



BANCA D'ITALIA
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Questioni di Economia e Finanza

(Occasional Papers)

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by Ivan Faiella and Danila Malvolti

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THE CLIMATE RISK FOR FINANCE IN ITALY

by Ivan Faiella* and Danila Malvolti°

Abstract

The increasing attention paid to the possible consequences of climate change for the financial sector has strengthened international cooperation on green finance, with initiatives from both the industry and the institutions. International surveys show that so far there has been no adequate growth in awareness of the risks linked to climate change and the opportunities linked to the transition towards a low carbon economy. Evidence acquired on Climate-Related Financial Risk (CRFR) disclosure in Italy has confirmed the same conclusions. We have therefore identified three steps with the aim of encouraging financial institutions to take CRFR into account in their corporate risk management strategies: 1) create a information hub to gather the information required for assessing the CRFR; 2) compile a list of the information not yet available; 3) define standard methodologies that allow the climate scenarios to be part of the decision-making processes of financial institutions.

JEL Classification: G21, P48, Q54.

Keywords: climate change, financial risk, Italy.

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*THE CLIMATE RISK FOR FINANCE IN ITALY **

Report of Working Group 3 of the Italian Observatory on Sustainable Finance

EXECUTIVE SUMMARY

The increasing attention paid to the possible consequences of climate change for the financial sector has strengthened international cooperation on green finance, with initiatives from both the industry and the institutions.

Among the main steps taken in this direction, the following are particularly worth mentioning: the institution of the Task Force on Climate-related financial disclosure (TCFD) by the Financial Stability Board (FSB) in 2015, the establishment of the Green Finance Study Group (GFSG) within the framework of the G20 and the institution of the High Level Expert Group on sustainable finance (HLEG) by the European Commission in 2016.

The HLEG Report formed the basis for the European Commission's Action Plan for Financing Sustainable Growth and the subsequent package of measures for implementing several of the key actions announced in the Action Plan for Sustainable Finance, among which defining a common taxonomy of sustainable investment is particularly important. Finally, in December 2017 the Network for Greening the Financial System (NGFS) was established, promoted by a group of central banks and supervisory authorities. The Network has the task of promoting the sharing of experiences and best practices concerning the management of risks linked to the environment and climate change in the financial sector.

These initiatives have led to a unanimous consensus on the opportunity to raise awareness of the risks arising from climate change in the financial system. Indeed, the first report published in October 2018 by the Prudential Regulation Authority (PRA) on climate risk for the United Kingdom banking system and the report published in September 2018 by the TCFD on the application of the recommendations set out in the TCFD final report show that so far there has been no adequate growth in awareness of the risks linked to climate change and the opportunities linked to the transition towards a low carbon economy. Considerable efforts still need to be made. In particular, the assessment of the impact of climate change on the financial system is still hampered by the poor information available and the difficulty in conceptualizing how environmental impacts - and policies to mitigate them - are transmitted to the real economy and the financial system.

Evidence acquired from the questionnaire on CLIMATE-RELATED FINANCIAL RISK (CRFR) DISCLOSURE IN ITALY, prepared by our working group, has confirmed the same conclusions, highlighting the concrete need, on the part of companies and investors, to achieve a more comprehensive understanding of the potential financial consequences associated with climate change.

Our survey brought to light the difficulties of economic operators. These difficulties are actually a

stimulus to continue public-private joint actions aimed at increasing the awareness and transparency of the CRFR for Italian finance.

*Our Working Group has therefore identified **three steps** that would help to improve the identification of CRFR, with the aim of encouraging financial institutions to take CRFR into account in their corporate risk management strategies:*

- 1. Create a **Climate Information Hub (CIH)** to gather the information required for assessing the CRFR;*
- 2. Compile a list of the information that is needed but not yet available for correct CRFR assessment, and initiate activities - in cooperation with the research community - to fill this **Climate Information Gap (CIG)**;*
- 3. Define methodologies that allow the climate scenarios to be part of the decision-making processes of financial institutions and, for this purpose, to identify **typical climate scenarios (TCS)**.*

* The report has benefited from the contribution of all the members of the Working Group 3 of the Italian Observatory on Sustainable Finance (listed in Appendix 1). The report was edited by Ivan Faiella (Bank of Italy, chapters 1, 2, 4, 6 and 7) and Danila Malvolti (Ministry of Economy and Finance, chapters 3 and 5).

1. INTRODUCTION

The climate is changing in Italy too, and this is having and will continue to have a significant impact on economic activities through various channels: from the increase in the frequency and intensity of extreme weather events to the effects of higher temperatures (droughts and with lower agricultural production, more extensive fires, decreased labour productivity and increased morbidity).

Data up until October 2018 have shown that 2018 was the hottest year in the entire historical series prepared by the Italian Institute for Environmental Protection and Research (ISPRA) since 1961 (+1.77°C compared with the average for the years 1961-1990) and based on studies that reconstruct the history of climate in the distant past, it was also the hottest year in at least the last two centuries.¹ The year 2017 was characterised by a worsening of climate conditions, with significant droughts in most of Italy and serious consequences for water resources (average accumulated precipitation was almost a quarter lower than normal). In summer 2017, the absolute maximum temperature reached record values several times (ISPRA, 2018).

The expected effects of these changes over the entire European continent are having a profound impact on the economies and on people's welfare, especially in southern countries such as Italy. In southern Europe, the heat wave-related mortality rate is more likely to increase, as well as the scarcity of water resources and the loss of habitats; moreover, these areas are also more subject to increases in energy demand for air conditioning and in the frequency and intensity of forest fires (Box 1). In particular, Italy is the European country that will suffer the greatest damage from river floods.²

BOX 1 - Climate change in Europe

The PESETA project, coordinated by the Joint Research Centre, provides a holistic assessment of the future physical and economic impacts of climate change in Europe in the 2071- 2100 period. According to the latest report,³ climate change will produce a wide range of environmental and socio-economic impacts throughout Europe. Rising temperatures will result in a reduction in labour productivity. Changes in the plant growing and flowering seasons and in the water content of soil will affect the productivity of agriculture and the suitability of habitats for hosting life forms. The demand for energy for heating will decrease, but that for cooling will increase rapidly. The reduced availability of water due to changes in precipitation could interrupt the supply of energy and reduce potential hydroelectric energy production. The southern regions of Europe may have to face increasing water shortages.

Many impacts on society and the environment will be due to the changes in climate extremes. An increase is expected in flood risk in many regions. Especially in the second half of this century, the rise in sea level, will see a drastic increase in coastal floods along most of Europe's coasts. Flooding will mean that transport and other critical infrastructures located on the flood plains and near the sea are more and more subject to damage and disruption.

Drought events will become more frequent and intense, especially in southern Europe, and will increase the risk of forest fires. Human heat wave-related mortality will increase greatly.

¹ ISPRA press release of 9 November 2018 (http://www.isprambiente.gov.it/files2018/area-stampa/comunicati-stampa/comunicato_stampa_clima_2018.pdf).

² According to the latest PESETA project report, in all the scenarios considered, Italy is the country that will suffer the greatest damage from the worsening of floods linked to river floods (see Figure 4 of the 'Climate impacts in Europe' report mentioned in the subsequent note).

³ Ciscar J.C., Feyen L., Ibarreta D. and Soria A. (coordinators) (2018), "Climate impacts in Europe. Final report of the JRC PESETA III project", Science for Policy report by the Joint Research Centre.

These environmental phenomena together with climate change mitigation policies may affect the real economy and consequently also the financial system in various ways. For example, the greater intensity of natural events may damage fixed assets (buildings and machinery) and reduce the ability of creditors in the affected areas to honour their commitments with banks (this is called **physical risk**). Moreover, some of the decisions made in defining energy and climate policies (like the one recently adopted with the approval of the latest national energy strategy⁴, i.e. the decision to abandon the use of coal for electricity generation) may have an impact on the value of the assets of the companies involved (**transition risk**).

This report first describes the link between climate change and financial risks (Section 2), then illustrates the initiatives taken to understand the link between climate risk and the financial system at international level (Section 3) and at Italian level (Section 4). It also analyses in-depth the recommendations made by the TCFD in the *Final report recommendations of the Task Force on Climate-related Financial Disclosures* of June 2017 (Section 5); this report was the starting point for the questionnaire that this Working Group created and sent to Italian financial system operators and whose responses are commented in Section 6. Based on the evidence found, some possible steps to be undertaken by market operators and the competent authorities are proposed (Final Considerations).

⁴ The document that describes Italy's National Energy Strategy is available at https://www.sviluppoeconomico.gov.it/images/stories/documenti/testo_della_StrategiaEnergeticaNazionale_2017.pdf.

2. THE LINK BETWEEN CLIMATE CHANGE AND FINANCIAL RISKS

The limited capacity of the atmosphere to absorb further greenhouse gas emissions and the consequent increase in temperature has led to an increase in the frequency and intensity of environmental disasters such as floods, landslides, fires, droughts, high temperatures and so on. However, climate change mitigation policies may have an influence on the use and the cost of fossil fuels. Each of these factors may affect the financial system, which may be exposed to different types of climate risk (*Climate-Related Financial Risk*, hereinafter CRFR)⁵ that have not yet been fully captured and assessed by the current financial models.

The first is **physical risk**, with effects on economic entities exposed to extreme natural events. For example, environmental disasters may destroy the physical capital (houses, industrial warehouses and plants, and public or private service facilities), therefore forcing households, businesses and both local and central public bodies to allocate financial resources to reconstruction. Such a diversion of resources has, among other things, the effect of increasing debt, thus squeezing the resources available for consumption and investment and aggravating the possible compression of income generation determined by the physical damage (e.g. due to production being interrupted or to not being able to use strategic infrastructure).

These effects may spread to the financial sector through different channels: natural disasters not only interrupt the activities of companies and households (increasing their financial vulnerability), but also contribute to reducing the value of the assets pledged for loans. Repaying loans may therefore become more complex due to the aforementioned diversion of resources for restoring damaged property or assets. Environmental shocks may increase the number of non-performing loans in the portfolio of banks that are particularly exposed to households or businesses in the areas most at risk; this could induce banks to restrict the supply of credit, which would potentially affect the effectiveness of the credit channel of monetary policy. Moreover, if these effects were on a large scaled, this would threaten the stability of the financial system as a whole.

Figure 1, from Batten et al. (2016), shows the mechanisms for propagating physical risk to the financial system.

If those affected by natural disasters were insured (red rectangles), the effects might weigh on the financial situation of the insurance companies exposed, with these effects increasing as the severity of the damage increases (such as the fires in California in 2018 or Hurricane Katrina in the USA in 2006). A deterioration in the financial position of insurance companies could in turn affect financial stability if they stopped providing certain services or the value of their securities abruptly decreased, thus negatively affecting the situation of other financial institutions that hold them in their portfolio (e.g. banks or institutional investors). If the frequency and severity of these events were underestimated,⁶ as well as the worsening of the situation over time due to climate change effects that increase the temporal and spatial correlation (clustering effects), these phenomena would become even more serious.

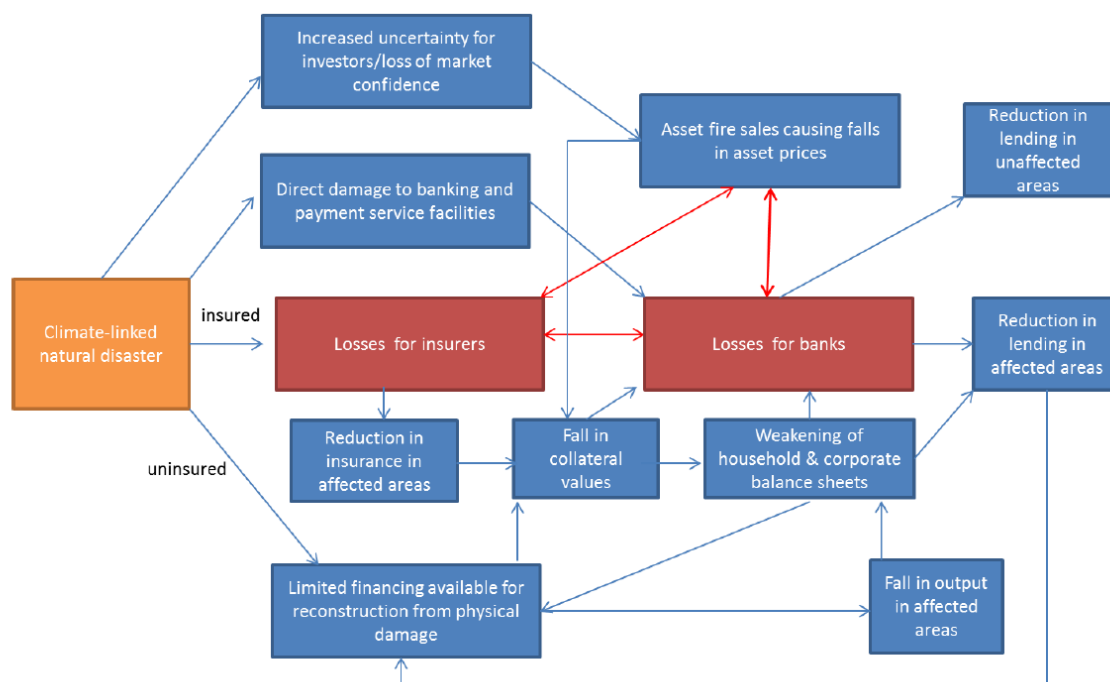
If the damaged infrastructures are not covered by insurance, the effects of natural events take away more resources from the people involved and may lead to a more significant reduction in the

⁵ The classification used here is that of the UK Prudential Regulation Authority (2015), 'The impact of climate change on the UK insurance sector', the Bank of England.

⁶ According to a recent report by the Dutch Central Bank, insurance premiums in the Netherlands do not properly reflect the increase in flood risk caused by climate change, and the models used to assess the extent of these events are often contracted out to external advisory companies, without insurance companies having detailed knowledge of their operating mechanisms (Regelink et al. 2017).

value of the collateral pledged for credit. In turn, a reduction in the value of collateral, associated with an increase in the financial vulnerability of households and businesses affected, could increase both the possibility of default (PD) and the amount of the loss that the bank must bear in case of a borrower's default;⁷ if the affected area were large or the event particularly intense, these effects could propagate through the whole banking system (Figure 1 and Table 1).

Figure 1. Effects of a natural disaster on the financial system



Source: Batten et al. (2016).

A second risk arises from the commitments made by the international community with the aim of stabilizing the atmospheric concentration of greenhouse gases at a level that allows the increase in temperature to be kept below 2°C and to continue with the efforts to limit this increase to below 1.5°C compared with pre-industrial levels. A non-regulated transition towards a low carbon economy could sharply reduce the value of energy reserves and of the infrastructure for their exploitation and for processing and using fossil fuels (coal, oil and gas). Unlike physical risk, this **transition risk** is not persistent but could disrupt the stability of the financial system. In fact, given the importance of the energy sectors, a sudden drop in the value of reserves and related infrastructures could trigger a race to sell the securities of energy companies, with consequences that could permanently affect the path to global economic growth (as happened with financial companies exposed to the sub-prime loan sector during the last great financial crisis that led to the Great Recession). Moreover, the transition could be inflationary, because climate policies may require the use of alternative energy sources that are currently more expensive, or the introduction of carbon pricing systems that affect prices and economic activities (e.g. the imposition of a carbon tax,⁸ designed to grow over time in line with the growth in goals to reduce emissions, such as carbon neutrality, which will be necessary from 2050 to limit the increase in temperatures to below 1.5°C). Finally, since the demand for energy is inelastic in the short-medium term, a sharp increase in energy

⁷ The overall expected loss for each borrower (*Expected Loss* - EL) is given by the product of the Possible Default (PD) loss that the bank must bear in the event of a borrower's default on a loan (Loss Given Default - LGD) and the value of the outstanding loans at the time of default (Exposure At Default - EAD).

⁸ Faiella and Cingano (2015) discuss a carbon tax proposal for the transport sector in Italy.

prices would increase the financial vulnerability of businesses and households due to their higher expenditure on the purchase of energy goods.⁹

As an example of how climate policy may affect the economics of the energy sector and in turn, transition risk, we can recall the Italian commitment to phase out coal by 2025, as outlined by the National Energy Strategy adopted at the end of 2017 and as confirmed in the draft of the National Energy and Climate plan sent to the EU Commission at the end of 2018. If this change is not managed by the actors involved in an orderly way and is not embedded in the expectations of market operators, it might affect the value of the companies involved in the coal supply chain (see Box 3), and if it also modifies the cost generation structure, it might also impact the wholesale market price formation mechanism (coal energy generation costs are among the lowest due to the low cost of the raw material on the international markets and the low values of the environmental penalty linked to EU ETS prices).

Finally, there is the **liability risk**, which is typical of the insurance sector. It materializes, for example, when those suffering damage due to phenomena induced by climate change pass it on to those whose business is taking on these kinds of risks, i.e. insurance companies.

Table 1 - Examples of CRFR for Italian banks

	Credit risk	Market risk
Physical risk	<ul style="list-style-type: none"> - Extreme weather events affect the production of businesses / households and make them more vulnerable in financial terms, reducing their capacity to repay their debts. - Extreme weather events affect the value of the guarantees of indebted businesses / households. 	<ul style="list-style-type: none"> - Losses resulting from the value of the bank's property (houses, land, etc.) being reduced by extreme weather events caused by the climate. - Losses resulting from a reduction in the value of bank portfolio securities issued by companies whose performance is affected by the material effects of climate change.
Transition risk	<ul style="list-style-type: none"> - Difficulties for businesses whose future performance is influenced by climate change policies (e.g. coal generating companies, energy-intensive companies in the oil and gas sector, companies for which the costs of energy products or the availability of specific fossil energy sources are essential to the production process). 	<ul style="list-style-type: none"> - Losses resulting from the reduction in value of bank portfolio securities issued by companies whose future performances are influenced by climate change policies (e.g. companies generating electricity using coal , energy-intensive companies and companies in the oil and gas sector).
Systemic Risk	<ul style="list-style-type: none"> If the effects (especially those of the transition risk) affect a whole sector (construction, energy production and distribution, agriculture, etc.), the risk arises of spill-over effects on the whole financial system (shareholders, debenture holders, creditors). 	

There is no estimate of the overall size of these risks, but some of them have been assessed in individual studies. Dietz et al. (2016) used a VaR model to estimate the physical risks linked to climate change in the absence of mitigation measures additional to the expected ones (BAU scenario): the financial assets exposed would be in the range of \$2,500 to \$24,200 billion. Mercure et al. (2018) estimated that the potential losses of activities linked to fossil fuels extraction, use, processing and transportation, amount to \$1,000 - \$4,000 billion. Finally, Battiston et al. (2017) found that the amount of banks' loans to highly carbon-intensive sectors (exposed to greater transition risk) is higher than their total capital.

The box below shows four examples of studies on CRFR for Italy: the first investigated physical risk by analysing whether loans to businesses change according to the level of flood risk in the different areas of the country; the second investigated transition risk by examining the influence

⁹ On the importance of firms' energy expenditure, see Faiella I. and A. Mistretta (2015), "Spesa energetica e competitività delle imprese italiane", *Economia Pubblica*, n. 3, pp. 85-122; for households, see Faiella I. and L. Lavecchia (2015), "La povertà energetica in Italia", *Politica Economica*, n. 1, pp. 27-76.

of the carbon intensity of the electric mix on the equity value of major electricity generating companies in Europe; the third investigated physical risk from an insurance point of view; and the fourth showed how the extent of carbon intensity and its evolution can be used to identify the sectors that are most exposed to transition risk.

BOX 2 - Physical risk: environmental risk and the bank channel for corporate loans

As previously described, extreme meteorological events may constitute a source of financial risk: the higher frequency and intensity of natural events (such as floods and landslides) mean economic losses for households and businesses, with potential repercussions for the financial system. In the event of these phenomena increasing in their intensity as a consequence of climate change, the bond between bank lending to businesses and environmental shocks could increase the share of bad loans in banks' portfolios; an increase in the environmental risk could therefore lead to a restriction in lending to those companies that are most exposed to physical risk.

A study on Italy¹⁰ combines information on lending to businesses with information on flood risk at municipal level. On examining the municipalities with a greater share of businesses with a high flood risk level (HIF-High-Impact Flooding) it emerges that:

1. At the end of 2014, over one fifth (€162 billion, one tenth of the Italian GDP) of the total of bank loans to businesses (€776 billion) was intended for businesses located in HIF municipalities.
2. The regions at greatest risk are Emilia Romagna, Tuscany, Veneto and Liguria, and the sectors most exposed are construction, wholesale and retail trade and real estate.
3. A multivariate analysis showed a negative association between the amount of loans and the flood risk exposure of businesses (a risk defined as the percentage of businesses exposed to greater risk), which at provincial is higher for SMEs.

¹⁰ Faiella I. and F. Natoli (2018), "Natural catastrophes and bank lending: the case of flood risk in Italy", *Questioni di Economia e Finanza (Occasional Papers)* n. 457, October, Bank of Italy.

BOX 3 - Transition risk: investments in electricity sector utilities

The profound process of change triggered in recent years by the introduction of increasingly binding goals for the reduction of greenhouse gas emissions has particularly involved the electricity generation businesses, making obsolete their conventional business model in which generation relied mainly on fossil fuels.

A recent work¹¹ has analysed the impact of carbon risk on the returns on equity of European energy utilities. The main results of this study are the following:

1. The drop in demand for energy and the decarbonization process have exerted a downward pressure on revenues and prices, in particular for businesses with an energy mix more oriented to fossil sources; for these businesses, the recomposition of the energy mix required by decarbonization policies has also led to write-downs of the most carbon-intensive assets, which further weighed on the operating results by biting into equity and increasing the financial leverage. This is also a consequence of the strong support that the electricity sector's renewable energy has enjoyed in many countries.

2. Although the electrical sector utilities represent a moderate value in the Eurozone stock markets, institutional investors are considerably exposed to their capital and debt, also due to their high flow of dividends and relatively limited sensitivity to market movements (beta), which makes these shares similar to fixed-income instruments. If the process of transition towards a low-carbon system were faster than the market expected, then the risks for those investors could be significant.

3. Portfolio allocation strategies that take into account the carbon intensity of these businesses could help to reduce the transition phase risks and to seize opportunities for efficiency. The analyses carried out, based on factorial models for risk premium measurement and referring to the most recent years, have shown the presence of a wide and statistically significant Low-Carbon Premium, especially since the decarbonisation process has been faster since 2012.

¹¹ Bernardini E., Di Giampaolo J., Faiella I. and Poli R. (2019), "The impact of carbon risk on stock returns: Evidence from the European electric utilities, *Journal of Sustainable Finance & Investment*, N.26.

BOX 4 - Catastrophe risks and the insurance sector in Italy

Over the past fifty years Italy has experienced many natural disasters and ten devastating earthquakes, from Belice to central Italy, with extremely high costs in terms of human lives, rescue activities, material repairs and interventions on the ground.

The risk, however, is not uniform across the different areas of the country; many areas have a low exposure to these risks and therefore insurance premiums only calculated on the basis of risk are very variable (from one to ten in the case of earthquakes). This gives rise to an apparent paradox : those who live in low risk areas may not feel the need to buy an insurance policy, but if they decide to do so, they usually pay a very low premium; by contrast, those who live in areas at risk and feel the need for insurance coverage, are discouraged by the high premiums. Moreover, people's awareness of these risks is extremely low: although 55 per cent of Italian households have a high level of hydrogeological risk exposure, about 83 per cent of them do not believe or do not know they are exposed to catastrophe risk (GFK Eurisko survey for ANIA - 2017).

In order to evaluate the options for extending insurance coverage to this type of event, insurance systems may be classified according to three factors: degree of state regulation of the sector; level of the mandatory requirement for having insurance coverage and degree of risk sharing (mutuality) on the part of the insured. Using these factors, the world can be divided into two groups:

- ✓ The group of countries in which the State has a limited role in the matter and insurance coverage is voluntary (e.g. the United Kingdom, Japan and the United States). In these systems, the premium is correlated with the risk level;
- ✓ The group of countries in which the State has a broader role and therefore insurance coverage is to some extent compulsory (e.g. France, Turkey, Chile and New Zealand). In these countries the premiums are established by law and, with the exception of Turkey, are not differentiated by risk.

In Italy, natural disaster damage is usually managed by the State in the reconstruction phase. This partly explains the poor diffusion of insurance coverage for these events (this is usually linked to fire insurance as an add-on cover option of), which is also attributable to the low propensity of Italians to buy non-mandatory insurance cover.

In the first months of 2017, IVASS, the Italian insurance supervisory authority, conducted a survey of all the insurance companies that as of 30 September 2016 provided insurance coverage against fire for residential units located in Italy. These companies reported the main characteristics of individual policies, including any add-on cover option for earthquake and flood damage (known as *Catnat*).

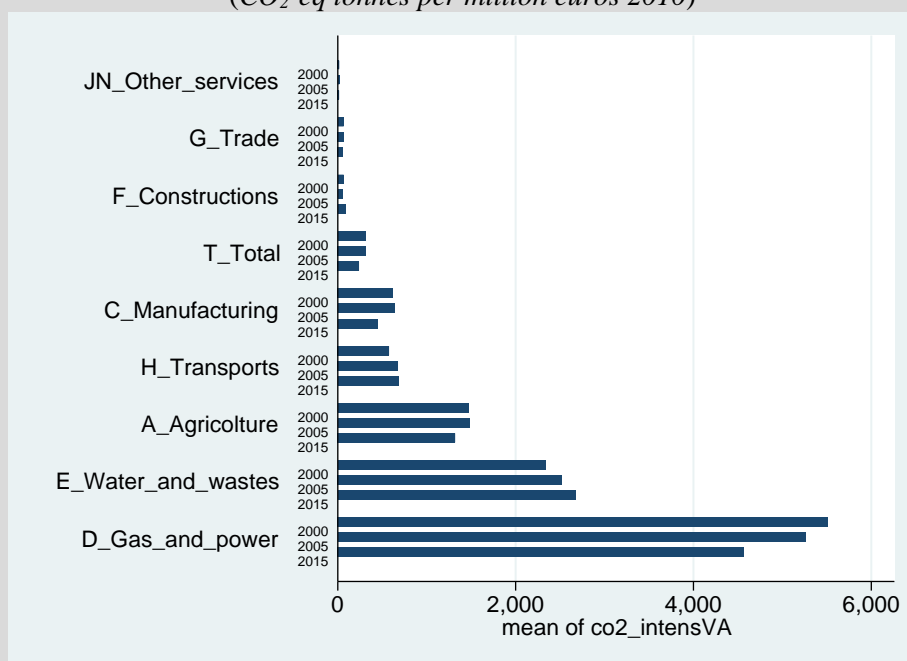
The survey showed that more than 12 million households (35 per cent of the total) were covered by insurance policies for fires, but that the diffusion of coverage against earthquake and flood damage (*Catnat*) on residential units is low. Only 2.4 per cent of houses have some form of insurance coverage. Of these, 1.7 per cent are covered against earthquakes and the same amount against floods. The 2018 Budget Law introduced a new deduction for insurance premiums covering the risk of natural disasters - earthquakes, floods and landslides. For insurance policies taken out since 1 January 2018, the insured no longer have to pay the 22.5 per cent tax and can benefit from a tax deduction equal to 19 per cent of the premium paid.

BOX 5 - Sectoral carbon intensity in Italy

The transition risk is greater for those financial operators that are mainly exposed to the most carbon-intensive sectors, which could be more vulnerable to the tightening up of climate policies. Carbon intensity, i.e. the amount of greenhouse gas emissions associated with the value added unit generation of a sector, can be used as a proxy indicator for sectors at greater risk. According to the statistics on emissions prepared by ISTAT, the Italian statistics authority,¹² the energy sectors (electricity and gas) are the ones most exposed to the transition risk, together with those of water and waste management, agriculture and transport (Figure A).

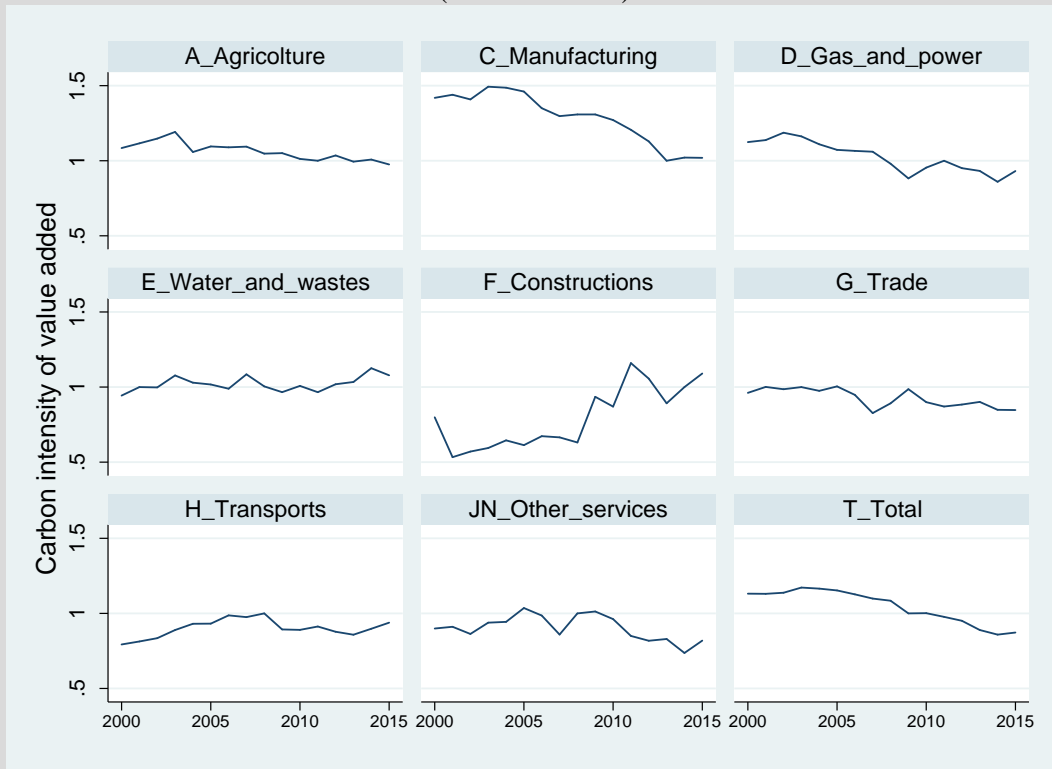
In terms of trends, carbon dioxide intensity has decreased over the last twenty years, with dynamics differentiated by sector: water and waste management as well as construction and transport sectors have recorded an increase in their carbon intensity, in agriculture it has remained substantially unchanged whereas in the other sectors it has decreased (figure B).

Figure A. Carbon intensity of value added
(CO₂-eq tonnes per million euros 2010)



¹² ISTAT regularly produces the data for the NAMEA satellite account (*National accounting matrix including environmental accounts*) that reports the estimates on atmospheric pollutant emissions and emission intensity by economic activity and household consumption type.

Figure B. Carbon intensity trend
(index: 2000=1)



3. THE INTERNATIONAL CONTEXT

The fight against climate change effects has had a remarkable boost, especially since 2015. In that year, in fact, ambitious targets to reduce greenhouse gas emission were set according to the Paris Agreement on climate change¹³ and to the United Nations 2030 Global Development Agenda Sustainable Development Goals (SDG No.13 ‘Climate Action, Take urgent action to combat climate change and its impacts’).¹⁴ At the beginning of October 2018, the new Report of the Intergovernmental Panel on Climate Change (IPCC) was finally presented; this is the scientific body that collects the main studies on climate change.¹⁵ According to this document, if CO₂ emissions remain at the current pace, by 2030 the mean global temperature will increase by more than 1.5°C, which is the maximum safety threshold for being able to control and manage the effects, according to what was defined at the COP 21 in Paris. The UN Conference on Climate Change (COP 24) held in December 2018 in Katowice reiterated the need for progress in the implementation of the Paris Agreement, to keep the increase in the average global temperature below 1.5°C, by arranging a series of technical standards to ensure the entry into force of the Agreement in 2020. With the long term strategy ‘A clean planet for all’,¹⁶ published in November 2018, the European Commission set out its vision for a future characterized by carbon neutrality, to be attained by 2050.

These initiatives have placed at the centre of the global economic and financial debate the need to understand and clearly define the steps to outline the path of transition towards a sustainable economy that is able to reshape the global economy in the decades to come. This path must combine economic, social and environmental sustainability considerations in the framework of a financial policy aimed at mobilizing and directing private capital toward green investments, while supporting economic growth and the creation of new jobs.

In such a context, the sustainability of the financial sector is crucial and therefore developing financial reporting that correctly takes into account climate hazards is essential in order to properly identify and quantify the financial sector’s exposure to companies operating in high carbon intensity sectors or with low resilience to climate change. Moreover, new business opportunities will arise from these evaluations because of the demand for products on the part of investors, business partners and clients.

The growing awareness of climate change’s consequences for the financial sector has favoured the intensification of international cooperation, which has benefited from several contributions from the industry and the institutions, at EU and international level.

Market initiatives include the Sustainable Banking Network (SBN) promoted by the International Finance Corporation (IFC) for emerging countries, the Inquiry for Sustainable Finance and The Finance Initiative promoted by the UN Environment Program (UNEP). In particular, the SBN has established the ‘SBN Measurement Working Group’ for measuring sustainable finance, with the aim of creating technical guidelines, by harmonizing some indicators, for assessing the effectiveness of green finance policies. The UNEP’s 2017 Inquiry and the World Bank’s Roadmap for a Sustainable Financial System¹⁷ both aim to create a financial system which also takes account

¹³ Available at: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

¹⁴ Available at: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

¹⁵ <https://www.ipcc.ch/sr15/>

¹⁶ Available at: https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf

¹⁷ The Road Map recommended various steps: the creation of a common taxonomy for sustainable finance; the alignment of climate reporting with the recommendations of the Financial Stability Board’s Task Force; the improvement of climate phenomena-related skills and knowledge in the financial sector; the inclusion of

of positive and negative externalities with strategies for re-orienting the flow of resources towards more inclusive and sustainable activities.

There were numerous **institutional initiatives in international forums**. Within the G20, in 2017, the Green Finance Study Group (GFSG)¹⁸ produced a series of recommendations for mobilizing private capital toward green investments and encouraging and facilitating the sharing of knowledge on environmental and financial risks. Other important initiatives have been undertaken in the OECD Center on Green Finance and Investment (CGFI).¹⁹ In 2015, the Financial Stability Board created the Task Force on Climate-related Financial Disclosures (TCFD) for studying climate change-related financial risks and raising awareness of climate-related risks for both financial and non-financial institutions, as well as fostering the channelling of financial flows to support a low carbon economy.²⁰

As regards insurance, in July 2018 the International Association of Insurance Supervisors (IAIS), which brings together the insurance supervisors of more than 200 organizations in 140 countries representing 97 per cent of the global production of the insurance sector, together with the UNEP and the Sustainable Insurance Forum, finalized an Issue Paper on Climate Change Risks to the Insurance Sector, to which many supervisors contributed by describing their national experiences. This document provides an overview of how climate change is influencing and may affect the insurance sector both in the present and the future; it provides examples of current material risks and impacts in all subscription and investment activities, and describes how these risks may be significant for the supervision and regulation of the sector. The Issue Paper specifically investigates the applicability of the Insurance Core Principles (ICP) - i.e. a set of principles, standards and guidelines developed at international level as the basic reference point for Insurance Supervisory Authorities to exercise effective supervision - to climate change, describing the supervisory practices adopted in various countries; lastly, it proposes a framework for identifying, assessing and managing natural disaster-related risks.

At European level, in March 2018, as an integral part of the overall EU sustainable finance strategy, the European Commission launched an Action Plan aimed at outlining a sustainable financial strategy for the EU based on two imperatives/requirements: improving the contribution of finance to sustainable and inclusive growth by financing the long-term needs of the society; and consolidating financial stability by integrating environmental, social and governance (ESG) factors in the decision-making processes on investments.

The Action Plan aims at: redirecting capital flows toward sustainable investments in order to achieve sustainable and inclusive growth; managing financial risks deriving from climate change, the depletion of resources, environmental degradation and social issues; and promoting transparency

climate risk in the mission of financial supervision authorities; greater collaboration between the financial sector and the competent authorities; and the use of new technologies to enable smart solutions for the climate. The Roadmap also includes specific recommendations for the core activities of banks, insurance companies and investors.

<http://documents.worldbank.org/curated/en/903601510548466486/Roadmap-for-a-sustainable-financial-system>.

¹⁸ The report is available at:

http://unepinquiry.org/wp-content/uploads/2017/07/2017_GFSG_Synthesis_Report_EN.pdf

¹⁹ The detailed work programme is available at: <http://www.oecd.org/cgfi/>

²⁰ A key objective of the TCFD is to further raise awareness of climate change-related financial risks, in order to: (i) improve the decisions of agents when they invest, deliver credit, or trade insurance products (a 'micro' assessment); and (ii) allow those who participate in the financial markets to better understand the financial system's exposure to climate-related risks (a 'macro' assessment).

and a long-term vision in economic-financial activities.

Following the Action Plan of March 2018, on 24 May, the European Commission issued three Proposals for Regulations²¹ with the aim of defining a European financial system that supports the transition towards a low-carbon economy and the sustainable development of the EU.²²

The new regulatory framework is intended to adapt the financial system to the environmental challenges and risks linked to climate change and to encourage private capital flows towards sustainable investments. Adaptation to climate risks is supported by guidelines for improving information disclosure and comparability levels. The channelling of investment towards sustainable activities requires a new classification system (**taxonomy**) for sustainable investments at European level, the inclusion of economic, social and governance factors both in investment decisions and financial operators' advisory processes, the integration - by financial operators - of sustainability preferences in client suitability tests and the verification that customer needs are satisfied by the products supplied. It is also necessary to develop a new category of reference indexes for projects with a low carbon emission impact in order to enable investors interested in low carbon emission strategies to compare the performance of their investments in a uniform and coherent way. The Commission has provided for constant monitoring of the Action Plan's progress. In July 2018, the Technical Expert Group on Sustainable Finance (TEG) published an initial report on the progress achieved in the implementation of the Commission's Action Plan.²³

²¹The details of the new EU regulatory framework are available at: https://ec.europa.eu/info/publications/180524-proposal-sustainable-finance_it and https://ec.europa.eu/info/publications/180308-action-plan-sustainable-growth_en.

²² The three Proposals for Regulations aim to define a context in which sustainability factors are the core of the financial system (COM 353/2018), regulate transparent information on sustainable risks (COM 354/2018), allow investors to compare investments using two new categories of low carbon benchmarks (COM 355/2018).

²³ The first TEG report is available at: https://ec.europa.eu/info/sites/info/files/180730-teg-statement_en.pdf

4. THE ITALIAN CONTEXT

In recent years, a series of initiatives have been implemented at national level as well to better understand how the issues linked to sustainable development (and in particular to climate change effects) can influence economic activity and thus affect financial operators.

The initiatives launched with the Dialogo per la Finanza Sostenibile (National Dialogue on Sustainable Finance) and the establishment of the Osservatorio Italiano per la Finanza Sostenibile (Italian Observatory on Sustainable Finance) have been added to those for improving how businesses report the non-financial impacts of their activities and other proposals aimed at improving how CRFR is understood.

4.1. The establishment of the Italian Observatory on Sustainable Finance

In Italy, the first initiative focused on sustainable finance was in 2016, when the Ministry of the Environment, Land and Sea (Ministero dell'Ambiente e della Tutela del Territorio e del Mare - MATTM), with the support of UNEP-FI (a partnership between the United Nations Environment Program and some representatives of the financial world) launched the National Dialogue on Sustainable Finance with major representatives from the Italian financial world. The main output of this project was the Report of the Italian National Dialogue on Sustainable Finance, which was issued at the beginning of 2017.

To follow up the work begun with the Dialogue and in order to promote and coordinate the actions proposed in the Report, at the beginning of 2018, the MATTM established the Italian Observatory on Sustainable Finance, whose activities are divided among four working groups.²⁴ The third working group (hereinafter WG3) has the task of analysing the effects that the various international initiatives may have on those operating in the financial markets in Italy (banks, insurance companies, financial analysts and advisors, and institutional investors) focusing on CRFR. In concrete terms, the WG3's objective is to study and assess (i) the situation of financial operators with reference to CRFR disclosure and management and how TCFD recommendations and GFSG guidelines should be used to ensure that this type of risk in its various forms (physical, transition, responsibility risk) becomes an integral part of the risk management and communication process; and (ii) how the specific features of the Italian financial system should shape future developments in this area, with a particular focus on the European context. To achieve this objective, WG3 prepared a questionnaire that was then administered to financial system operators in order to discover their level of awareness of CRFR and its disclosure, and to understand which of the related issues are the most important for Italy's financial industry. This questionnaire is essentially based on the TCFD's recommendations; therefore, section 5 focuses on its main findings.

Other initiatives related to the need to improve knowledge of CRFR concern the availability of information on the environmental impact of businesses.

²⁴ The first group studies the feasibility of establishing a 'green financial centre' that can activate initiatives, tools and products for green finance. Group 2 deals with the re-industrialization of the Italian economy through green finance. Group 3 analyses the evolution of international green finance initiatives and their implications in the national context. Group 4 has the task of assessing the implementation status of the proposals and recommendations of the report on sustainable finance in Italy. The observatory was repealed in December 2019.

4.2. The collection of information and the role of the Non-financial Declaration (Dichiarazione non finanziaria, DNF)

One of the main obstacles to taking greater account of these issues lies in the **lack of organic and homogeneous data**. In order to bridge this gap and improve the understanding of the connection between environmental factors (and in general non-economic and non-financial factors) and business activities, Legislative Decree 254/2016 was enacted, which implements Directive (EU) 2014/95 of the European Parliament and of the Council of 22 October 2014. In 2017, the first year of implementation, submission of a Non-financial Declaration (DNF is the Italian acronym) was required of public-interest entities that during the financial year have more than 500 employees on average, and whose consolidated financial statement met at least one of the following two criteria: 1) total assets on the balance sheet exceeding €20 million; and 2) total net revenues from sales and services exceeding €40 million.

The Non-financial Declaration must contain elements that help understand the impact of a company's activity, covering environmental and social issues regarding personnel, respect for human rights, and the fight against bribery and corruption that are important when taking account of the activities and characteristics of the company. The company is required to describe at least 'the main risks, generated or suffered, connected to the above-mentioned issues and resulting from the activities, products, services or commercial relations of the company, including, where relevant, supply and subcontracting chains', and (Article 3(2), letter c) to give information on 'the impact on the environment and people's health and safety, as associated with the risk factors referred to in paragraph 1, letter (c), or to other significant environmental or health risk factors; this, where possible, on the basis of assumptions or realistic scenarios, even medium-term ones'. Specifically, the Non-financial Declaration must set out the risks generated and suffered in the various areas of reference for direct activities, products, trade policies and - where relevant - supply and subcontracting relationships. Companies are required to make specific reference to their use of energy resources - distinguishing between energy from renewable sources and from other sources - and their use of water resources, and to provide information on emissions of greenhouse gases and other pollutants. The relevant information must always be selected for each company based on the **materiality principle**, and therefore based on an analysis of the specific characteristics of each company; information must be provided only to the extent that it is significant in light of the activities carried out by the company and its characteristics and therefore, on which social and environmental aspects it can have a significant impact. In practice, however, for the first Non-financial Declarations, it was difficult for companies to find and systematize the information required, and this discrepancy will also make it complex to use this information for an overall analysis of the link between economic activity and environmental issues. For this reason, there have been several initiatives to assist operators in compiling the Non-financial Declaration. The banking sector and the ABI, together with the insurance industry with ANIA, have intensified pre-existing initiatives in this field (see Boxes 6 and 7).

Moreover, a Joint Declaration promoted by ANIA and ABI is currently being defined that will favour the energy and seismic redevelopment of residential property. Based on what is already in place in other European countries, the banking and insurance sectors have undertaken to promote the improvement of the energy and environmental aspects of historical buildings by offering suitable financial/insurance products and training/information initiatives. The MoU, in addition to promoting the adoption of financial/insurance facilities for those who wish to enhance their property in terms of resilience and energy efficiency, intends to set up some concrete support for improving of the

urban context's resilience to climate change and to collect systemic data that can contribute to the understanding and knowledge of climate change-related risks.

BOX 6 - Non-financial reporting and ESG risk management: the activities of the banks and the ABI

As part of the works promoted by the ABI (Italian Banking Association) on non-financial information reporting and ESG issues management, guidelines were published in 2018 arising from the reflections, exchanges of ideas and sharing of experiences in this field between banks and external experts, and giving an idea of the situation when every bank had to make choices for publishing their first Non-financial Declaration, regardless of their possible previous experience in sustainability reporting (Busco and Tanno, 2018). Experience has revealed the need to expand the obligation to provide information on risks. These are the premises on which the project 'La gestione dei rischi connessi ai temi di sostenibilità nell'ambito della Dichiarazione di carattere non finanziario' (Sustainability-related risk management in the framework of the Non-financial Declaration) was based. The CSR/Sustainability functions and in general those in charge of the Non-financial Declaration, expressed the need to dialogue with risk managers and alert corporate management to the connection between risk management and the ESG variables that must be assessed by law.

This project, promoted by the ABI with the support and participation of some banks, takes into account the works carried out on sustainable finance at both European and national level; it includes the analysis of the first Non-financial Declarations, aimed at analysing the approach adopted by national and European operators in respecting the national laws transposing Directive (EU) 2014/95. The project also investigates in depth the approach adopted for managing the requirements of the Decree regarding risks, together with main parties involved (CSR / Risk Managers of banks, Opinion Leaders and Best Practices) The goal is to continue to support the banks in their non-financial reporting and to raise the banking sector operators' awareness of these issues.

In addition, the ABI has contributed with the EBF to drafting the document 'Toward a Green Finance framework', with the help of the inter-bank working group BACC (Banche, ambiente e cambiamenti climatici - Banks, environment and climate change) coordinated by the Ufficio Rischi, Controlli e Sostenibilità (Risk, controls and sustainability office). This group acts as an interface with the Technical Expert Group of the European Commission for the Plan on Sustainable Finance, thus contributing to the various consultation procedures relating to this Plan, and focuses on the integration of ESG risks into the banks' risk management of banks and prudential regulation. It also participates in the working groups of the Italian Observatory on Sustainable Finance coordinated by the Ministry of the Environment, Land and Sea (MATTM) and works in close connection with the Osservatorio Banche e Green Economy (Banks and Green Economy Observatory) managed by ABI's Credit Office and ABILab.

BOX 7 - ANIA's initiatives for improving the comparability of Non-financial Declarations

ANIA has launched a three-year project for the comparison of the mandatory and voluntary Non-financial Declarations published by Italian and European insurance companies. This initiative is unique in the sector and is made up of two phases. First, information will be collected and the best practices in place will be assessed with reference to the reporting standards used; after that, a benchmark analysis will be conducted and, if possible, homogeneous clusters of companies/groups will be defined at national and international level, also based on auditing firms' opinions. In particular, the main key performance indicators provided will be assessed and compared, such as: Diversity & Inclusion; Human Resources Development; Value Creation; Responsible Asset Management (with a focus, where possible, on reporting investments' ESG impact, and so on); Sustainable Products Portfolio; Health, Safety and the Environment (e.g. direct greenhouse gas emissions, indirect greenhouse gas emissions, and so on). Finally, an analytical report will be drafted to be discussed with businesses participating in the project, shared with the competent Supervisory Authority (CONSOB) and with other stakeholders concerned (Supervisory Authorities, ASSIREVI, and so on).

4.3. Other initiatives for collecting information on CRFR

Alongside those aimed at bridging the information gap, other initiatives have been undertaken to exploit the interest of market operators in these topics. For example, the AIAF (Italian Society of Financial Analysts) with its Observatory on the possible financial impacts of climate risks and ESG issues and in order to identify suitable analysis and assessment methods, has launched a project to acquire the non-financial information needed to better understand the influences of sustainability topics on the investment decisions of major financial operators (Box 8).

BOX 8 - The initiatives for analysis and the AIAF's conclusions on the assessment of climate change impacts on investment decisions

In 2017, the AIAF sponsored a research project entitled 'Disclosure of climate risks and ESG information'; participants included some major financial market operators, as well as manufacturing and service companies, ESG index providers, fossil fuel research centres and religious orders. The objective was a concrete assessment of the significant impacts that the different sustainability issues have on investment decisions. On the basis of the reflections of the financial market operators involved in the project, the AIAF has drawn the following conclusions:

- Climate change is recognized as one of the main variables of influence with significant impacts that affect returns negatively if not monitored.
- To maximize the performance of their portfolios, many investors are now evaluating the possibility of reallocating their capital in such a way as to reduce the weight of high carbon intensity activities and cover returns against the related risks.
- Financial analysis must also include environmental, social and governance (ESG) considerations, because the strategic, financial and sustainability aspects should be seen as mutually integrated and interconnected.
- Climate efficiency is correlated with financial returns. Investment in sustainable securities could therefore improve returns, because these securities entail fewer environmental risks.
- In particular, the choice of the type of product in which to invest, be it a common fund or an ETF, is not neutral in terms of sustainability.
- The integration of ESG factors will lead people to avoid investing in businesses exposed to environmental risks, thus enhancing the value of more virtuous ones, in the interest of all stakeholders.*

The AIAF is the standard setter for financial analysis, and in line with its elaborations, believes that today more than ever, integration with ESG factors is an indispensable tool for the economic/financial assessment of the impacts that the climate and sustainability in general will have on green investments and on the European economic and financial system.

As a result of the study by its Observatory, the AIAF is therefore committed to contributing to the gradual development of a classification (taxonomy) mechanism - in line with the one proposed by the Technical Expert Group on Sustainable Finance (TEG) of the European Commission - of economic activities that have a positive environmental impact, so as to qualify investments in sustainable assets as such, using a common vocabulary. Only a correct and detailed financial analysis methodology that is able to attenuate the short-term vision in the capital markets and takes account of all factors, including ESG risk/opportunity factors, will provide the impetus needed for a concrete definition of sustainable finance.

Today the support of private finance is therefore necessary to accelerate the transition toward a new, more sustainable model of green economy.

* From AIAF Quaderno No. 173 'Disclosure of climate risks and ESG information', December 2017

The regulators have also taken initiatives to better understand how climate change can affect economic activity and to increase the focus on these issues. In order to understand how the leading insurance companies react to climate risk, in October 2018 IVASS launched its second survey on climate change in the sector. IVASS then amended the corporate governance rules for insurance

companies by requiring that they also take account of environmental risk through regular assessments and reporting by the Board of Directors (Box 9).

BOX 9 - IVASS's initiatives: Regulation No. 38/2018 and the questionnaire on climate change in the insurance sector

On 3 July 2018, IVASS issued [Regulation No. 38/2018](#) on the corporate governance of insurance companies and groups, in compliance with the provisions of the Solvency II Directive, Delegated Regulation (EU) 2015/35 and EIOPA's Guidelines. The new Regulation rationalizes the current regulatory system, at the same time introducing innovative provisions that, for the first time in the European Union, underline the importance of environmental and social factors in the definition of Italian insurance companies' strategic plans and activities. In particular, Article 4(2) of the Regulation stipulates that the corporate governance system's safeguards shall cover all types of corporate risk, including social and environmental ones, either 'generated or suffered'. These risks will have to be properly considered in a specific assessment document drafted by the Board of Directors, and also be reviewed and assessed by the various corporate functions, each one with reference to its own area (Risk Manager, Asset Manager, Human Resources, Compliance and so on). Moreover, Article 47(2) letter (b) of the Regulation envisages the possibility for companies to introduce remuneration systems based, for the variable part, on indicators that are not exclusively financial, such as environmental and/or social performance or customer management. Finally, companies should avoid remuneration policies exclusively or mainly based on short-term results, and the related systems should ensure compliance with laws, rules and regulations and by-laws, as well as with any ethical code; moreover, the risk management function shall help to ensure the coherence of remuneration policies with the propensity to risk/appetite for risk.

In order to have an updated framework on the preparation and strategies put in place by the major companies and groups of companies, both with reference to investment policies and to the management and mitigation of climate change related risk, in October 2018, as part of the quarterly monitoring of the insurance sector's vulnerability, the Institute launched the second survey on climate change in the insurance sector.

The first, dating back to 2016, had been carried out to understand the level of preparation and the strategies put in place by the companies and groups of companies forming part of the 'vulnerabilities' sample (11 systemically important groups and 5 bancassurance companies). The questionnaire, consisting of seven questions, was prepared based on the questions of the survey on insurance intermediaries in the United States conducted by the National Association of Insurance Commissioners. The analysis of the answers showed that some of the leading insurance groups could boast high standards on sustainability issues, but on the whole there was considerable room for improvement in the insurance industry in Italy with respect to climate change-related risks. The new questionnaire, addressed to the same sample of groups and companies, takes account of the entry into force of the abovementioned IVASS Regulation and of any assessment carried out for the year 2017 as part of non-financial reporting as per Legislative Decree 254/2016 for entities subject to this obligation. The questions cover five areas: the current and future impacts of climate change for the insurance sector as a whole, as well as for individual companies or group of companies, the approach to climate change risk management in investment policy, the approach to climate risk as an opportunity and in terms of social commitment, and finally, a specific focus on companies that distribute products potentially affected by physical risk relating to climate change.

5. RECOMMENDATIONS FROM THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Of the international initiatives for assessing CRFR, the most important is the establishment of the former TCFD at the end of 2015, at the instigation of the Financial Stability Board (FSB), aimed at identifying the information gap on the financial risks induced by climate change and

defining guidelines for the dissemination of this information for the benefit of investors, credit institutions, insurance companies and other interested parties. In June 2017, the TCFD published its final report,²⁵ in which it recommended considering both the risks and the opportunities arising from climate change. All reporting entities, regardless of the sector in which they operate, should disclose information about CRFR on four areas (Governance, Strategy, Risk Management, and Metrics and Targets) and should use a scenario analysis, including a scenario for limiting temperature rises to 2°C (reference goal of the Paris Agreement).

The TCFD's **final recommendations** are summarized in Table 2. As mentioned above, they are divided into four thematic areas applicable to organizations from different sectors and jurisdictions:²⁶

- as regards **Governance**, the report recommends pursuing greater transparency for corporate governance regarding climate change-related risks and opportunities;
- for **Strategy**, greater transparency is recommended on both the actual and potential effects of climate change-related risks and opportunities on business, corporate strategy and strategic planning;
- as regards **Risk Management**, importance is given to disclosure on the organization and processes of climate risk identification, measurement and management, as well as their integration into the wider corporate risk system;
- for **Metrics and Targets**, greater transparency is recommended in the processes used for measuring and managing climate risks.

To facilitate the dissemination of recommendations on CRFR, the publication of the report was accompanied by that of two annexes, one of which specifically focuses on implementing the recommendations.²⁷

The presentation of the said report was supposed to complete the TCFD's tasks; however, the FSB decided to extend the TCFD's activities by asking it to continue its work on monitoring the implementation status of the recommendations on climate-related financial risk disclosure.

The **first report** on the implementation status²⁸ found the following results: (i) although many of the reports analysed contain climate risk-related information, this information is given in sustainability reports that do not take account of the financial impact of climate change on the company; (ii) information on the capacity to mitigate the risks (the Strategy) is limited and scenarios of limiting temperature rises to 2°C are only used in a few cases;²⁹ (iii) information disclosure is extremely diversified across sectors and geographical areas: a higher percentage of non-financial corporations provide information on metrics and targets with respect to financial companies, whereas a higher share of financial companies describe the corporate risk management processes. In terms of regional differences, the percentage of companies in Europe that have followed the TCFD's recommendations is higher; and (iv) the information disseminated according to the TCFD's

²⁵ Available at: <https://www.fsb-tcfid.org/publications/final-recommendations-report/>

²⁶ The TCFD has also developed insights dedicated specifically to finance companies (banks, insurance, asset managers and asset owners) and to companies operating in the energy, transport, construction and agri-food sectors.

²⁷ The first is the 'Annex: Implementing the Recommendations of the TCFD'; the second is a technical document that contains suggestions for realizing the scenario analysis ('Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities')

²⁸ Available at: <https://www.fsb-tcfid.org/publications/tcfid-2018-status-report/>

²⁹ Only a few companies provided a description of the resilience of their strategies to different climate change-related scenarios, including that of limiting temperature rises to a maximum of 2°C, which is key for the Task Force's activities.

recommendations is ‘scattered’ across multiple documents (financial documents, annual reports and sustainability reports).

Table 2. Recommendations and the relative reporting suggested by the TCFD

Governance	Strategy	Risk Management	Metrics and Targets
Make the corporate governance structure public with regard to climate-related risks and opportunities.	Make any material impact public, whether current or future, of climate-related risks and opportunities on the company’s economic activity, strategy and financial planning.	Assessing the process by which the company identifies, quantifies and manages climate-related risks.	Make public any material metrics and targets used to assess and manage climate-related risks and opportunities.
Recommended reporting	Recommended reporting	Recommended reporting	Recommended reporting
Describe the Board’s oversight of climate-related risks and opportunities.	Describe climate-related risks and opportunities in the short, medium and long term, as identified by the company.	Describe the corporate organizational processes aimed at identifying and assessing climate-related risks.	Describe the metrics used by the company to assess, in line with its strategy and risk management process, climate-related risks and opportunities.
Describe the role of the corporate management in the assessment and management of climate-related risks and opportunities.	Describe the current and future impacts of climate-related risks and opportunities on the economic activity, strategy and financial planning of the company.	Describe the corporate organizational processes aimed at managing climate-related risks.	Disclose Scope 1 and 2 GHG emissions and, if any, Scope 3 ones, and related risks.*
	Describe the resilience of the company’s strategy by taking into account the different climate scenarios, including that of limiting temperature rises to maximum 2°C.	Describe how the company’s organizational processes aimed at the management of climate-related risks are integrated in the company’s overall risk.	Describe the company’s target for the management of climate-related risks and opportunities and assess performance with respect to these targets.

*Scope 1: direct greenhouse gas emissions; Scope 2: indirect greenhouse gas emissions (energy inputs, etc.); Scope 3: other emissions (value chain and so on)

Source: FSB 2017

These findings are largely confirmed also at sectoral level for the banking³⁰ and insurance industries.³¹

As regards the **banking sector**, the examination of the practices adopted for financial disclosure by a small group of 25 banks shows that:

- **Governance:** the majority provided information about the role of their Board and the Management on climate-related issues.
- **Strategy:** most banks put greater emphasis on transition risks than on physical risks in their reports on climate-related risks and opportunities. Some of them believe that some of the fears linked to climate change may lead to regulatory changes that could increase the operating costs of their counterparties and, more in general, impact negatively on the investments made. Most banks provided a description of the consequences of climate-related issues on their business activities; however, only some of them indicated whether and to what extent their corporate strategies would be resilient to different climate-related scenarios.
- **Risk Management:** the majority made information available on the processes for identifying, assessing and managing climate-related risks, and stressed that these processes are integrated into their general process for corporate risk management. Some of the banks

³⁰ The TCFD considered 301 banks from 54 countries. The most frequently available type of information is that on climate risk identification and assessment process. The information disclosed by banks in their financial reports is found to be, among the questioned groups, the most in line with the Task Force’s recommendations.

³¹ The survey involved 311 insurance companies from 54 countries. In general, they provided information that seems to be in line with the Task Force’s recommendations, with less relevance compared with the other 5 groups surveyed.

described how they determined the relative importance of climate-related risks with respect to other types of risk and the processes for assessing the potential magnitude of these risks.

- **Metrics and Targets:** most institutions made available the metrics that they use to estimate or monitor climate issues. Many banks pay particular attention to the metrics and targets linked to climate-related opportunities, such as green bonds and commitments to specific market segments, with a focus on the social and environmental dimension in order to encourage the development of a low-carbon economy.

As regards the **insurance sector**, the examination of the financial disclosure practices adopted by a small group of 25 insurance companies showed that:

- **Governance:** most companies described their oversight of climate-related issues at Board level, whereas others provided indications about the frequency of the Board meetings during which these issues are addressed. Normally, however, the specific roles and responsibilities of the management structure were not described.
- **Strategy:** most insurance companies made information available on climate-related risks and opportunities, providing indications as to the impact of climate issues on the current economic trend of their business, strategies or financial planning. Some companies indicated how their strategies would be resilient to different climate-related scenarios; half of them mentioned the use of a 2°C scenario.
- **Risk Management:** most companies provided information on the climate risk identification and assessment processes; however, a significantly lower number described their management processes for these risks. Most companies indicated that the climate risk identification, assessment and management processes are an integral part of the wider risk management system.
- **Metrics and Targets:** most institutions made available the metrics that they use to estimate or monitor climate-related issues.

6. SURVEY CHARACTERISTICS AND RESULTS

The WG3 started with the documents produced by the TCFD to design a questionnaire that was then administered via the Web to the main financial operators in Italy. Participation in the questionnaire was voluntary; the 25 respondents included 16 banks, 4 insurance companies and 5 investment companies.

The questionnaire - structured in such a way as to reproduce the areas for intervention identified in the TFCF's recommendations on CRFR disclosure - aims to assess the following aspects:

- (i) what the governance process for CRFR is (e.g. the frequency with which the corporate bodies discuss the potential effects of climate change on their business) - 5 questions;
- (ii) what strategies have been adopted to defend themselves from climate-related risks and seize the opportunities linked to the different dimensions of climate change (e.g. for limiting their emissions or defining policies to put pressure on companies in which they invest) - 8 questions;
- (iii) how the CRFR is included in the operator's overall Risk Management (e.g. if account is taken of the CRFR when deciding to make an investment or to disburse a loan) - 41 questions;
- (iv) finally, what Metrics and Targets are taken into account to complete the strategies outlined in point (ii) - 20 questions.

The responses to the questionnaire (see the Appendix) provide a general framework on the readiness of the financial system to address climate-related risks and opportunities and the policies for combating the said risks.

In terms of governance, the CRFR is managed in a discontinuous manner and with no appropriate structures for assessing it. A quarter of respondents stated that the governance bodies regularly take climate issues into account when defining their objectives (Item A2) and less than half have a suitable structure for doing so (Item A4). In half of the cases, climate change issues are the direct responsibility of the Board of Directors or Top Management (Item A5). In a quarter of cases, the governance bodies have never been informed about climate change issues, and when they are informed, this usually happens once a year (Item A1).

As regards the strategy, half of the respondents stated that they have decided to reduce their own emissions (Item B3) and a high proportion of those who have not yet reduced them claimed to have plans do to so in the future. A lower share of respondents are actively working to reduce the CRFR of the companies in which they invest (33 per cent) (Item B5). Although these figures are still limited, they have been increasing over time, given that over two thirds of respondents stated that in the last 5 years they have increased their focus on climate risk issues (Item B6). This makes it possible for half of the respondents to fulfil any climate risk disclosure obligation within a year (Item B8).

This result appears somewhat optimistic if compared with the experience that operators have had with the management of risks linked to mitigation of or adaptation to climate change: most respondents have no experience in these investments or in terms of liquidity risk or operational risk (Item C3-C4). Almost two thirds of respondents have no investment policies to mitigate the market risk linked to CRFR (Item C7) and did not assess the possible effects of this in terms of reputational risk (Item C8). Most operators instead take account of the impact of CRFR on the conformity risk (Item C9). Finally, only a small share of operators (32 per cent) gave public evidence of their strategies on CRFR (Item C10). The delays in CRFR management are obvious when we look at the

use of emission scenarios for investments (for assessing the transition risk): less than 5 per cent use these tools and less than a quarter are working towards being able to carry out this type of analysis (Item C11-C14). The main obstacles are the difficulty in obtaining the necessary information and in defining the modelling (Item C15). Despite the awareness level of the insurance sector being higher, 40 per cent of companies in the sector still stated that they do not take account of climate change effects in determining premiums (Item C16).

Moreover, the ability to seize the opportunities arising from climate risks is modest: over half of the respondents have no financial/insurance products linked to environmental or social variables (Item C20). None of the insurance companies surveyed defined a target market that takes account of environmental variables (Item C21, as determined by European law) and only a quarter considered the impact of CRFR on their investment portfolio (Item C22).

As regards the funded activities, those related to climate change mitigation are more common, and in particular those relating to the spread of renewable energies (Items C24-C28). The financial flows linked to adaptation activities and mainly to resources allocated to agriculture and water resource management (Items C29-C40) are lower. The return profiles for these forms of financing/investment were similar to others; the main reason that limits operators from allocating resources to these activities is their lack of knowledge (Items C28 and C37).

As regards Metrics and Targets, the need has emerged for greater investment by financial operators, which cannot progress autonomously, however. In fact, to date more than 80 per cent have no information on the carbon footprint of their own investments, and also in these cases the lack of information is pointed out as the main obstacle, along with the fact that this issue is not considered as a priority (Items D1-D14). More than three quarters of respondents have no indicators of the extent to which their assets are exposed to the physical risk (D17-D18), and a similar percentage have no tools for assessing the impact of the transition risk (not even qualitatively) (Items D19-D20).

7. CONCLUDING REMARKS AND POSSIBLE FUTURE ACTIONS

The impulse for the financial system to take even greater account of ESG factors in the provision of its services is becoming increasingly strong. The pressure to take account of environmental issues, and in particular the effects of climate change and the risks they pose to the economy and society, has intensified.

The speed with which these changes are taking place (just think of the activism of the European Commission for giving substance to its Action Plan for Sustainable Finance) means there is the risk of finding that the financial sector is not fully ready yet, as can be deduced from the results of our survey (which are generally in line with those of the surveys conducted by the TFCF and the UK PRA on the banking sector). This difficulty is mainly due to the lack of data and conceptual models for univocally identifying the transmission channels that link the climate, the real economy and financial markets to each other, at both micro- and macro-economic level.

In order to better understand these channels, it is therefore necessary to identify robust methodologies so as to be able to identify and assess the CRFR. Theoretically, risk indicators (KRIs) should be developed to identify those entities that, in relative terms or better still in absolute terms, are more or less exposed to the CRFR (both in terms of physical risk and transition risk).

However, the information to reconstruct such links upstream is not immediately available and is often only exchanged and debated in the scientific environment (and using scientific jargon). In order to identify the mechanisms through which climate risks may spread to the financial system, it is therefore necessary to make an effort to bring these different cultures closer to each other, so that they can increase their dialogue and share data and experiences.

Action 1: collect the basic data needed to evaluate the CRFR and disseminate them through a Climate Information Hub (CIH). The CIH could be a section of the Knowledge Platform managed by the Ministry of the Environment, Land and Sea (MATTM).

A first step could be to establish a Climate Information Hub (CIH) (as already recommended by the Green Finance Study Group of G20³²), taking as a model the Knowledge Hub realized by the TCFD (www.tcfdhub.org/). However, the CIH should report on studies, data and best practices using accessible language and methods that ensure the usability of information (e.g. data matrices on spreadsheets, downloadable charts both as images and with the associated data, and so on).

The data to be made available could be of three types: historical information (historical data), future projections (scenarios) and examples of climate policies (best practices). Table 3 shows some examples of these three types of information available on the Web; the list is not absolutely exhaustive and information should include emission growth scenarios, energy demand forecasts, mapping of potentially climate-related natural risks (e.g. hydrogeological risk), water stress situation projections, power generation costs (both current and future ones) and external costs of the main climate change-related environmental issues (e.g. landfill waste, transport and so on).

³² G20 Green Finance Study Group (2017), 'Improving the Availability, Accessibility and Relevance of Publicly Available Environmental Data for Financial Analysis', draft document.

Table 3. Examples of information to be collected using the CIH

Information	Type of information	Source of information
Natural risk (landslides and floods)	Historical data	ISPRA, http://www.sinanet.isprambiente.it/it/sia-ispra/download-mais/mosaicature-nazionali-ispra-pericolosita-frane-alluvioni
Power generation costs	Historical data	IRENA, http://resourceirena.irena.org/gateway/dashboard/?topic=3&subTopic=1066 and RSE, http://www.rse-web.it/notizie/Energia-elettrica-anatomia-dei-costi-ecco-l-rsquoanalisi-agg.page
Sectoral emissions	Historical data	ISTAT (Namea), http://dati.istat.it/Index.aspx?DataSetCode=dcn_contiematmrev2 ; EEA, https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer
List of climate policies	Best practices	IEA, https://www.iea.org/policiesandmeasures/climatechange/
Policies for renewable energy sources	Best practices	IEA, https://www.iea.org/policiesandmeasures/renewableenergy/ ,
Policies for energy efficiency	Best practices	IEA, https://www.iea.org/policiesandmeasures/energyefficiency/ ; https://www.iea.org/beep/ UNEP-DTU, http://orbit.dtu.dk/files/127152472/Best_Practises_for_Industrial_EE_web_1_.pdf
Emission growth scenarios	Scenarios	Information that uses IPCC (Representative Concentration Pathways) standards with the RCP database available at http://www.iiasa.ac.at/web-apps/tnt/RcpDb/ Scenarios for limiting temperatures rises to 1.5°C https://data.ene.iiasa.ac.at/iamc-1.5c-explorer IEA, World energy outlook 2018 (new policies scenario, current policies scenario, sustainable development scenario): https://www.iea.org/weo/weo2018/secure/data/ CMCC, WITCH is a global dynamic model integrating the interactions between the economy, the technological options, and climate change, https://www.witchmodel.org/simulator/
Energy demand scenarios	Scenarios	IEA, World energy outlook 2018 (new policies scenario, current policies scenario, sustainable development scenario): https://www.iea.org/weo/weo2018/secure/data/ CMCC, WITCH is a global dynamic model integrating the interactions between the economy, the technological options, and climate change, https://www.witchmodel.org/simulator/
Expected impacts	Scenarios	For Italy, data on historical trends, climate scenarios and extreme climate events. For every Italian region, the expected annual trend can be found up until 2100 http://climed.rse-web.it Scenarios for different impact indicators in Europe http://www.clip.eu/impact-indicators/use-the-toolkit Collection of international studies on the impacts: http://impactsclimatechange.info/

The CIH could be located at the Ministry of the Environment, Land and Sea (MATTM), where the whole initiative of the OIFS (Italian Observatory on Sustainable Finance) originated; for example a special ‘Climate Change-related Financial Risks’ section may be added onto the Knowledge Platform (<http://www.pdc.minambiente.it/it>).

Setting up the CIH and the activities to identify the steps required for the scenario analysis could show how not all the information available allows an accurate CRFR assessment to be made. In the medium term, this Climate Information Gap (CIG) will be filled.

Action 2: A further activity to bring forward may be the compilation of a list of not yet available information for the bridging of the Climate Information Gap (CIG).

Much of the information needed for an appropriate assessment of the CRFR is missing. For example, information on the economic effects of climate change is not immediately available for Italy and is often taken from other studies (with potentially distortive effects which may also be significant). For this reason, in order to improve our understanding of the CRFR, it would be a good idea to identify the information to be collected as a priority (e.g. effects of temperature rises on health or productivity; value of capital at risk in areas exposed to high hydrogeological risk, and so on). To this end, a debate between institution managers and representatives from the academic world would be useful (expert surveys, sample surveys, studies for estimating this information, and so on).

Action 3: assess the methodologies to insert climate scenarios in the decision making processes of financial institutions, with the aim of developing ‘typical’ climate scenarios (TCSs).

While the CIH for the CIG can be realized within a relatively short time, developing a series of quantitative and qualitative analyses for integrating climate scenarios in the decision-making of financial institutions is more complex, also taking account of what will be defined by supervisory authorities. These scenarios should allow an organization to explore how the physical and transition risks (and related opportunities) could affect their activities.

The biggest difficulty is identifying a logical scheme that connect the impacts of climate change and climate policies to the economic variables: it is therefore necessary to make as clear and explicit as possible the hypotheses on the links between climatic variables (e.g. temperature rises or the carbon tax) with economic variables (e.g. energy output increase or the evolution of energy product prices) and therefore with financial variables (e.g. cash flows, the average PD or LGD of the banks that are most exposed to carbon-intensive sectors). Moreover, the definition of scenarios will require the collection of a series of input data, with the additional problem that these data should be available for long-term time horizons (according to the TCFD’s recommendations, at least until 2040).

The transition scenarios should describe how climate policies or the medium-term effects of climate change may influence technological choices or certain economic variables (e.g. the trading of final goods on the market, the expenditure of households or general government, production factors, and investments and the labour market). Once identified, the outputs of the different scenarios could be summarized as a set of risk factors that influence a company’s key performance indicators.³³

Inside the OIFS, or as a continuation of the WG3 activities, a working group on scenarios could be set up to bring together experts in climate and energy scenarios (e.g. researchers from ISPRA, ENEA, RSE and CMCC), financial analysts, risk managers and environmental economists to think about how to define a set of tools to support financial operators in starting up a scenario analysis. To meet the diverse needs of the operators involved, the working group could realize solutions of different degrees of complexity (perhaps starting with providing support to qualitative assessments as suggested by the TCFD) with the goal of defining Typical Climate Scenarios (TCS).

The tools used for analysis should be flexible (so that they can be adjusted in the event that new information becomes available) and especially easy to use, so as to ensure that the use of this type of analysis spreads out as much as possible between financial operators, thereby increasing their awareness with CRFR.

³³ In a report prepared in support of the TCFD’s recommendations, it is suggested that four risk factors should be modelled, through the development of four channels: 1) costs linked to the direct greenhouse gas emissions in a basic scenario (changing, e.g. the market exchange price of emission permits, or assuming the introduction of a carbon tax); 2) incremental costs of indirect emissions or production inputs compared with a basic scenario; 3) investment spending to renew carbon-intensive infrastructure and/or acquire low-carbon capital; and 4) modification of revenues as a combination of changes in consumer preferences and the variation in relative prices. See ‘Extending Our Horizons: Assessing Credit Risk And Opportunity In A Changing Climate. PART 1: Transition-related risks & opportunities’.

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Appendix 1 - OIFS (Italian Observatory on Sustainable Finance) Working Group 3 - members and mission

The Working Group (WG3) has the objective of understanding the practical implications of these initiatives for agents that operate in Italy's financial markets (banks, insurance companies, institutional investors), by focusing essentially on climate-related financial risk (CRFR). In particular, the objective of the WG3 is to study and assess (i) the situation of financial operators with reference to CRFR disclosure and management and how recommendations from the TCFD and guidelines from the GFSG should be used to ensure that this type of risk in its various forms (physical, transition, responsibility risk) becomes an integral part of the risk management and communication process; and (ii) how the special features of the Italian financial system should shape possible developments on this topic, with a particular focus on the activities of the HLEG.

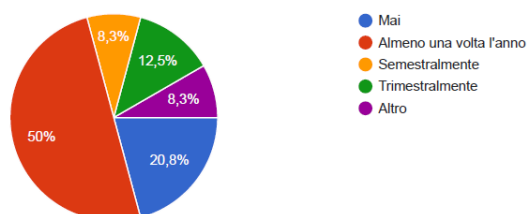
WG3 members

<i>Coordinators</i>	
BANCA D'ITALIA	Ivan Faiella
MEF	Gelsomina Vigliotti
<i>Members</i>	
ABI	Claudia Pasquini
ABI	Angela Tanno
AIAF	Alberto Borgia
AIAF	Andrea Gasperini
ANIA	Pietro Negri
BANCA D'ITALIA	Marianna Caccavaio
BANCA D'ITALIA	Filippo Natoli
CDP	Alberto Carriero
Generali	Lucia Silva
Global Compact Network Italia	Marco Frey
IVASS	Francesca Martinelli
IVASS	Roberto Novelli
MEF	Alessandra Diotallevi
MEF	Danila Malvolti
Unicredit	Giorgio Capurri
MATTM	Gionata Castaldi
UN Environment	Davide Dal Maso

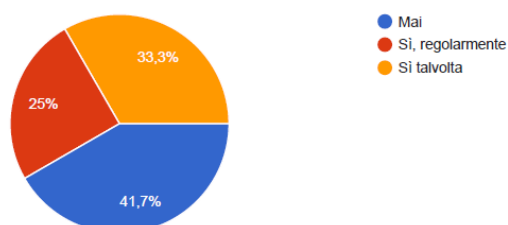
Appendix 2 - Responses to the survey questions

Section A - Governance

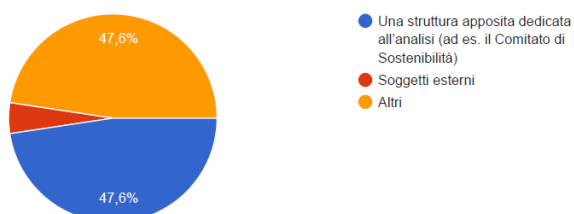
A1. How often is the BoD or other governance body informed on climate change-related issues?



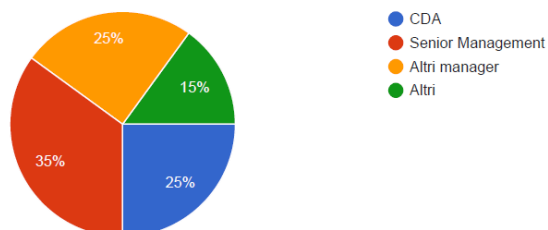
A2. Does the BoD or other governance body normally take account of climate change-related issues in defining strategies, risk management, business objectives and investment policies?



A4. Describe the structures within your organization that are responsible for managing all climate change-related issues and their role, in particular with reference to the Board of Directors.

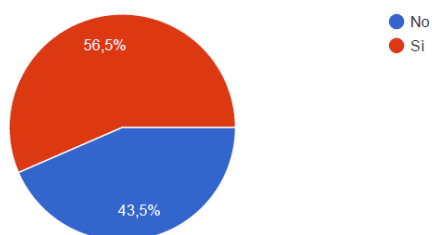


A5. What level of management is directly responsible for climate change-related issues?

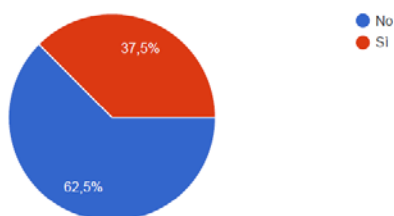


Section B - Strategy

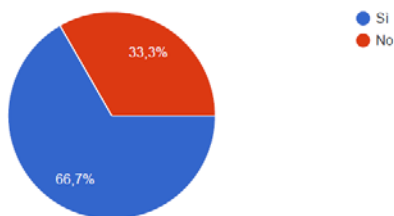
B3 Have you set any CO₂ atmospheric emission reduction targets for your company?



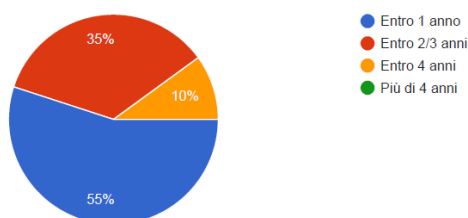
B5. Is your company actively engaged with regard to the issuers in which it invests to promote better management of climate-related risks?



B6. Over the last 5 years, have you raised the level of attention towards the environmental risks, especially climate change-related ones, which weigh heavily on your activity?

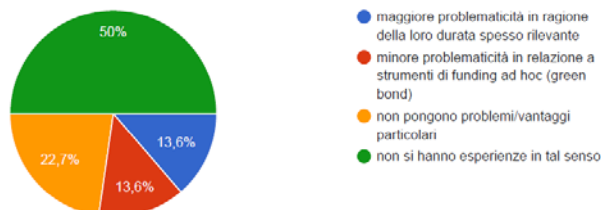


B8. Assuming that the following provision on reporting from banks to Supervisory Authorities is added into the CRR2/Solvency II: "A description of climate risks which could arise in the short, medium or long term and which could have a material or financial impact on the institution, and whether it is a physical risk or a transition risk", how long from today would you need to be able to comply with it?



Section C - Risk Management

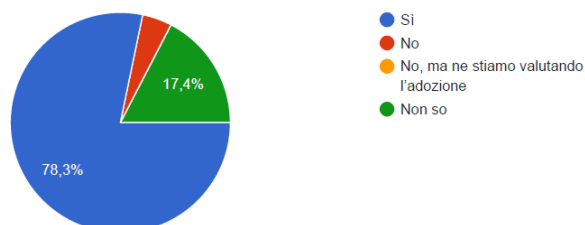
C3. Liquidity Risk: from the point of view of funding, the financing of projects for the mitigation of and adaptation to climate change is characterized by:



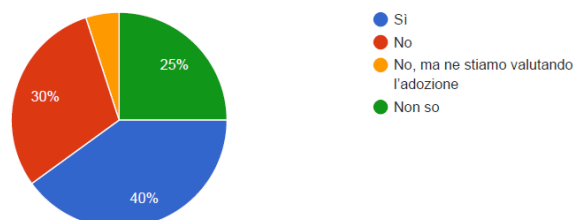
C4. Operational Risk: do you record evidence of damage relating to your property and linked to landslides, floods, fires separately? Do you also use this evidence for analysing risks relating to counterparties that operate in the same areas?



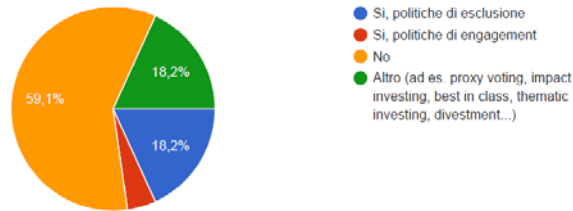
C5. Operational Risk: is there any form of insurance against the effects of damage relating to your property and linked to landslides, floods, fires?



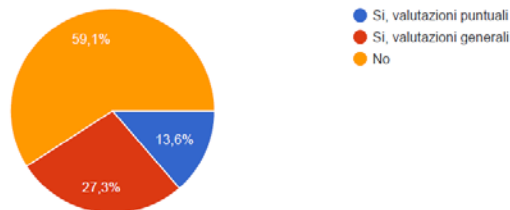
C6. Operational Risk: do you offer credit counterparties or counterparties in which you have invested any form of insurance against the effects of damage to their buildings and connected to landslides, floods, fires?



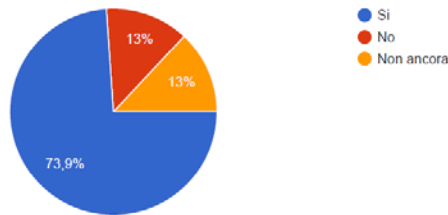
C7. Market risk: within the framework of the management of your portfolio, is there any investment policy linked to procedures for identifying and managing environmental and climate change-related risks?



C8. Reputational risk (possible breach of the fiduciary duty): is there any assessment of possible effects (sanctions, public opinion campaigns) linked to an underestimation of climate change-related risks?

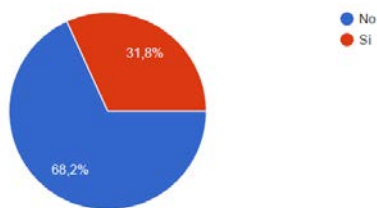


C9. Conformity risk: does your company assess the risk of non-compliance with first and second level laws and regulations on the environment and climate change?

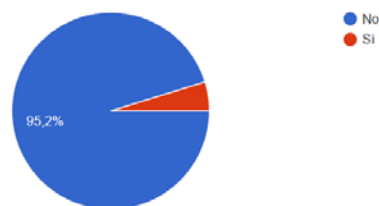


C10. With respect to the questions asked in this survey, are there any public documents that describe the policies developed?

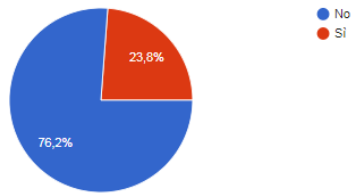
22 risposte



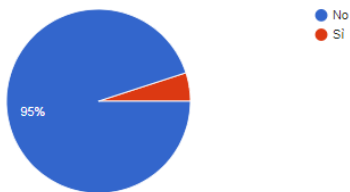
C11. As part of the management of your portfolio, do you assess the impact of the different emission scenarios on your investments (e.g. a scenario that assumes that policies are implemented to keep temperature rises within 2°C compared with pre-industrial levels)?



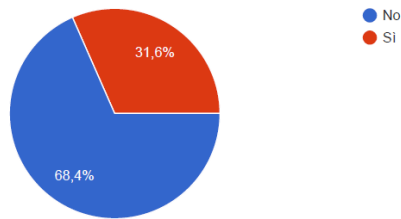
(If no, go to C11) C12. Are you taking any steps to produce assessments with scenarios?



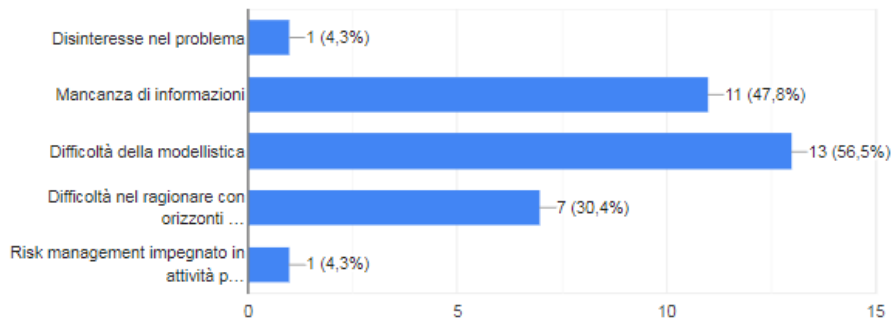
C13. As part of the management of your CREDIT PORTFOLIO, do you assess the impact of the different emission scenarios (e.g. a scenario that assumes that policies are implemented to keep temperature rises within 2°C compared with pre-industrial levels)?



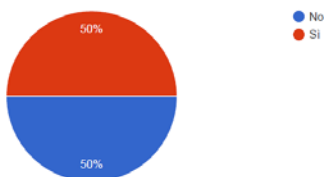
(If no, go to C13) C14. Are you taking any steps to produce assessments with scenarios?



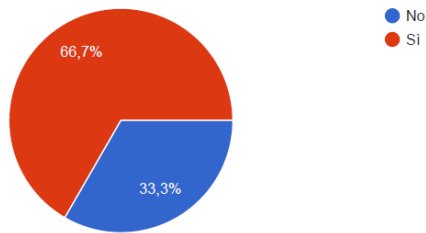
C15. What are the main difficulties encountered in doing this exercise (on the scenarios?) or in deciding not to do it?



(FOR INSURANCE COMPANIES ONLY) C16. When setting non-life insurance premiums, do you take account of the impact that climate change may have in terms of the intensity and frequency of covered natural events? (e.g. see ANIA circular letters on transport insurance (bodies and activities)).



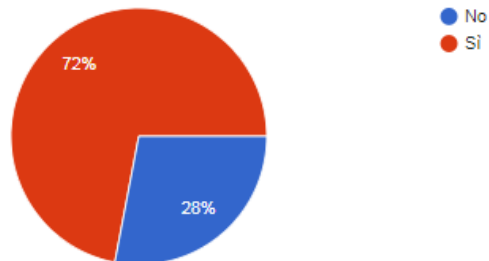
(FOR INSURANCE COMPANIES ONLY) C17. Do risk reduction measures entail changes in the premiums? If yes, what kind of measures are they? (See e.g. new products or insurance investments - to counter the risks arising from floods and drought - in which account is taken of the prevention, management and resilience measures taken)



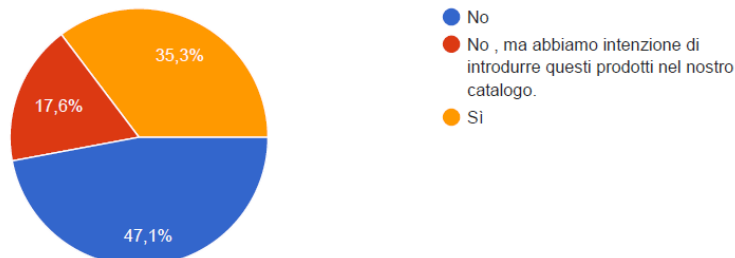
(FOR INSURANCE COMPANIES ONLY) C18. Liability risk. Have you assessed the potential impact of having sold liability insurance policies to persons or entities that may be held liable for having underestimated the risks of events induced by climate change?



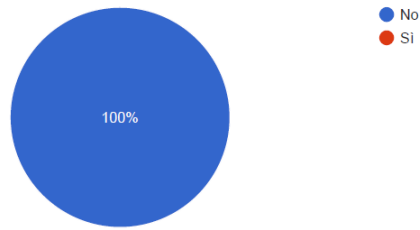
C19. Are you aware of the intention of the EU Commission to introduce new financial/insurance products linked to environmental and social variables?



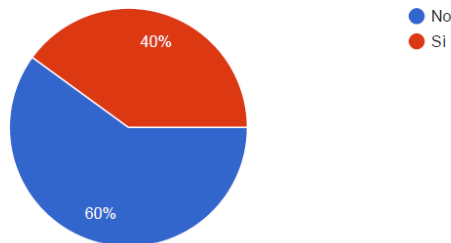
C20. Do you have products of this type?



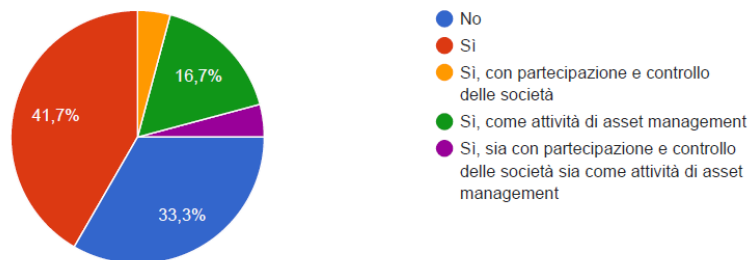
(FOR INSURANCE COMPANIES ONLY) C21. In the context of the Product Oversight Governance envisaged by the Insurance Distribution Directive (EU) No. 2016/97 (IDD), have you identified a target market for your customers that takes account of environmental variables linked to climate change?



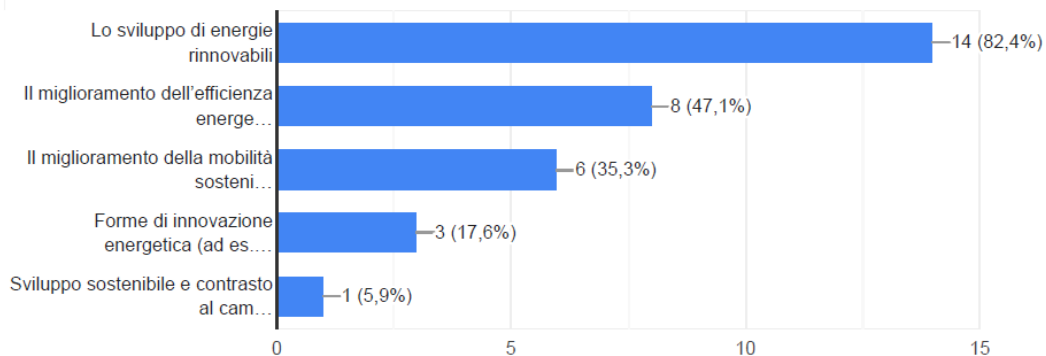
(FOR INSURANCE COMPANIES ONLY) C22. Have you considered the impact of climate change on your investment portfolio? Have you modified your investment strategy in response to these considerations?



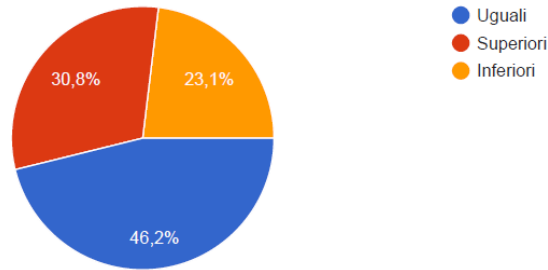
C24. Did you make investments linked to climate change mitigation policies in the past?



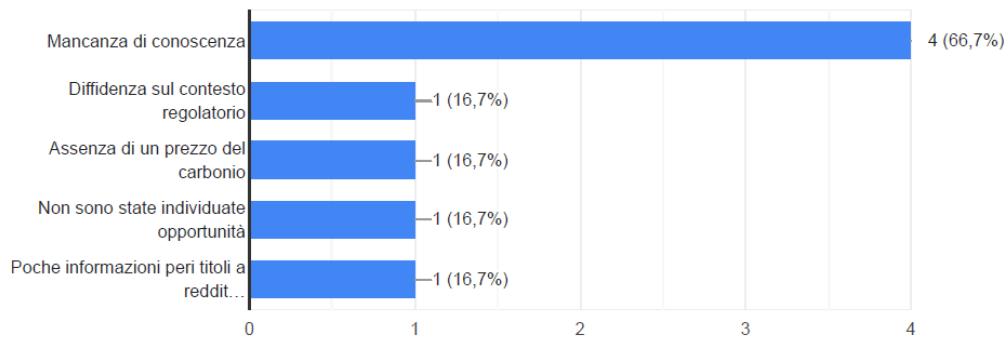
(If yes, go to C24) C25. These investments covered (you can choose more than one answer):



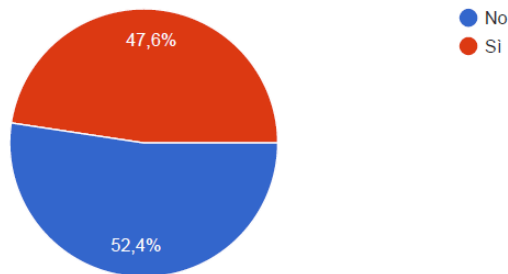
(If yes, go to C24) C27. Compared with your 'typical investments', the returns from these investments were normally:



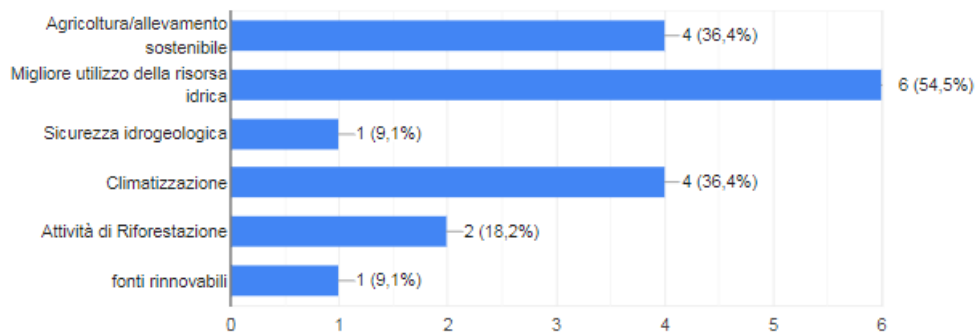
(If no, go to C24) C28. Why didn't you make these investments?



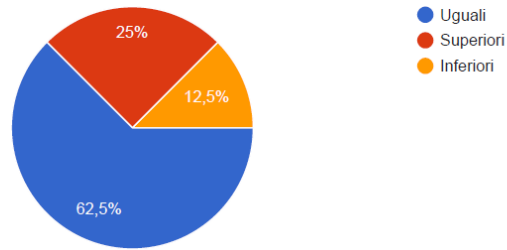
C29. Did you make any investments in the past linked to policies for adaptation to climate change (e.g. water management, hydrogeological safety, cooling and so on)?



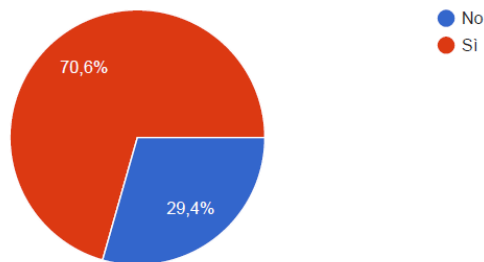
(If yes, go to C29) C30. These investments covered (you can choose more than one answer):



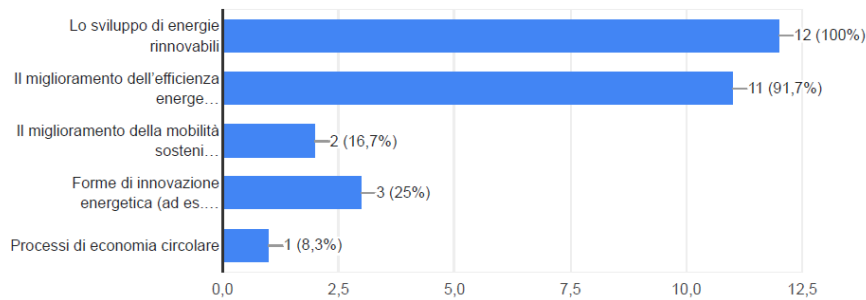
(If yes: go to C29) C32. Compared with your "typical investments", the returns from these investments normally were:



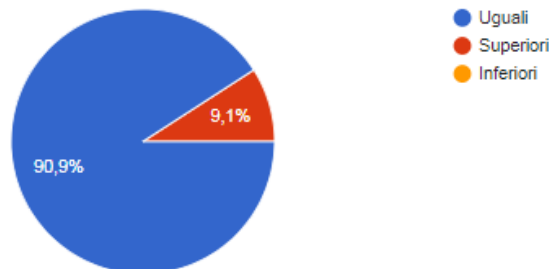
(FOR BANKS ONLY) C33. Did you open credit lines in the past that were used for investments linked to climate change mitigation policies?



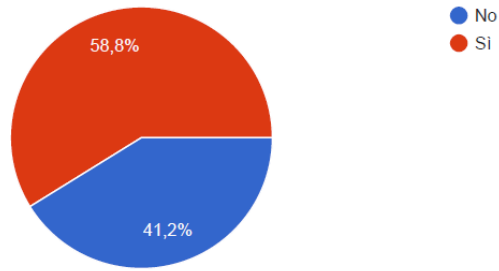
(FOR BANKS ONLY; if yes, go to C33) C34. These credit lines were used for (you can choose more than one answer):



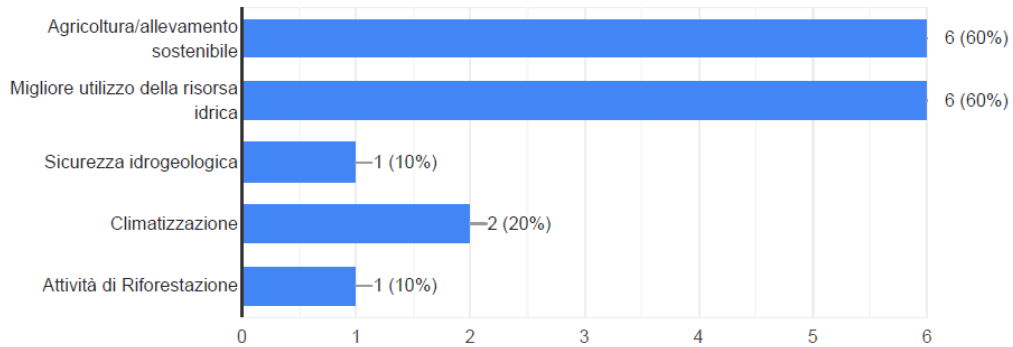
(FOR BANKS ONLY; if yes, go to C33) C36. Compared with your 'typical uses', the returns from these credits were normally:



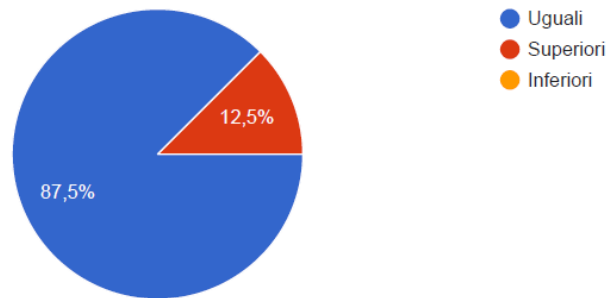
(FOR BANKS ONLY) C38. Did you open credit lines in the past that were then used for investments linked to climate change adaptation policies (e.g. water management, hydrogeological safety, climatization and so on)?



(FOR BANKS ONLY; if yes, go to C38) C39. These credit lines were used for (you can choose more than one answer):

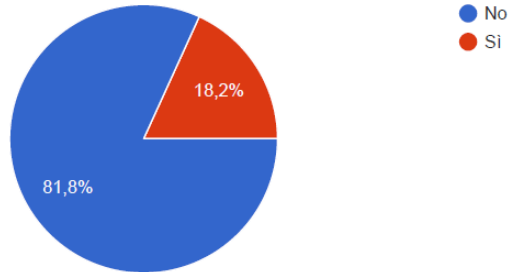


(FOR BANKS ONLY; if yes, go to C38) C41. Compared with your 'typical uses', the returns from these credits were normally:

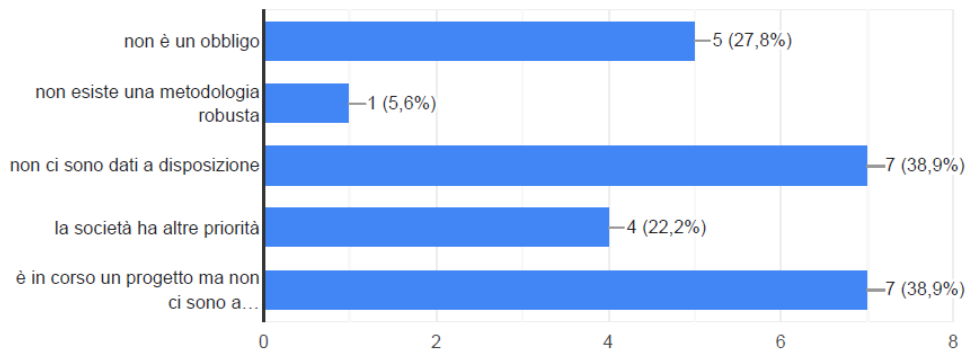


Section D - Metrics and Targets.

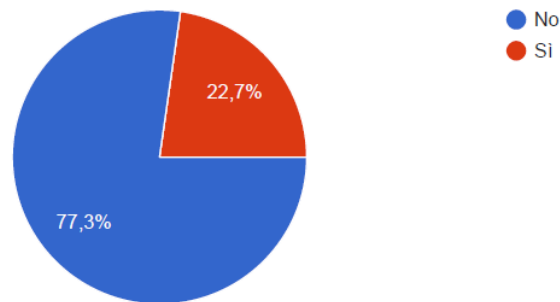
D1. Have you got any information on the total emissions attributable to companies in which you have invested (ratio between the total CO₂ emission level of companies included in the asset allocation and the shares in your portfolio compared with the total number of shares)?



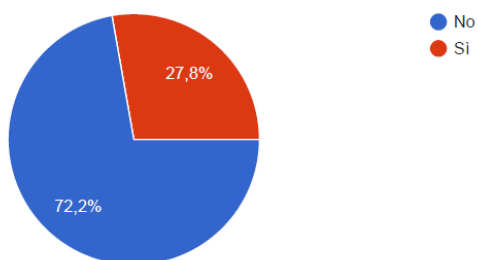
(If you answered no, go to D1) D2. Could you please explain why you haven't got this information (max. 3 answers)?



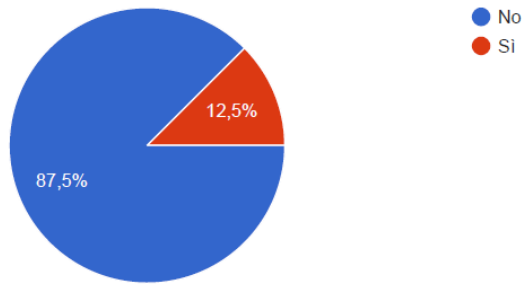
D3. Do you know the CARBON INTENSITY of your investments, by participation or asset management, (CO₂ emissions level - direct and indirect Scope 2 emissions - generated for every euro invested in the portfolio)?



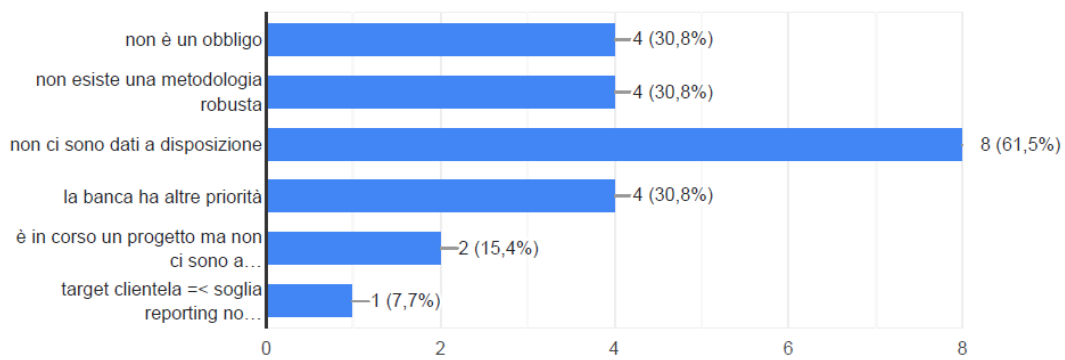
(If no, go to D3) D6. Are you currently working on estimating the carbon intensity of your investment portfolio?



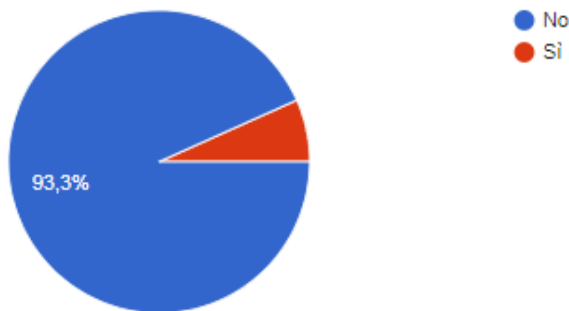
(FOR BANKS ONLY) D8. Have you got any information on the total emissions attributable to companies to which you disbursed credit?



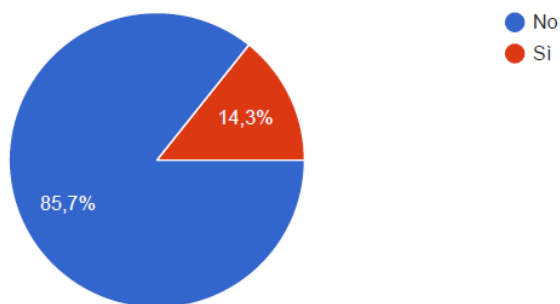
(FOR BANKS ONLY; if no, go to D8) D9. Could you please explain why you haven't got this information (max. 3 answers)?



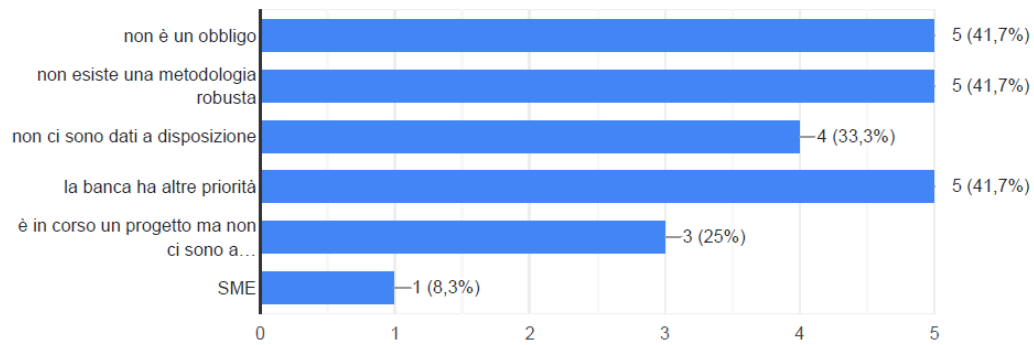
(FOR BANKS ONLY) D10. Do you know the CARBON INTENSITY of your uses (CO₂ emissions level - direct and indirect Scope 2 emissions - generated for every euro used in the credit portfolio)?



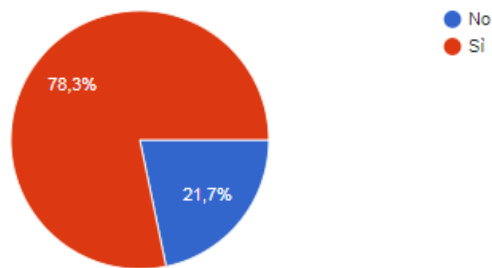
FOR BANKS ONLY; if no, go to D10) D13. Are you currently working on estimating the carbon intensity of your credit portfolio?



(FOR BANKS ONLY; if No: go to D13) D14. Could you please explain why you are not doing so (max 3 answers)?



D15. With reference to the direct impacts on the environment (SCOPE 1 and SCOPE 2), are you taking any steps to assess the CO₂ atmospheric emissions of your bank/company?



(If no, go to D15) D16. Could you please explain why you haven't taken any steps to assess emissions (max. 3 answers)?

