businesses, cities and citizens can integrate climate change into their risk management practices. A public consultation will inform about the conception of the new strategy[148].

- Action Plan for a greener and cleaner economy

The Commission has established a EU strategy on sustainable finance in which it sets out a roadmap on the continuation of work and future actions, **affecting all relevant actors in the financial system**. Among them, it is worth quoting:

- Establishing a common language for sustainable finance, i.e. a unified **EU classification system – or taxonomy** – to define what is sustainable and identify areas where sustainable investment can make the biggest impact.
- Creating **EU labels** for green financial products on the basis of this EU classification system: this will allow investors to easily identify investments that comply with green or low-carbon criteria.
- Clarifying the **duty of asset managers and institutional investors** to take sustainability into account in the investment process and enhance disclosure requirements.
- Requiring **insurance and investment firms to advise clients** on the basis of their preferences on sustainability.
- Incorporating **sustainability in prudential requirements**: banks and insurance companies are an important source of external finance for the European economy. The Commission will explore the feasibility of recalibrating capital requirements for banks (the so-called green supporting factor) for

sustainable investments, when it is justified from a risk perspective, while ensuring that financial stability is safeguarded.

- Enhancing transparency in **corporate reporting**: we propose to revise the guidelines on non-financial information to further align them with the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD)[149].

- **European taxonomy for the classification of environmentally sustainable activities**

On July 12, 2020, **Regulation (EU) 2020/852** came into force, defining a framework to facilitate sustainable investments[150], that is, the **European taxonomy of sustainable activities**[151], marking the last step in the process of adopting the political agreement reached by the co-legislators on December 17, 2019[152].

The regulation basically follows the recommendations of the Final Report on EU Taxonomy published on March 9, 2020 by the Group of Experts on Sustainable Finance, with a classification system, or taxonomy, valid for the entire EU, which will provide entrepreneurs and investors a common language to determine the economic activities that can be considered sustainable from an environmental point of view.

The taxonomy will allow investors to redirect their investments towards more sustainable activities, technologies and companies. It will be essential to let the EU be climate neutral between now and 2050 and to achieve the 2030 targets of the Paris Agreement, which include a 40% reduction in greenhouse gas emissions, for which the Commission estimates that the EU must cover **an investment deficit of approximately 180 billion euros a year**.

The future framework will be based on **six EU environmental objectives**:

1) **climate change mitigation**;

2) **climate change adaptation**;

3) sustainable use and protection of water and marine resources;

4) transition to a circular economy;

5) pollution prevention and control;

6) protection and restauration of biodiversity and ecosystems.

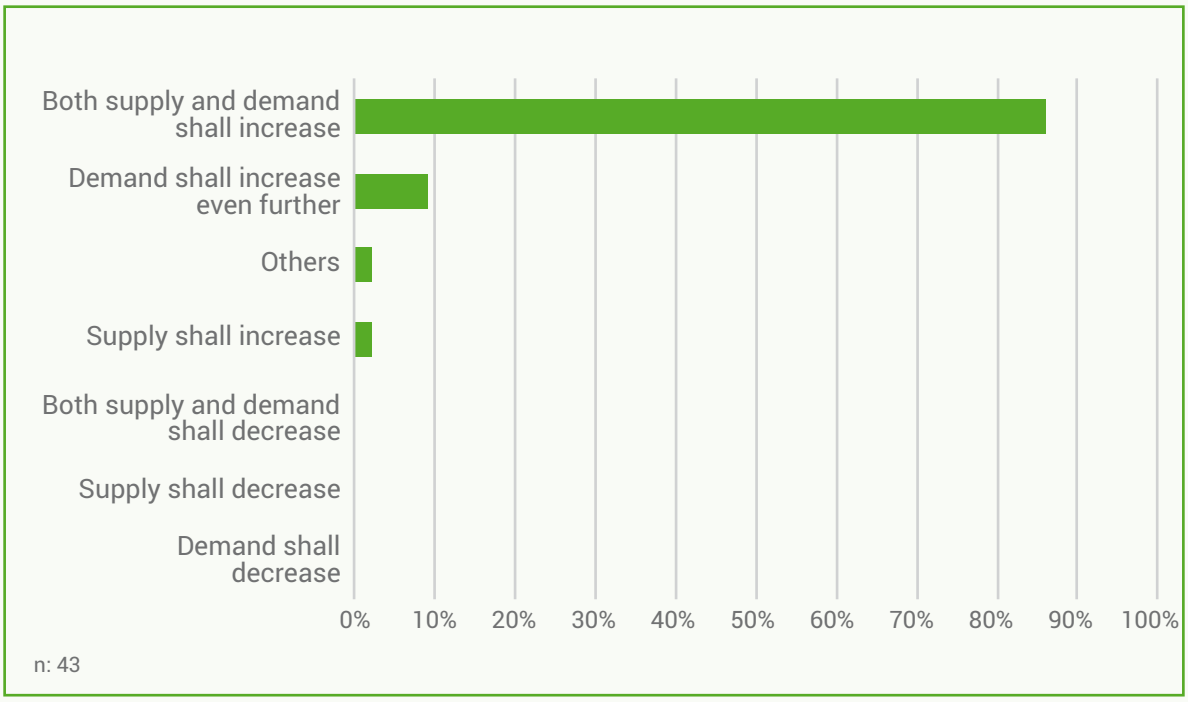
The taxonomy for climate change mitigation and climate change adaptation should be established by the end of 2020 in order to ensure its full application by end of 2021. For the four other objectives, the taxonomy should be established by the end of 2021 for application by the end of 2022[153].

Specifically, the taxonomy, as currently proposed, defines a classification system for environmentally sustainable activities – or from the climate point of view at the moment – and contains in its Technical Annex evaluation criteria **70 mitigation activities and 68 climate change adaptation activities**, including criteria for not causing significant harm to other environmental objectives[154]. The taxonomy is completed with an Excel tool to support users in the implementation of it in their activities[155].

SURVEY RESULTS

Question How will the new European legal framework, especially the new taxonomy, condition the supply and demand for climate finance in the next 10 years? Please select an option.

Results



Comments The most striking outcome of the survey has been the **extraordinary optimism** with the new European legal framework, especially the new taxonomy of sustainable finance: 86% of the respondents believe that they will condition the **increase in both supply and demand** of climate finance.

This optimism has surprised several interviewees that, despite being positive themselves, were struck by the fact that **the taxonomy is new, it does not cover other environmental aspects apart from climate change, much less social issues**. However, there is practically a consensus in that the taxonomy is robust and will be applied by all market players.

- Green Bond standard

As previously stated, Green Bonds play a relevant role, present and future, in financing the assets necessary for the transition to low carbon emissions. For this reason, the EU has proposed a European Green Bond Standard (EU GBS), a voluntary standard available to issuers who wish to align themselves with best practices in the market. The proposed standard, which was in public consultation at the time this research was conducted, is designed to be used and accessible by both EU issuers and issuers located outside the EU and it is based on the Principles of the Green Bonds (GBP)[156].

The proposed model sets out four core components:

(i) The alignment of the use-of-proceeds with the EU Taxonomy;

(ii) The content of a Green Bond Framework to be produced by the issuer;

(iii) The required Allocation and Impact Reporting; and

(iv) The requirements for external verification by an approved verifier[157].

- **Climate benchmarks:**

In the Sustainable Finance Action Plan, published in March 2018, the European Commission announced measures to improve the ESG (environmental, social and governance) transparency of the reference methodologies and an initiative to present standards for the methodology of the low carbon emissions benchmarks in the European Union, for the implementation of the action plan and the proposed **regulation on climate benchmarks**.

The definition of these climatic reference indices was evolving at the time of this research:

In May 2018, the Commission presented a proposal for a regulation creating two types of low-carbon benchmarks and requiring ESG disclosure requirements for the benchmarks. Following the legislative process, **Regulation (EU) 2019/2089** entered into force on April 30, 2020.

In September 2019, the TEG published its final report on climate benchmarks, followed by a guideline document published in December 2019.

According to the TEG final report, a **climate benchmark** is defined as an investment benchmark that incorporates – next to financial investment objectives - specific objectives related to greenhouse gas (GHG) emission reductions and the transition to a low-carbon economy - based on the scientific evidence of the IPCC - through the selection and weighting of underlying benchmark constituents.

A climate benchmark can serve as:

- Underlying for passive investment strategies;
- An investment performance benchmark for GHG emission-related strategies;
- An engagement tool;
- A policy benchmark to help guide strategic asset allocation (SAA)[158].

The report recommends a list of minimum standards for EU climate transition methodologies and benchmarks aligned with the Paris Agreement that address the risk of greenwashing, and disclosure requirements to improve transparency and comparability of information between benchmarks, not only with respect to climate-related information, but also on a variety of ESG indicators[159].

In April 2020, the Commission published the draft of delegated acts for public consultation. On July 17th of 2020, the European Commission adopted new rules establishing the minimum technical requirements for the EU climate benchmark methodology, which were under a period of scrutiny by the European Parliament and the Council[160].

7.2. GRI (Global Reporting Initiative) standards

The Global Reporting Initiative (**GRI**) created in 1997[161],is one of the pioneering initiatives in defining standards for reporting on sustainability, including climate change.

According to the initiative, GRI exists to help organizations be transparent and take responsibility for their impacts so that we can create a sustainable future. GRI seeks to create a global common language – through an independent multi-stakeholder process – for organizations to report their impacts[162].

In 2016, GRI went from providing guidelines to establishing the first global standards for sustainability reporting: the **GRI standards**[163], adopted by thousands of companies around the world and, as indicated in this report, the most used also in Spain.

The GRI standards create a common, crosscutting language for organizations, large or small, private or public, to report on their impacts on sustainability in a consistent and credible way. This improves global comparability and enables organizations to be transparent and accountable. These standards help organizations understand and disclose their impacts in a way that meets the needs of multiple stakeholders. In addition to reporting companies, standards are of great relevance to many other groups, including investors, policy makers, capital markets, and civil society.[164]

The GRI standards are designed as a modular set, starting with the universal standards:

- GRI 101 – Foundation
- GRI 102 – General Disclosures
- GRI 103 – Management Approach

Next, the thematic standards are selected, depending on the **material themes** of the organization: economic (Series 200), environmental (Series 300) or social (Series 400). Examples:

- GRI 201 – Economic Performance
- GRI 202 – Market Presence
- GRI 207 – Tax
- GRI 301 – Materials
- GRI 302 – Energy
- **GRI 305 – Emissions** – including greenhouse gas (GHG) emissions
- GRI 308 – Supplier Environmental Assesment
- GRI 401 – Employment
- GRI 419 – Socioeconomic Compliance[165]

7.3. The Non-Financial Reporting Directive (NFRD)

For more than a decade, large companies or those committed companies have published their annual reports on "corporate social responsibility", "corporate responsibility" and more recently on "sustainability", as an extension to previous environmental reports or systems. However, this information has been disorganized: In addition to the large number of terms and the absence of standards – partially resolved by the Global Reporting Initiative (GRI) standards – these reports were almost always voluntary[166], although already required by various investors.

In 2014, the disclosure of information on the sustainability of companies, or "non-financial" reporting, became mandatory throughout Europe, at least for approximately 6,000 large companies, with the European **Directive 2014/95/EU on Disclosure of Non-Financial and Diversity Information**,[167] definitively transposed in Spain by **Law 11/2018** of December 28, 2018[168].

The Spanish transposition determined a structure for the company or group report identical to that required by the European directive: definition of the business model, policies, results of these policies, risks and indicators. However, Law 11/2018 is somewhat more ambitious in terms of minimum content, including measures to prevent, reduce or repair carbon emissions and the important elements of greenhouse gas emissions generated as a result of the activities of the business, including the use of the goods and services it produces; the measures taken to adapt to the consequences of climate change; the reduction goals established voluntarily in the medium and long term to reduce greenhouse gas emissions and the means implemented for this purpose. In addition, the Spanish transposition requires a **verification** of the reported information[169].

The European Directive has subsequently been supplemented by two non-binding guidelines:

- Guidelines on non-financial reporting (methodology for reporting non-financial information)[170]
- Guidelines on non-financial reporting: Supplement on reporting climate-related information[171]

In 2019, on the basis of the TEG's proposals, the Commission developed new guidelines on non-financial reporting: **Supplement on reporting climate-related information**[172].

The guidelines on the reporting of climate-related information are a complement to the (non-binding) guidelines on non-financial information published by the Commission in 2017. They are consistent with the requirements of the Directive on non-financial information and also **integrate the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD)**. They provide guidance to companies on how to report the impacts of their business on the climate and the impacts of climate change on their business – a concept that is known as **double materiality**[173].

Directive 2014/95 is in review process in line with the Communication on the European Green Deal, when the Commission committed to revise it as part of the strategy to strengthen the foundations of sustainable investment. A number of 588 organizations and individuals submitted a response to the public consultation process between February and June 2020, supporting very strongly (82%) the use of a common standard and strongly issues such as expanding the scope of the directive (up to 72%), standards simplified for SMEs (74%), use of European taxonomy (69%), more stringent audit requirements (67%), more transparency in materiality processes (74%) and others[174]. The European Commission is expected to adopt a new regulation in the last quarter of 2020[175].

7.4. Recommendations of the Task Force on Climate related Financial Disclosures (TCFD)

In 2015, Mark Carney, in his role as chair of the Financial Stability Board, established an industry-led task force, the **Task Force on Climate related Financial Disclosures (TCFD)**, to identify the information needed by investors, lenders and insurers, assess and measure climate-related risks and opportunities.

Chaired by Michael Bloomberg, TCFD members represented the private sector, including banks, insurance companies, asset managers, pension funds, large corporations, accounting and consulting firms, and credit rating agencies. Recommendations for climate-related financial disclosure were based on members' experience, in addition to stakeholder involvement and existing climate-related disclosure frameworks and standards.

In 2017, the TCFD released its final report that included **four core elements** with eleven recommended disclosures on climate-related disclosures, designed to be applicable to organizations in different sectors and jurisdictions.

Core Elements of Recommended Climate-Related Financial Disclosures

- **Gobernance**. The organization's governance around climate-related risks and opportunities.
- **Strategy**. The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.
- **Risk Management**. The processes used by the organization to identify, assess, and manage climate-related risks.
- **Metrics and Targets**. The metrics and targets used to assess and manage relevant climate-related risks and opportunities[176].

Mark Carney is clearly optimistic about the TCFD's recommendations: "The momentum behind TCFD's voluntary disclosure recommendation is creating a virtuous circle by encouraging learning by doing. As companies apply the recommendations and investors differentiate between firms using better information, adoption will continue to spread, disclosure will become more decision-useful, and its impact will grow"[177].

The practical impact of the TCFD's recommendations is difficult to measure, but its supporters currently manage nearly **$ 110 trillion in assets**[178]. For example, ***BlackRock*** requires the companies in which they invest to report their climate risks in accordance with the recommendations of the TCFD[179].

7.5. The Social Accountability Standards Board (SASB)

The Social Accountability Standards Board (SASB) is a non-profit organization, founded in 2011 to develop sustainability accounting standards.

SASB standards are available, since 2018, for 77 industries in the following 11 sectors:

- Consumer goods
- Extractives & Mineral Processing
- Financials

- Food & Beverage
- Health Care
- Infrastructure
- Renewable Resources & Alternative Energy
- Resource Transformation
- Services
- Technology & Communications
- Transportation[180].

While the standards of the Global Reporting Initiative (GRI) are not focused on any specific group of stakeholders, they are global and let the reporting company choose the material topics to report, **SASB is focused on the investors' needs, especially Noth American ones, and determines what the material issues are** for each of the 77 industries. Climate risks are often present in virtually in the 77 standards, but not all.

Despite the differences, in July 2020, SASB and GRI announced a new collaboration – to "promote clarity and compatibility in the sustainability landscape"[181].

In his aforementioned annual letter to CEOs of participating companies in January 2020, Larry Fink, CEO of ***BlackRock***, writes: "This year, we are asking the companies that we invest in on behalf of our clients to: publish a disclosure in line with industry-specific SASB guidelines by year-end, if you have not already done so, or disclose a similar set of data in a way that is relevant to your particular business"[182].

7.6. Science Based Targets

The Science Based Targets initiative (SBTi) advocates setting science-based targets as a "powerful way of boosting companies' competitive advantage in the transition to the low-carbon economy". It is a collaboration between CDP, the United Nations Global Compact (UNGC), World Resources Institute (WRI) and the World Wildlife Fund (WWF) and one of the commitments of the We Mean Business Coalition commitments[183].

According to the SBTi, targets adopted by companies to reduce greenhouse gas (GHG) emissions are considered "science-based" if they are **in line with what the latest climate science says** it is necessary to meet the goals of the Paris Agreement – to limit global warming to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C[184].

Currently, 972 companies have committed to calculating their science-based targets, but less than the half, 454 companies, have them approved by SBTi. In Spain, 27 companies have committed to the initiative, but only 12 have their objectives approved, including the pioneering Logista (2°C), Ferrovial (2°C), Red Eléctrica (2°C) and the most recent and, per SBTi requirement, more daring: Siemens Gamesa (1.5°C) and Inditex (1.5°C).

7.7. Climate Action 100+

Launched in December 2017 at the One Planet Summit in Paris, Climate Action 100+ is an initiative of more than 450 investors, such as CaixaBank AM, Caja Ingenieros Gestión, Groupama AM, in addition to VidaCaixa, also in Spain, with more than 40 trillion dollars in assets under management, to ensure that the world's largest corporate emitters of greenhouse gases take the necessary measures on climate change[185].

It is one of the most innovative and successful initiatives. As said by *The Economist* magazine, thanks to Climate Action 100+, "Investors concerned about climate change have never been better organizeds"[186].

The signatories have agreed on a common engagement agenda that seeks commitments from boards and senior management to:[187]

1. **Governance**: implement a strong governance framework that clearly articulates the board's accountability and oversight of climate change risks and opportunities.
2. **Action**: take action to reduce GHG emissions across the value chain, consistent with the Paris Agreement goal of limiting global average temperature increase to well below 2°C above pre industrial levels.
3. **Disclosure**: provide enhanced corporate disclosure in line with the final recommendations of the Task Force on Climate related Financial Disclosures (TCFD) and, when applicable, sector specific Global Investor Coalition on Climate Change (GIC) Investor Expectations on Climate Change guidelines to enable investors to assess the robustness of companies' business plans against a range of climate scenarios, including well below 2°C, and improve investment decision making.

By supporting this high level agenda, investors are identifying and communicating with companies on more detailed company specific expectations.

Their actual work is done through a combination of public letters, formal and informal conversations with company management, and the filing of **shareholder resolutions** – investor action proposals that are voted on by the entire shareholder base at the company's annual general meeting. Individual investors take responsibility for coordinating action with respect to a particular company by creating a coalition of company investors to push for change[188].

The target companies include 100 "**systemically important emitters**", accounting for two-thirds of annual global industrial emission, such as Naturgy and Repsol in Spain, alongside with more than 60 others with **significant opportunity to drive the clean energy transition**, like the Spanish case of Iberdrola[189].

Among the 161 companies targeted by Climate Action 100+, 70% have set scope 1 emissions targets. But only 9% have set target that a research group called the Transition Path Initiative considers compatible with the objective of keeping global temperature below 2ºC above pre-industrial levels. An equally small proportion has pledged not to push harder against green regulation than Climate Action 100+ calls for[190]. On the other hand, the initiative has managed to get large oil companies such as Shell to establish short-term objectives and BP to report the carbon intensity of their products, the method-

ology they use to consider climate impacts in their new investments and the company's plans to define and measure emission targets[191].

7.8. Network for Greening the Financial System

At the One Planet Summit in Paris in December 2017, eight central banks and supervisors established the Network of Central Banks and Supervisors for Greening the Financial System (NGFS). Since then, the Network's membership has grown considerably on all five continents. On July 24, 2020, the NGFS consisted of 69 members, including the **Bank of Spain**, and 13 observers[192].

The purpose of the NGFS is to help **strengthening the global response required to meet the goals of the Paris Agreement and to enhance the role of the financial system to manage risks and to mobilize capital for green and low-carbon investments** in the broader context of environmentally sustainable development. To this end, the Network defines and promotes best practices to be implemented within and outside of the Membership of the NGFS and conducts or commissions analytical work on green finance[193].

7.9. Trends

Beyond the application of the regulatory framework and the global and European initiatives of the last decade, the following trends can be observed:

1. **Growth of climate awareness**: the latest popular survey by the European Investment Bank (EIB) indicates:
   - 90% of Europeans believe their children will feel the consequences of climate change in their everyday lives; and
   - 33% of Europeans believe they will have to move to a colder or warmer region or country because of climate change.

   And in a practical way:

   - 70% of Europeans have already switched to a green energy provider or would be willing to do so[194].
2. **Increased demand for transparency and concern about "greenwashing"**: the expansion of markets, new instruments – especially green bonds – and the growth of invested volumes begins to attract more attention from the media, think tanks, NGOs and especially regulators and investors, whose main concern is the greenwashing of a company that wants to appear more "green" than it actually is[195] or a green bond that may include investments in non-green sectors to some, such as oil[196] or that is the result of a "fashion trend"[197]. European regulators – as indicated above – and others, are already taking measures such as the requirement of reporting non-financial information by large companies, the creation of the European taxonomy, the new European green bond standard, and others. Finally, some investors, activist shareholders and initiatives such as Cli-

mate Action 100+, begin to name companies that do not comply with their climate commitments: BlackRock, published a report naming 53 companies in this situation[198].

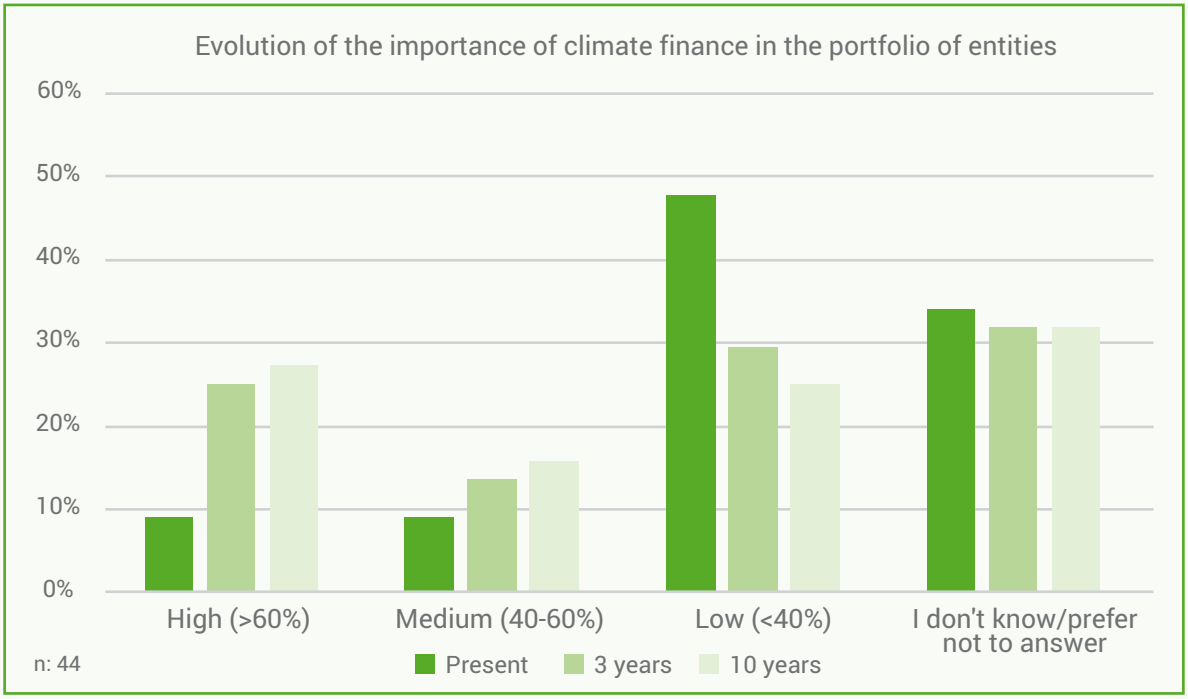
3. **Growth in the importance of regulators** in addition to the developments discussed in this report, others are coming, such as climate stress tests for bankss[199] and the revision of the MiFID II Directive to include questions about customer preferences regarding ESG issues, including climate change, with effect as early as 2021[200].
4. **European carbon credit trading markets** (EU ETS) have suffered price variations not linked to supply and demand, especially with the announcement of the green recovery plan, although if prices vary too much Europe can intervene[201].
5. **New sovereign green bond issues**: Germany has finalized its first green bond issue: € 6 billion over 10 years[202], Spain continues to show signs[203] that it will issue its inaugural green bond before the end of the year and, more importantly, Europe seems to want to use this instrument – with issues of the order of hundreds of billions of euros – to finance green recovery.

8. EVOLUTION OF INVESTMENT ALLOCATION

SURVEY RESULTS

Question What is the importance, currently, in the next 3 years and in the next 10 years, of climate investments in your portfolio (or in the market if your entity is not an operator)? Please select one option.

Results



Comments The results of the survey show the **growing importance of climate investments**. Currently this type of investment is low (<40% of the portfolio) for almost half (48%) of those who have estimated the importance, however, the "Low" category decreases rapidly in the next 3 years to 30% and it would continue to decline, although at a slower rate, to 25% in 10 years. On the other hand, the high proportion (> 60%) of climate investments also rises rapidly in the next 3 years, from 9% to 25% and then to 27% in the next 10 years.

Another remarkable result is that a third of the respondents have consistently indicated that they do not know or prefer not to answer the question. Indeed, and as indicated in the answers to other questions, there is a general ignorance of climate investment and for many entities it is really difficult to predict its importance or they prefer not to mean themselves about it so as not to reveal their next investment movements.

Green bonds are the main climate investment instrument. Its evolution is surprising: According to the Climate Bonds Initiative, in 2019 there were 1,802 green bond issues with a **record total volume of 259,000 million dollars** (2018: USD 171,000 million):

Top 3 Sustainable Finance Trends in 2019:

1. Introducing green finance into the financial system, investor and regulatory responses to climate change
2. The continued rise of a broader range of SDG-related debt labels (e.g. sustainability bonds, social bonds) and ESG-linked credit
3. Additional work on harmonization and standardization of the market

Outlook for the second half of 2020-2021:

1. Green bond growth expected from financial institutions, sovereigns and climate-aligned issuers
2. Greater use of other labels (e.g. sustainability and social bonds), especially in light of COVID-19, as well as performance-linked instruments (e.g. KPI-linked lines of credit) to facilitate transition
3. Increased focus on transitioning from "brown" or "gray" sectors, such as aviation, steel, chemicals, and cement
4. Harmonization of taxonomies, especially around the EU taxonomy, green bond guidelines and disclosure
5. Growth of certification as the Climate Bonds standard expands its scope and more recurring issuers adopt programmatic certification[204]

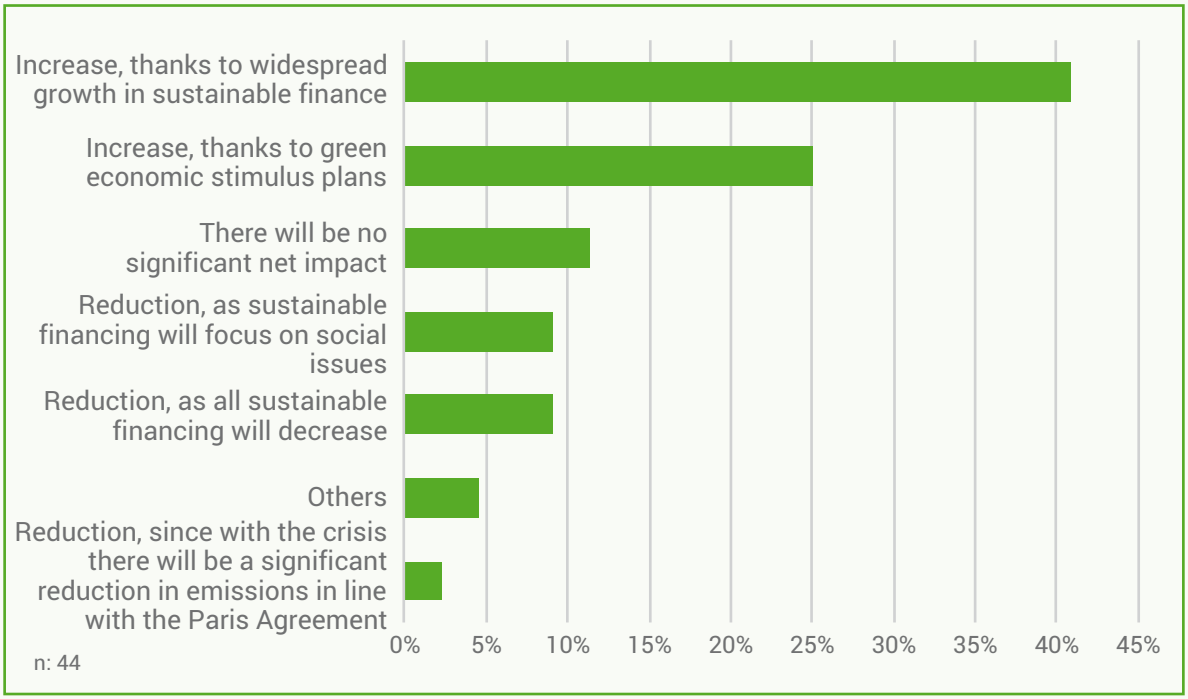
9. COVID-19: THE NEW NORMALITY AND THE GREEN RECOVERY

The health crisis of COVID-19 and its social, environmental and economic consequences have surprised everyone in Spain and in the world precisely during the preparation of this report, in which a final question has been added about its impacts on climate finance.

SURVEY RESULTS

Question What will be the impact of the COVID-19 crisis on climate finance in the next three years? Please select an option.

Results



Comments Another unambiguous outcome of the research has been the evident optimism with the positive impact of the COVID-19 crisis on the growth of climate finance. Exactly two-thirds (66%) of those surveyed believe that there will be growth, either due to the widespread growth of sustainable financing (41%) or thanks to green economic stimulus plans (25%). However, it should not be under-estimated that 20% think there will be a decrease, for one reason or another.

The possible "excess" of optimism has surprised some interviewees since it would be early to draw conclusions and specially to make forecasts. However, the growth of sustainable finance during the first months of the COVID-19 crisis, although more pronounced on the social side, and Europe's initial response to maintain the Green Deal and incorporate climate requirements into reconstruction plans, they can fuel this optimism and finally confirm investments.

An example is the ***Next Generation EU***, a new recovery instrument endowed with 750 billion euros, which will be added to the EU budget with new financing obtained in the financial markets during the period 2021-2024 and which seeks to support the ecological transition towards a climate-neutral economy[205].

10. ACCELERATING INVESTMENTS IN CLIMATE ACTION: FINAL RECOMMENDATIONS

Based on the bibliographic review, surveys and interviews carried out, it can be said that climate change, its physical and transition risks, is an increasing concern for the financial sector, at the same time that there is a growth in climate investments through new financial instruments such as sustainable and green bonds.

Institutional investors and regulators – especially the European Union – have the main roles to play and there is clear optimism because of the new European legal framework, especially about the taxonomy. This optimism is also manifested in the growth trend of climate investments despite – or as a consequence – of the COVID-19 crisis.

The following recommendations from this research – especially from the interviews – stand out:

- **Approve and stabilize better (smart) regulation**: Europe and finally Spain seem to be on the right track with modern regulation that is already causing an increase of confidence in the markets. In Spain, the approval of the Climate Change and Energy Transition Law is urgent and, furthermore, as suggested by one respondent, "*a national agreement must be reached to ensure stability in the long-term applicable legal regulations*". Based on the responses received, "*The financial sector requires an intelligent, useful and implementable regulatory framework in an easy and agile way. For this, it is essential to have a sufficiently granular and extensive standardized database, as well as publicly accessible. Both requirements (regulation and data) would allow the financial sector to redirect financial flows towards sustainable economic activities*".

- **Standardize reporting and metrics**: Standardization of reporting plays a key role in increasing climate investments, since it will allow the unification of criteria and the comparison of data. As one respondent indicates: "*Research from the MIT Sloan School of Management shows that ESG scores from different rating agencies are aligned only 60% of the time. The Economist has also examined the issue recently and concludes that, unlike credit ratings, the various ESG standards are poorly correlated with each other: rating agencies do not agree on which companies are good or bad*". Another respondent reiterates: "*The homogenization of indicators and metrics related to climate change are key to advancing on the decarbonization path.*" On the other hand, the proliferation of demands for information must be avoided[206]. Kristalina Georgieva, managing director of the IMF, concerned with "greenwashing", expressed *"standardization and classification of what constitutes sustainable and green is necessary for the industry to prosper"*[207].

- **Improve transparency**: Applying the information available, as well as establishing control and verification mechanisms for this is one of the relevant issues that have been identified in this research.

In the words of one respondent, "*The fact that a taxonomy has been defined does not mean that the investments are truly sustainable, unless it has been thoroughly verified, or rigorous measures have been established to adjust the criteria in case the result is not the expected*". Another respondent fully suggests: "*Measurement of portfolio impacts and transparency on them, measurement of exposure to financial risks associated with climate change and transparency on them, integration of ESG in management and business as usual, definition of portfolio decarbonization commitment, inclusion of climate risks in the risk model and in the stress tests*". In this sense, it is recommended to consider the establishment of a mandatory carbon footprint registry for large companies or emitters, reinforcing the current voluntary system.

- **Increase awareness and training**: carrying out campaigns or initiatives that make it possible to publish the scope of the climate emergency, as well as the effects it has on financial risks and the market mechanisms available to act, can generate an increase in the amount and the quality of investments with positive impacts.

- **Establishing the necessary mechanisms to guarantee a just transition and reinforcing the presence of social and governance aspects in investments:** "green" investments and projects must also consider social and governance aspects[208], so that they are finally "sustainable" or at least considering a just transition, or "not causing significant damage" to other environmental aspects, as defined by the new taxonomy of Europe.

- **Accelerating investments in adaptation**: this report shows that there are opportunities in both mitigation and adaptation, but this perception does not automatically turn into public and private investments in mitigation: in 2017-2018 for example, only 5% of all public and private investments was intended for adaptation projects[209]. This increase must occur throughout the world, including in less developed countries[210].

Finally, it is interesting to note that some of these recommendations coincide with several recent studies such as the PRI institutional investor's guide, which recommends to:

- Consider developing new funds and products.
- Bolster integration into core processes.
- Engage with clients and potential investors on demand and needs.
- Build internal expertise.
- Bolster reporting metrics[211].

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CREDITS

Spainsif is a not-for-profit association made up of entities interested in promoting Sustainable and Responsible Investment in Spain, creating a platform in which financial entities, asset managers, SRI service providers, non-profit organizations linked to SRI are integrated and trade unions, currently made up of 88 associates.

The association aims to be a meeting and reference platform to generate and spread knowledge about Sustainable and Responsible Investment (SRI) as well as raise awareness and promote changes in investment processes in the investment community, Public Administrations, companies and citizens usually.

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Project supervisor:

Dr. Francisco Javier Garayoa Arruti, Managing Director, Spainsif

Project director:

Marcio Viegas, Founder and Managing Director, SUST4IN

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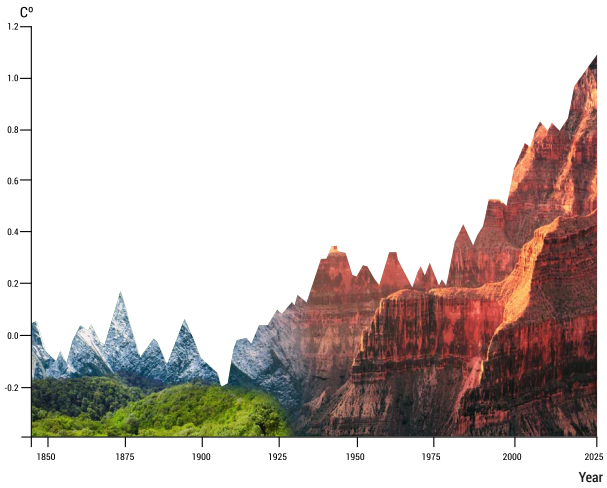

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