



Sustainable climate investments



Forum per la
Finanza Sostenibile



Forum per la
Finanza Sostenibile

Sustainable climate investments

BPER:

Banca

BPER Banca is the parent company of the BPER Group, the sixth largest banking group in Italy in terms of total assets, deposits and loans; through investee companies or joint ventures, it is active in all the main market segments.

The Group is present today in 19 Italian regions, with a network of 1,349 branches throughout the country, as well as a branch in the Grand Duchy of Luxembourg.

For years, BPER Banca has embarked on a process of integrating sustainability into its corporate values, with the aim of creating benefits for all of its stakeholders in the medium-long term. The Sustainability Report, the 2019-2021 Business Plan and the 2020-21 Sustainability Plan are a concrete demonstration of this, while the assessments obtained from the rating agencies are a confirmation.

BPER Banca pursues sustainability objectives based on the Social Development Goals (SDGs) identified by the United Nations (UN) and, since 2017, adheres to the UN Global Compact, sharing its principles: integrity and sustainability are in fact the founding values on which the BPER Group bases its work in order to create long-term sustainable wealth for its stakeholders and for all the geographical areas in which the Group is present.

The bank wants to be more and more a partner for its customers, providing solutions and skills to accompany households and businesses in the design and implementation of growth and improvement projects with a view to sustainability and to support the transition to a low-carbon intensity economy.

BPER Banca is a shareholder in Banca Etica and Etica SGR, of which it is the first placement bank by volume of funds sold. Arca Fondi SGR, a member of the BPER Group, has adhered to the Principles for Responsible Investment (PRI) and offers Environmental, Social and Governance (ESG) products.

Etica Sgr is the only Italian asset management company that exclusively offers sustainable and responsible mutual funds aimed at private and institutional investors, with the aim of representing the values of ethical finance in financial markets.

The distinctive character of Etica Sgr's funds is the rigorous selection of securities issued by companies and countries that show a special commitment to environmental protection, human rights and good corporate governance.

Etica Sgr sustains a constant dialogue with the management, and exercises its voting rights in the shareholders' meetings of the companies in which its funds invest, in order to urge companies towards more responsible behaviours and help them to achieve this goal.

By embracing ESG criteria, codified in a transparent methodology, Etica Sgr is able to manage risk more effectively and to seize interesting investment opportunities.

In Etica Sgr's responsible investment, the goal of achieving positive financial returns goes hand in hand with generating positive effects for the environment and society. As the last phase of the sustainable and responsible investment process we measure the impact of our funds' equity investments, in relation to the social, environmental and governance indicators linked to the United Nations SDGs (Sustainable Development Goals).

Etica Sgr is an integral part of a network of excellence in ethical finance: besides being a member of the Forum per la Finanza Sostenibile and EUROSIF, Etica Sgr is part of ICCR and a signatory of PRI (Principles for Responsible Investment) and CDP (ex Carbon Disclosure Project).

The company was the first Italian asset manager to sign, in 2015, the Montréal Carbon Pledge, which is the initiative that involves a commitment to measure and report the carbon footprint of its investments.



Natixis Investment Managers assists investment professionals by providing them with solid expertise to build better portfolios. It benefits from the experience of more than 20 specialist asset management companies worldwide. Natixis Investment Managers is one of the largest management companies in the world¹ (AUM 909 billion USD*).

Natixis IM is firmly committed to pushing the sustainable finance debate forward. Therefore, it is an active contributor in a select number of forums: World Economic Forum – Alliance of CEO Climate Leaders; Investor Leadership Network; Focusing Capital on the Long Term; Ceres; IIGCC (Institutional Investors on Global Climate Change); One Planet Sovereign Wealth Fund initiative.

Natixis IM is committed to investing responsibly as defined by the Principles for Responsible Investment (PRI), supported by the United Nations incorporating ESG considerations in investment analysis and decision-making processes and being an active owner incorporating ESG issues into its ownership policies and practices.

Natixis IM is a PRI signatory and all of its affiliates recognize these principles; most of its affiliates are also PRI signatories in their own right (covering 94% of AuM).

1. In the Cerulli Quantitative Update, Global Markets 2020, Natixis Investment Managers ranked 17th in the world in terms of assets under management as at 31 December 2019.

*Source: Natixis IM (31/03/2020)



UBS Asset Management is a large scale investment firm that offers wealth management, asset management and investment banking solutions on a global and regional scale. Present in Italy for over 10 years, UBS Asset Management offers a wide range of investment styles and strategies. With assets under management of approximately \$928 billion (as of 30/06/2020¹), it is one of the most important investment companies in Europe and one of the largest operators of hedge funds and real estate investments in the world.

With over twenty years of investment experience to create a better and more sustainable world, UBS AM is committed to integrating the concept of sustainability into every aspect of its investment approach, recognizing the climate change challenges faced by investors and the necessity to achieve a holistic, forward-looking approach to tackling the uncertainties and obstacles of climate change.

With the help of some specific tools, UBS AM helps to include sustainability and impact investing concepts in UBS's offer, that includes: active equities, fixed income, hedge funds, infrastructure and private equity, real estate and passive strategies.

1. Source: UBS Asset Management

TABLE OF CONTENTS

Executive summary	8
Introduction	12
1. Analyzing climate-related financial risks	15
1.1. Methodologies for analyzing climate-related financial risks	16
1.2. The role of supervisory authorities	20
2. Reporting climate risks and impacts	25
2.1. Corporate climate reporting	26
2.2. Transparency of financial products and processes	35
Focus: the banking sector	39
Focus: the insurance sector	45
3. Aligning investment portfolios to climate goals	51
3.1. Climate finance for mitigation and adaptation	52
3.2. Strategies and instruments to reduce the adverse impact of investments	57
3.3. Strategies and instruments to finance activities with a beneficial impact on climate	58
3.4. What to invest in: the taxonomy as a guide for identifying priority sectors	64
4. Financing the energy transition	71
4.1. State of the art of the “energy” sector	72
4.2. The decarbonization of the European electricity market	73
4.3. The decarbonization of the Italian electricity market	76
4.4. Hydroelectric and electrochemical energy storage	83
4.5. The role of hydrogen	83
5. Financing other mitigation and adaptation solutions	93
5.1. Farming and forest	94
5.2. Sustainable transport and mobility	108
5.3. Sustainable cities and construction	116
5.4. Digital technologies	120
5.5. The circular economy	123
6. The importance of the Social factor	135
Conclusions	148
Bibliography	149

EXECUTIVE SUMMARY

The *Sustainable Climate Investments* handbook highlights the crucial role of sustainable finance in view of achieving climate mitigation and adaptation targets. **The current COVID-19 pandemic crisis should not overshadow the issue of climate change.** Besides, healthcare and environmental aspects are closely connected as altering ecosystems increases the risks to human health, whereas protecting biodiversity and countering global warming are beneficial. Moreover, investing in decarbonization can help stimulate the economy in the aftermath of the crisis triggered by the pandemic.

Urgent action and considerable investments are necessary through private and public partnerships, in order to deliver on the commitments undertaken with the Paris Agreement and achieve climate neutrality by 2050 (as provided for under the EU Green Deal and confirmed by the EU Next Generation recovery plan).

Hence, financial resources should be geared towards transitioning to a low-emission economic model. To this end, investors should analyze Environmental, Social and Governance (ESG) data and information, such as the level of exposure to **climate-change related risks** or the type and intensity of **the impacts of corporate activities on the environment**. Climate reporting is increasingly important for companies, not only because it facilitates access to finance and investments but also and above all because it enables them to identify such risks and impacts as are significant for corporate activity; based on this foundation, companies can draw up effective management strategies and identify new development opportunities. In addition to this, reporting improves relations with stakeholders and corporate reputation. Still, in order for investors to be able to compare the performance of different companies, data disclosure must be clear, reliable and based on shared criteria. For the time being, though, there is no such thing as a universally recognized standard. However, this handbook provides a review of the most effective and widely used methodologies.

The data provided by companies can be essential for sustainability reporting in the financial sector. The European Commission has established clear rules on the **transparency requirements of financial players** in terms of integrating ESG themes in investment policies, products and advisory activities, in view of a greater protection of final investors. Given the growing importance of sustainable finance within the European regulatory framework, starting from the 2018 Action Plan, this handbook illustrates the measures undertaken to improve transparency and gear capitals towards such activities as are consistent with mitigation and adaptation targets and highlights the strengths and criticalities of the current framework for the banking and insurance sectors.

For financial players, climate change entails both risks and **opportunities**, with the latter coming from transitioning to sustainable development. Between 2017 and 2018 (public and private) **climate finance** flows averaged \$579 billion

per year globally, up 25% over 2015-2016. Notwithstanding this, more efforts are needed. The IPCC estimated that between 2016 and 2050 \$830 billion will have to be invested each year in addition to current investments for energy-related initiatives so as to cut by 45% hazardous emissions by 2030 and hit the zero-emissions target in 2050 – with both of these conditions having to be met in order to curb temperature rise to within 1,5°C. Aside from volumes, more criticalities come from the areas requiring action to be taken. As a matter of fact, until now **most climate-related investments** focused **on mitigation initiatives**, but many are becoming increasingly vocal on the **importance of adaptation strategies** for the environment and the economy alike. As such, in order to ensure optimal management of risks and opportunities and effectiveness of the actions taken, **it is essential for each investor to define its own strategy for embedding climate change** in investment decisions. The global strategy can be implemented through **multiple approaches and instruments** that are capable of **reducing the adverse impact of investments** (engagement; divestment; exclusions) and of **financing such activities as are beneficial climate-wise** (green bonds, including sovereign bonds; transition bonds; sustainability linked loans; energy efficiency mortgages; thematic investments; best-in-class stock selection; impact investing; climate-related benchmarks).

Having regard to the **sectors** in which to focus investments through the strategies and instruments mentioned above, financial players can refer to a common classification through the **European taxonomy of environmentally-sustainable activities**. In particular, this handbook identifies six priority areas for achieving climate goals: energy, farming and forests, transport and mobility, cities and construction, digital technologies and the circular economy.

With respect to the “**energy**” compartment, an emphasis is placed on the essential contribution to mitigation targets, pointing out the existing European policies aimed to decarbonize the electricity market with reference to the penetration of renewable energy sources and energy efficiency. An in-focus section delves into the Italian electricity market and Public Purchase Agreements (PPAs) – these being long-term agreements that regulate the supply of electricity between a producer and a purchaser. Other areas of intervention for decarbonizing the energy sector refer to hydroelectrical and electrochemical storage and sustainable hydrogen.

With respect to **farming and forests**, this handbook highlights their profound interconnection and their complex relation with climate: while mitigation actions associated to these two sectors are effective and strategic for countering the climate crisis, with 29% of annual CO₂ emissions being retained by forests and other terrestrial ecosystems, the farming and forestry sector is one of the main contributors of greenhouse gas (GHG) emissions, accounting for an estimated 24% of the total (or 37% considering the entire agri-food industry chain). The guidelines for investing in farming integrate sustainability and thus include divestment from supply chains and companies linked to deforestation, especially in tropical areas,

as well as an analysis of investable companies based on the presence of goals to improve climate performances. In order to invest in the forestry sector, instead, one can acquire the stocks of companies that operate in this field, including through thematic funds, or acquire and/or manage forest areas; as such, whether one chooses to act directly or indirectly, standards and certifications are available to bring forestry management in line with sustainability criteria.

In relation to **transport**, sustainable investments can support electrification, energy efficiency and shared mobility, thus contributing towards reducing the environmental impact of this compartment that currently accounts for one fourth of total GHG emissions within the European Union. The main proportion of these emissions originates from road transport, followed by civil aviation and transport on waterways.

A less polluting mobility is a priority also for designing future **cities**, considering that by 2050 over two thirds of the world population will be living in urban areas. Unless this transformation is adequately governed, it can entail severe adverse impacts on the environment and society. For this reason, investing in smart city models that use and integrate digital technologies, urban greeneries, energy monitoring and saving, soft and shared mobility is a priority. One key element, amongst others, is decarbonizing the **construction sector**: according to Eurostat, buildings account for 40% of overall energy consumption and 36% of GHG emissions, mainly originating from construction, use, renovation and demolition. At present, approximately 75% of the European real estate assets are inefficient energy-wise: the renovation of existing buildings could reduce the EU energy consumption by 5-6% and CO₂ emissions by approximately 5%.

The Next Generation EU plan for the post-COVID-19 recovery focuses on accelerating the green and digital transition so as to make the economy more resilient. Even though the **digital sector** is not free from environmental criticalities (mainly related to the processes for manufacturing technological devices and the high energy consumption of the Internet), digital solutions can indeed encourage the circular economy, support the decarbonization of all sectors and reduce the environmental and social footprint of the products marketed in the EU, thus contributing towards achieving the climate neutrality goal.

Transitioning to the circular economy is one of the environmental goals of EU Regulation 2020/852 adopted in June 2020 that sets forth the taxonomy of environmentally sustainable activities. A number of delegated acts of the European Commission will specify the technical screening criteria based on which economic activities help achieve each of the six environmental goals identified: mitigation of and adaptation to climate change; sustainable use and protection of water and sea resources; transitioning to the circular economy, including a reduction of the waste cycle; prevention and control of pollution; protection of the biodiversity and health of eco-systems. This handbook highlights the profound **interconnection among the various facets of sustainability** and hence the need

to invest in circular solutions also in order to reduce GHG emissions and curb global warming. Indeed, the way in which the existing system of extraction and production interacts with natural resources and commodities is the main cause of most energy consumption and ensuing GHG emissions. A circular economy, i.e. one that is regenerative and capable of optimizing production processes, would enable to save commodities and materials; reduce energy consumption and emissions; maintain the energy embedded in products and maximize its value; increase potential carbon sequestration through the regeneration of natural systems.

Finally, this handbook examines the **social aspects of climate change** and their relevance in terms of finance, risks (for example, damage to health, more inequalities and involuntary migrations) and opportunities (in terms of just transition and greater resilience of companies and human societies).

In conclusion, **sustainable finance is crucial for achieving climate goals** through strategies and instruments that are capable of integrating ESG and, in particular, the “climate factor” in investment choices, in view of finding the resources necessary for financing mitigation and adaptation solutions. Only through a renewed public-private partnership and decarbonization-oriented post COVID-19 recovery plans will it be possible to seize the opportunity of sustainable development, thus improving the response of companies and societies to future crises. Starting from an awareness of the profound interconnection among the different facets of sustainability, those financial players that integrate ESG criteria will be able to significantly contribute to the success of climate action.

INTRODUCTION

Climate change is a global challenge that requires a global response. The 2015 Paris Agreement aims to limit the average rise in the Earth's temperature to well below 2°C compared to pre-industrial levels, targeting 1.5° C, which requires a substantial engagement to reduce GHG emissions.

The healthcare, social and economic crisis linked to the COVID-19 pandemic should not overshadow the climate crisis. In the first place, **extreme events linked to global warming and deterioration of ecosystems are clear** and impact the life of a growing number of people; besides, climate change will increase the risks to human health, as highlighted below.

Prior to the present pandemic-related crisis, climate change had emerged as one of the most relevant themes, in terms of both attention from the public (including during catastrophic events such as floods, droughts and fires) and mobilization of new generations with the so-called “climate strikes” – and public policies with the launch of the European Green Deal. As a matter of fact, the latest edition of the *Global Risks Report* of the World Economic Forum (2020) identified in the risks linked to climate change (extreme weather, loss of biodiversity, natural disasters) the main threats to the global economy. This comes as no surprise considering the fast-paced effects of climate change and the overall inability of international policies to limit GHG emissions and global warming to within the targets identified by the scientific community.

2019 closed a decade marked by exceptional warming as a result of which average temperatures were almost certainly the highest on record since 1850. According to the World Meteorological Organization - WMO (2019), since the 1980s, every decade has been marked by higher temperatures compared to the previous decade. Indeed, the special report of the Intergovernmental Panel on Climate Change - IPCC (2018) outlines an extremely alarming picture, with scientists concluding that the 1.5°C rise in the Earth's temperature could occur as early as from 2030, with particularly severe consequences in terms of increase in the frequency and intensity of extreme weather events (such as floods and prolonged drought), glaciers melting, sea level rise and loss of biodiversity.

Besides, **failure to achieve climate targets would imply considerable economic damage**. It has been calculated that, with a 3°C warming, the costs in terms of change in global GDP would attain almost \$4,000 billion annually until 2100, due to phenomena such as sea level rise and loss of farming productivity, in addition to adverse consequences on human health, on the demand for energy as well as on tourism flows. With an average temperature rise of 4°C, this would go up to \$17,500 billion, equal to over 20% of the 2018 world GDP (Kompas, Pham and Che 2018).

As regards finance, there is an **increasing awareness of the importance of**

climate change in the processes of analysis and management of financial risks. For example, central banks and supervisory bodies are working out methods for measuring and assessing the level of integration of the “climate factor”, taking account of its relevance for the stability of global financial systems. In addition, there is a growing attention on the effects of financial processes on climate, according to the notion of “double materiality” suggested by the latest update of the non-binding guidelines on the disclosure of information on climate change of the European Commission (June 2019 – see p. 30).

Until now, financial players have focused on calculating CO₂ emissions and on the average global temperature rise as indicators of climate change. Still, there are equally important factors to be integrated in the decisions and evaluations of investors, such as the loss of biodiversity and the increase in inequalities due to the uneven exposure to the risks linked to climate change, with consequences on the issue of involuntary migrations that are far from negligible.

Based on the foregoing, **Forum per la Finanza Sostenibile (Italian Sustainable Investment Forum – ItaSIF) has set up, in collaboration with WWF, a working group** in order to study the contribution of sustainable finance towards achieving international climate targets. This handbook puts together the contributions from the meetings held in the first half of 2020, thus carrying on the effort started in 2016 that resulted in the publication of *Finanza sostenibile e cambiamento climatico* (FFS 2016) (Sustainable Finance and Climate Change).

As already pointed out on other occasions (Bicciato, Lovera and Casarsa 2020), the role of sustainable investments has become even more important in the present crisis linked to the COVID-19 pandemic. The Next Generation EU recovery plan has reinstated the European commitment to achieve climate targets¹ and pointed out the direction for a recovery that is capable of combining economic development, protection of the environment and social inclusion. As such, sustainable finance, which in recent years has grown significantly in terms of assets under management and relevance in European policies, provides an essential contribution: indeed, **SRI tools and strategies enable to integrate climate change in investment choices and can strengthen public-private partnerships** so as to find the resources necessary to finance mitigation and adaptation solutions.

The pages below are meant to provide guidance on the processes used to analyze (Chapter 1) and report (Chapter 2) the risks and impacts linked to climate and align investment portfolios to the decarbonization of economies (Chapter 3). As climate change entails both risks and opportunities for investors and

1. In Next Generation EU, the European Commission defines the EU Green Deal as “Europe’s growth strategy”. This means that all public and private investments for recovery will have to contribute towards achieving the environmental and climate targets set in the EU Green Deal and be in line with the priorities established in the Community strategy.

enables the latter to support the transition to a low-carbon model by financing mitigation and adaptation solutions, the emphasis is placed on priority areas for action such as energy (Chapter 4), cities and construction, transport and mobility, digital technologies and the circular economy (Chapter 5). Social aspects are also examined (Chapter 6), in terms of repercussions of climate change on human populations and success of climate action in view of the just transition.

1.

Analyzing climate-related financial risks



In order to select the issuers to be included in their investment portfolios, investors who are sensitive to the issue of climate change should analyze company information such as the level of exposure to climate-related risks or the type and intensity of the impacts of corporate activities on the environment.

Investors can **analyze the information disclosed by companies** by using **proprietary methodologies and/or through firms specializing** in the collection and analysis of data and which can provide **ESG ratings**, i.e., a concise opinion that expresses the strength of an issuer, a security or a fund from the point of view of sustainability performance. As a given issuer can be assigned different ratings based on the methodology of evaluation used, investors often consider multiple ratings.

Chapter 1 proposes a classification of the main methodologies for analyzing climate-related financial risks (§1.1.) and a review of the initiatives taken by supervisory authorities in view of integrating ESG risk, and in particular climate-related risks, in financial processes (§1.2.).

1.1. METHODOLOGIES FOR ANALYZING CLIMATE-RELATED FINANCIAL RISKS

Riccardo Spani, Researcher, Fondazione Eni Enrico Mattei

The risks arising from climate change, classified in physical risks and transition risks by the Task Force on Climate-related Financial Disclosures (TCFD) established by the Financial Stability Board in 2017, have started to become increasingly important in the financial world and among issuers.

In the wake of the initiatives promoted by national and supranational institutions, a growing number of financial players is implementing a reporting system for **aligning their portfolios to the targets of the Paris Agreement**. In particular, the most significant exercise concerns the consistency of decarbonization trajectories, but adjustment to regulatory standards is, in some regards, a considerable burden for corporate processes.

In this regard, several initiatives have been taken to ease the integration of this aspect in investment strategies. In the main, these initiatives have been promoted by service providers that play a fundamental role in the financial world, operating and analyzing a large amount of data that is often not publicly available.

As mentioned earlier, the risks considered follow the TCFD classification and service providers generally align their approaches and methodologies to this scheme. Portfolio evaluation schemes often follow different rationales which mostly depend on the final users, the targets set and the types of risks analyzed. For ease of understanding, two groups can be identified: approaches aimed to estimate physical risks and approaches aimed to estimate transition risks.

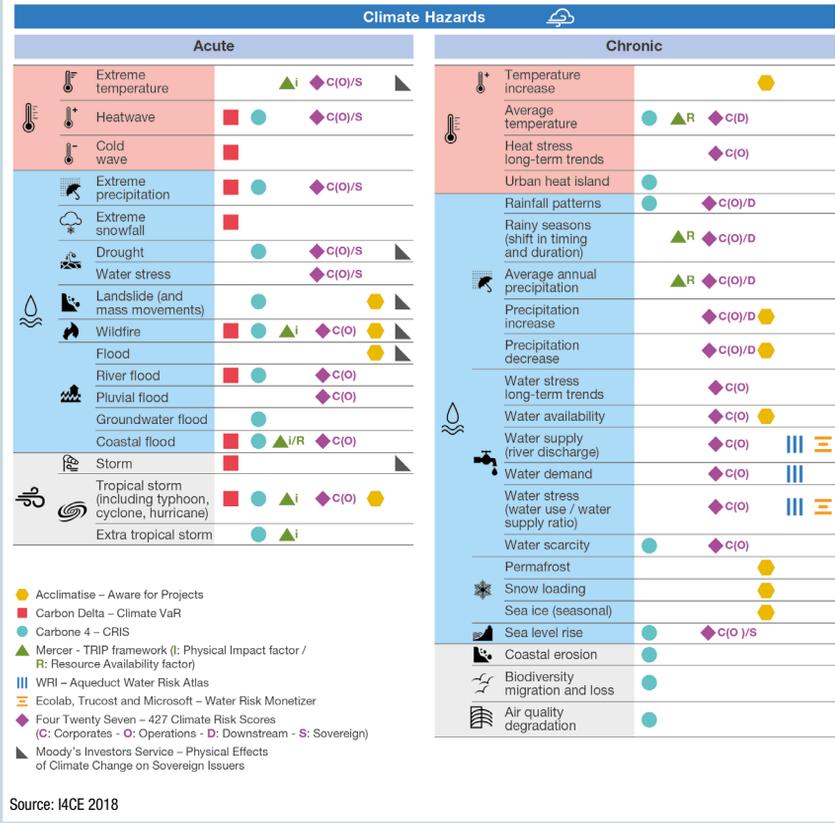
Physical risks

Multiple physical risks have arisen from climate change and not all methodologies go in the same direction. For example, **some tools evaluate the impact of acute risks only** (such as heat waves or floods), whereas **others analyze chronic ones only** (average temperatures or annual precipitation).

In addition, **different types of risk** fall in the same category, such as is the case of temperature abnormalities that only some methodologies consider and among those that do, some analyze heat waves but leave out cold waves.

Figure 1 provides a concise but not exhaustive picture of the risks examined by some tools.

FIGURE 1. Climate-related risks



The methodologies used for evaluating physical risks also differ in terms of **time scale**. For example, the approaches developed by Acclimatise and Four Twenty Seven analyze **past events**; some tools focus on **present climate conditions** only whereas others focus on **future risks** and in so doing use both estimates and the analysis of climate scenarios.

Finally, the last main difference concerns the **methodologies used for calculating the counterparties' exposure to climate risks**, which analyze individual issuers rather than just the country in which they operate. In this case, criticalities differ by type of entity examined. For example, companies can be very diversified and this makes it very difficult to identify their exposure through value-chain tracking. Financial institutions do not have a large amount of data relating to assets and value chain. Finally, as regards sovereign counterparties, the main problems arise when it comes to aggregating different analytical frameworks.

In the first two cases, a **single-project approach** is preferred, which is more convenient in terms of geographic scope and resolution, whereas in the third case **climate risk profiles are produced which are compatible with existing economic, financial and social strength indicators**.

Thus, in order to avoid these **problems of data granularity**, **two approaches** have been developed, both of which aim to extract information on a regional scale in order to derive information useful for:

1. **the use of models specifically designed for a given geography** or that are capable of providing specific data on a given geography (for example, there is one model that covers the entire French territory with a 12 km resolution);
2. **the combination of global models and data relating to statistical relations between the parameters and variables to be calculated** (NASA, for example, uses the data contained in IPCC climate models and applies it to a given geography with a resolution of approximately 25 km²).

Finally, the counterparties' exposure to physical risks also depends on the **location of physical assets** and the components of the value chain. While the upstream phase³ uses a country- or sector-level analysis, operational and downstream phases⁴ use asset- or revenue-specific methodologies.

Besides this widespread bottom-up approach, a top-down one is also used, which **identifies the sector to which the company analyzed belongs** in order to analyze sector sensitivity and combine it to the reference climate scenarios. This avoids having to handle a large amount of data relating to the value chain of the counterparties examined.

Transition Risks

As regards **assessing the impacts of transition risks on portfolios**⁵, in contrast with what happens with physical risks, it is worth noting the strong **forward-looking** connotation that makes it indispensable to use **scenario analysis** in order to calculate exposure to such risks.

As with physical risks, here as well the approaches proposed by service providers can be either **top-down or bottom-up**. However, due to time being central, the most widely used approaches are **mixed** ones.

2. For more information: <https://go.nasa.gov/3jeLO3w>

3. In general, upstream refers to initial operational phases for the supply of raw materials. In the Oil&Gas industry, for example, these typically refer to prospecting and the early stages of production.

4. Downstream refers to processing of the raw materials from the upstream phases to make finished products. In the Oil&Gas industry this generally refers to crude oil refining.

5. A concise, though not exhaustive, overview of the instruments developed to estimate the impact of the risks arising from climate change and their characteristics refer to the relevant web page of the website of the Principles for Responsible Investment (PRI): <https://bit.ly/33cEX5h>

1.2. THE ROLE OF SUPERVISORY AUTHORITIES

For financial players it is increasingly important to measure the exposure of portfolios to climate and environmental risks. Indeed, over the last five years, there has been an increasing awareness of the importance of these themes for the **stability of the financial system**. There have been at least three turning points: first, the signing of the Paris Agreement and the release of the 2018 IPCC report that outlines the catastrophic consequences on human activities of a global warming exceeding 1.5°C by 2100. Finally, another significant event was the speech delivered in 2015 by the then Bank of England Governor, Mark Carney, who spoke of the connection between climate change and financial stability using the expression “tragedy of the horizon” (Carney 2015).

A report released in January 2020 by the Bank for International Settlements and the Central Bank of France compared the climate crisis to a “green swan”, i.e., an exogenous and disruptive event impending on the stability of markets (Bank for International Settlements and Banque De France 2020). According to the report, **climate change poses new challenges for central banks, supervisory and regulatory authorities**, which can manage such risks within the province of their mandates for the protection of financial stability. However, this mission is particularly complex, in that climate change is a **constantly evolving phenomenon** that involves **a complicated series of dynamics and chained reactions**. The risk assessment methodologies based on an analysis of past events (so called, backward-looking methodologies) and the economic models currently used for analyzing climate are not very useful in view of anticipating future scenarios in a sufficiently accurate manner. Therefore, the report highlights the need to develop **predictive calculation tools** (so-called, forward-looking) that are capable of anticipating the possible evolutions of climate change by associating to each scenario the corresponding economic and financial risks.

Among the actions that central banks can take to effectively manage climate risks are the following:

- **carbon pricing**, i.e., set a price that reflects the climate risk associated to the securities of high-GHG-emissions economic activities;
- **integrate sustainability in financial practices and accounting systems** (e.g., reporting the GHG emissions of companies through the Greenhouse Gas Protocol methodology);
- adopt **new balances in prudential regulation⁶ and between monetary and fiscal policies**, so as to factor in climate risks;
- develop **new financial cooperation mechanisms** internationally,

6. Prudential rules mandate that financial institutions set aside capital for the management of possible risks that might lead the institution to insolvency and generate instability in the financial system.

consistently with art. 9 of the Paris Agreement; for example, the Coalition of the Ministers of Finance for Climate Action, established in 2018, involves 50 countries based on six principles (“the Helsinki Principles”): alignment, sharing, effective carbon pricing, climate accounting in public economic and financial policies (e.g. in fiscal planning), mobilization and engagement.

Central banks and supervisory authorities show a growing activism to counter climate change especially in the following areas: 1) development of good risk management practices; 2) monetary policy; 3) stress testing.

Development of good risk management practices

Supervisory and regulatory authorities are increasing their efforts to improve the understanding and measurement of the effects of Environmental, Social and Governance (ESG) factors and of the climate factor in particular, on financial activities and the stability of markets. The **Network for Greening the Financial System (NGFS)** established in 2017 is rapidly expanding. It is a network of central banks and other supervisory authorities aimed to enhance the value of good practices and analyze in depth the management of climate risks by the financial industry⁷. For example, the European Central Bank (ECB) took action on this theme (2020b) and submitted to public consultation a guide in order to illustrate how banks should transparently disclose, integrate in their business policies and effectively manage climate and environmental risks.

Monetary policy

An increasingly growing number of **central banks** is taking **initiatives aimed to integrate environmental and climate criteria in their mandates and in monetary policies**, i.e., actions aimed to influence the cost and availability of money in the economy, for example by modulating interest rates.

At the beginning of 2020, the President of the ECB, Christine Lagarde, stated that environmental sustainability will be analyzed and discussed as part of the monetary policy review of the Eurotower (ECB 2020a). On September 22, 2020, the ECB announced that starting from January 2021, the bonds with a coupon linked to environmental sustainability targets will be admitted as collateral for credit provision transactions and for the securities purchase programs introduced following the COVID-19 pandemic. Environmental sustainability targets must be identified in the EU taxonomy of environmentally-sustainable activities and the UN 2030 Agenda. Other central banks, such as for example the Bank of England, are considering similar initiatives (Khalaf and Arnold 2020). Still, several environmentalist organizations call for a greater commitment by central banks to

7. For more information: <https://www.ngfs.net/en>

sell high-emission securities and prefer green purchases; detractors point out that it is up to political authorities to give directions on the economic activities to be favored or penalized.

Stress testing

Several central banks and supervisory authorities have been considering to **include climate change risks in stress tests**, i.e. in the periodical simulations aimed to assess the capital strength of financial institutions⁸.

In December 2019 **the European Banking Authority (EBA) published an action plan on sustainable finance** in which it stated the need to develop common methodologies for measuring the vulnerability of banks to environmental and climate risks and prefiguring the introduction of stress tests (EBA 2019).

A similar initiative has been announced by the **Bank of England**: the Prudential Regulation Authority (PRA) and the Financial Policy Committee should have conducted a biennial exercise to assess exposure to climate change of British banking institutions (Bank of England 2020a). However, in May 2020, the kick-off was postponed to mid-2021 to allow banking institutions to focus on the management of the economic and financial crisis brought about by the COVID-19 pandemic. In June 2020, the PRA published the results of the stress tests conducted in 2019 on **insurance companies**, which comprised information on the exposure of such companies to risks that are difficult to assess, including those relating to climate change. When disclosing its findings, the PRA pointed out that the companies so tested **needed to improve capacities, tools and data to calculate climate risks** (Bank of England 2020b).

A number of interesting results were collected relating to **stress tests conducted in specific financial sectors**. In 2019, the **European Insurance and Occupational Pensions Authority (EIOPA) included ESG risks in its biennial simulations on the strength of pension fund investors**⁹. They found that the portfolios of pension schemes are invested in high-GHG activities (to the extent of 37% as regards equities and 10% as regards bonds); the carbon footprint of equity investments (i.e. the CO₂ emissions of investee companies) exceeds the EU economy average (0.37 kg against 0.26 kg per euro in terms of added value), whereas bonds have a lower carbon footprint (0.22 kg per euro in terms of added value). Even though the majority of schemes introduced measures to identify those ESG risks that are relevant for investment decisions, there still is wide

8. Stress tests are simulation techniques aimed to assess the capital strength of financial institutions and investment portfolios in the case of specified disruptive events or situations. By aggregating the results of individual financial institutions, supervisory authorities can assess the risk of the entire financial system and reference market.

9. Besides climate change, the assessment also considered the legal and reputational risks linked to social aspects (e.g., noncompliance with the regulations that protect the workforce or damage caused to the local communities) and governance risks (e.g. fraud, corruption or tax evasion). The 2019 simulation involved 176 pension fund investors in 19 EU member states (those with a market exceeding €500mn); in most countries, the players involved account for 50-60% of the market.

room for improvement: as little as **30% of the schemes analyzed introduced sustainability risk management processes** and as little as **19% are capable of measuring the impacts of ESG factors on risks and returns**. Another interesting finding relates to the definition and identification of Sustainable and Responsible Investments (SRI): 22% of respondents had difficulties and 16% had a hard time finding adequate investments (EIOPA 2019). In addition, the scenario is far from homogeneous: the ability of individual players to measure themselves with sustainability risks also depends on country-level development in relation to this theme. In Italy, for example, the survey on SRI policies of pension plans – conducted by ItaSIF since 2015¹⁰ – have recorded an increase in the sensitivity of players to the importance of managing ESG risks.

In 2018 the Dutch Central Bank analyzed the consequences of energy transition on the financial stability of the country. Other central banks and supervisory authorities are working out their own methodologies, such as is the case in France and Denmark; in 2021 the Australian Prudential Regulation Authority (APRA) will analyze the vulnerability to climate risk of the largest authorized deposit-taking institutions (APRA 2020). At the end of July 2020 a group of 72 organizations – including investors with an AUM close to \$1 billion – wrote a letter to the Federal Reserve asking for more incisive action on climate change (Durkee 2020).

Even though in the early months of 2020 a number of institutions announced that they had postponed the start of these projects so as to focus on the management of the pandemic, financial players are by now aware of the relevance of environmental and climate aspects.

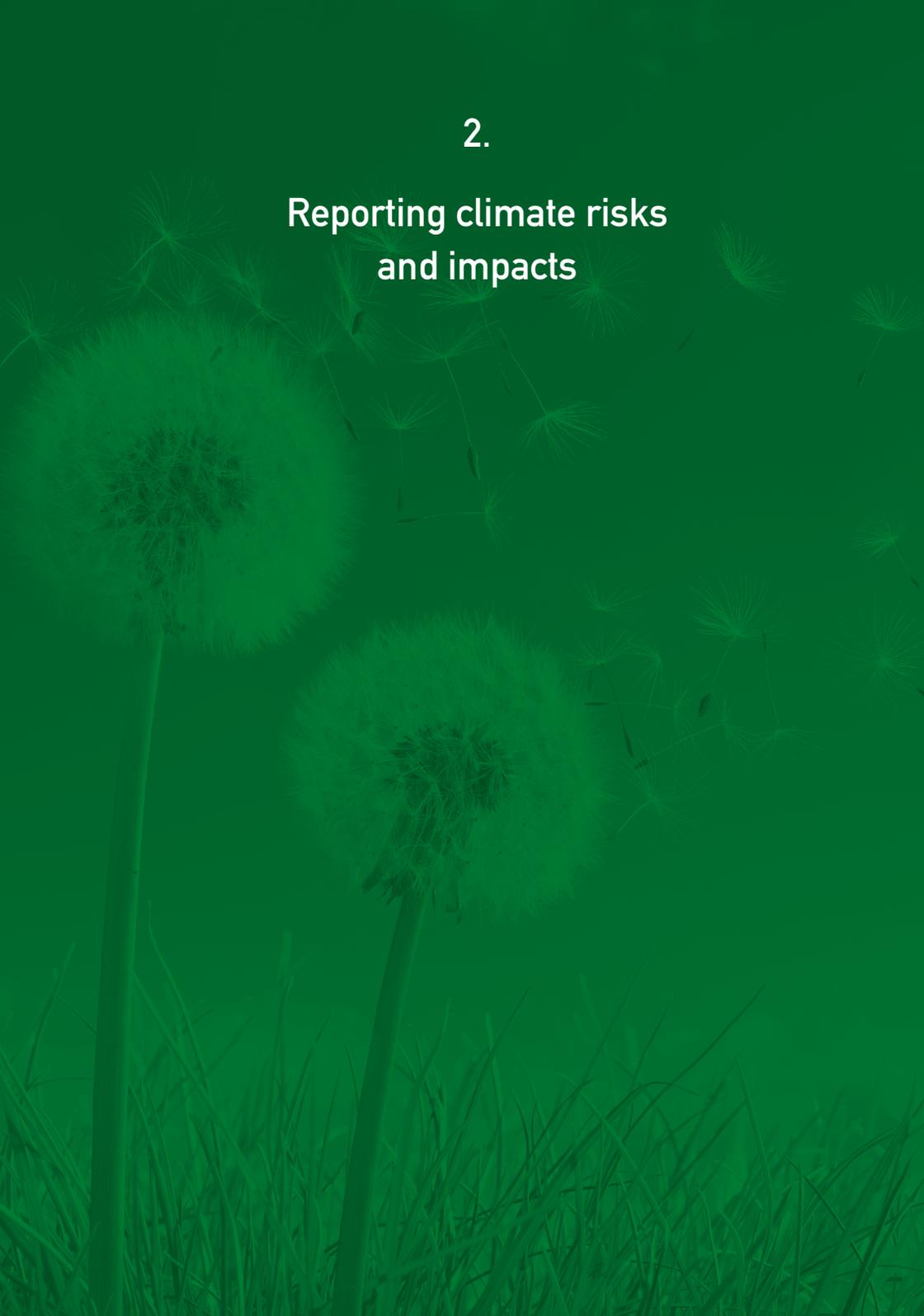
THE COMMITMENT FOR CLIMATE OF THE BANK OF ITALY

The Bank of Italy, a member of NGFS, announced in 2019 that it had adopted SRI strategies for managing its equity funds (namely the exclusion approach based on the UN Global Compact principles and the best-in-class selection). The Bank of Italy stated that the reason for this choice was the willingness to select companies that are more innovative, efficient and able to manage more effectively climate-related risks. In the speech that publicly launched this turning point, the governor Ignazio Visco declared that “the effects of climate change on the real economy can propagate to the financial sector through multiple channels. [...] In the event that the scale of these effects becomes relevant, the very stability of the financial system could suffer” (Visco 2019).

10. The study, promoted by ItaSIF in collaboration with Mefop and MondoInstitutional, is available on the FFS website: <https://finanzasostenibile.it/tipo-attivita/ricerca/>

2.

Reporting climate risks and impacts



Chapter 2 addresses the reporting of climate risks and impacts. As the quality of the information disclosed by financial players depends in the first place on the data provided by the companies to be invested in, financed or insured, this chapter sets out to analyze the reporting methodologies and standards available to companies (§2.1.) and then moves on to illustrate the actions taken within Europe to improve the transparency of financial products and processes (§2.2.). Finally, it deep-dives in the banking sector and the insurance industry, through the voice of their respective Italian associations ABI and ANIA.

2.1. CORPORATE CLIMATE REPORTING

As regards **companies**, climate reporting is an increasingly relevant activity, not only because it facilitates access to ESG finance and investments but also and above all because it enables to identify the risks and impacts of corporate climate-related activities. Based on this, companies can work out effective **management strategies** and identify **new development opportunities**. Finally, reporting is also beneficial in terms of improving relations with stakeholders and corporate reputation. In 2017 93% of the top 250 companies worldwide drew up sustainability reports (KPMG 2017).

However, in order for investors to be able to compare the performance of different companies, the disclosure of data must be **clear, reliable** and based on **standard criteria**. At present **there is no such thing as a universally recognized standard**; however, some methodologies are considered to be particularly effective by companies and investors and are therefore widespread.

Standards can deal with sustainability themes in general, such as the Global Reporting Initiative Sustainability Reporting Standards (GRI Standards) and the standard of the Sustainability Accounting Standard Board (SASB); alternatively, they can focus on themes related to the environment and climate, as is the case with the recommendations of the TCFD and the methodology of the CDP (formerly Carbon Disclosure Project).

METHODOLOGIES AND STANDARDS FOR SUSTAINABILITY REPORTING

Global Reporting Initiative Sustainability Reporting Standards - GRI Standards

www.globalreporting.org

GRI Standards are good practices that companies can follow when disclosing information on their economic, environmental and social impacts and on their contribution to sustainable development. They are published by the Global Reporting Initiative, an international organization headquartered in Holland that supports companies with their sustainability reporting. In particular, these standards are worked out by the Global Sustainability Standards Board (GSSB) with the engagement of stakeholders. First published in 2000, they are continuously updated and added to: in fact, their structure and contents are flexible, such that they can reflect the market evolutions and adapt to the requirements of companies and investors.

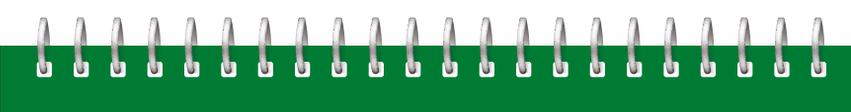
These standards fall into two categories: **three universal standards** (GRI 101, GRI 102 and GRI 103), that can be used by all organizations; **34 standards for specific economic** (GRI 200 series), **environmental** (GRI 300 series) and **social** (GRI 400 series) topics. Environmental topics include: **materials; energy; emissions; water management; biodiversity; waste management; compliance with / infringement of environmental rules; supply-chain management**. Depending on its needs, each organization can draw up its reporting using all standards (in which case the report is “GRI-compliant”), or disclose information on specific topics.

The Italian version was published in September 2019.

Sustainability Accounting Standard Board - SASB

www.sasb.org

SASB is an independent organization established in 2011 and headquartered in the United States. Its 77 standards vary depending on the economic sector to which a company belongs and aim to guide organizations in identifying, managing and disclosing **financially relevant sustainability information**. In this regard, SASB has built a “**materiality map**”: for each sector and economic activity it enables to identify the sustainability factors that are material for over 50% of companies, those that are such for less than 50% of companies and those that are not material. Sustainability refers to the environment, the social capital, the human capital, the business model and innovation; leadership and governance. The environment comprises: **GHG emissions; air quality; energy management; water and wastewater management; waste and hazardous substance management; ecological impacts**. In addition, “business model and innovation” addresses the theme of the physical impacts arising from climate change.



In July 2020, GRI and SASB announced a collaboration aimed to provide more information to companies (as to how to use the two standards so that one supplements the other) and to investors (as to how to interpret the commonalities and differences in the information provided under the two methodologies) (SASB 2020).

Task Force on Climate-related Financial Disclosures - TCFD

www.fsb-tcfd.org

The TCFD was established in 2015 by the Financial Stability Board (FSB), i.e. the body that promotes and monitors the stability of the world financial system, with the task to work out a set of **non-binding recommendations on the reporting of climate-related risks**. The task force was chaired by Michael R. Bloomberg and consisted of 32 experts representing companies and organizations of the financial system. The aim of the TCFD was to provide guidance to companies as to how to align the disclosure of information to the expectations and requirements of investors.

In 2017 the Task Force published **11 recommendations falling in four thematic areas: governance, strategy, risk management, metrics and targets**. These recommendations are based on a **classification of risks and opportunities related to climate change**. Risks fall into two groups, by type: physical risks and transition risks. The latter include legal, reputational, technological and market risks. Opportunities have been identified in the following areas: efficient use of resources; selection of energy sources; production of low-environmental-impact goods and services; access to new markets; resilience (TCFD 2017).

According to the latest report, dated 2020, over 1,500 organizations worldwide expressed support for the TCFD methodology.

CDP (former Carbon Disclosure Project)

www.cdp.net

CDP is an independent, not-for-profit international organization headquartered in Berlin, Germany, that **offers to investors, companies, countries, regions and cities a system to measure, survey, manage and share information on their environmental impact**, with a view to encouraging them to take mitigation actions. The CDP methodology is based on a questionnaire to be filled out by those companies that, based on the answers provided, receive an assessment. With this activity, CDP has set up an important database of information for investors to use.

There are **three types of questionnaires: climate change, water and forests**. The **climate** questionnaire comprises 14 modules: **governance; risks and opportunities;**

business strategy; targets and goals; emissions (measurement methodology and data); process used to verify emissions data; energy; carbon pricing (i.e., the economic value given by the company to CO₂ emissions); **engagement; other metrics**. The questionnaire includes specific questions for specified high-impact sectors. The questionnaire is continuously updated, including in view of aligning the methodology to other widely used standards: for example, a recent review concerned the alignment to the TCFD recommendations.

In 2020, over 515 investors with an AUM of \$106,000 billion required companies to disclose information using the CDP methodology.

Other international standards have been established by the United Nations, the OECD and European institutions:

<p>Sustainable Development Goals - SDGs www.un.org/sustainabledevelopment</p>	<p>Among the 17 SDGs, all of which are closely interconnected, the one that refers to climate change most expressly is 13 “Climate Action”.</p>
<p>Global Compact www.globalcompactnetwork.org/it</p>	<p>The principles relating to environmental themes are: support a preventive approach to environmental challenges (VII); take initiatives that promote a greater environmental responsibility (VIII); encourage the development and spread of technologies that respect the environment (IX).</p>
<p>OECD Guidelines for Multinational Enterprises www.oecd.org/daf/inv/mne/MNEguidelinesITALIANO.pdf</p>	<p>Article VI deals with environmental themes.</p>
<p>ISO Standards www.iso.org/iso-26000-social-responsibility.html</p>	<p>Having regard to the environment, the ISO 14001 standard introduced in 2015 enables to build a system for managing environmental risk.</p>
<p>Eco-Management and Audit Scheme - EMAS ec.europa.eu/environment/emas/index_en.htm</p>	<p>Mechanism introduced by the European Union to support companies and other organizations assess, report, improve and certify their environmental performances.</p>

The European Directive on Non-Financial Reporting and the guidelines on climate

In the European Union, large companies and groups are required to publish regular reports on the social and environmental impacts of their activities, in compliance with **EU Directive 2014/95 on Non-Financial Reporting (NFRD)**. The NFRD applies to **large public-interest companies¹¹ with at least 500 employees**; at present, approximately 6,000 companies must comply with the NFRD (listed companies, banks, insurance companies and other companies qualified as being “public-interest” companies by national authorities).

In Italy the NFRD was transposed by **legislative decree 254/2016** and entered into force effective as from January 1, 2017. Pursuant to its provisions, these companies are required to report information on the policies adopted, the results achieved and impacts generated on the environment¹² and society, on personnel, on the respect of human rights and to counter corruption. The non-financial report can be included in the report on operations or in a separate document. The companies that do not apply specific policies in one or more of the areas mentioned by the Directive must give reasons for this according to the **comply or explain** principle.

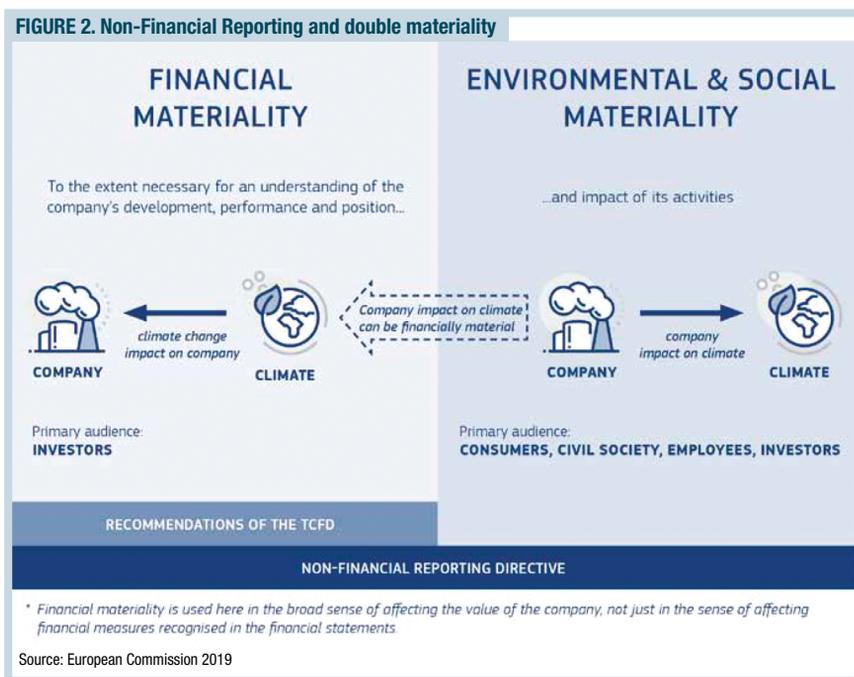
In June 2019 the European Commission published the **guidelines for companies on disclosing climate-change information**: this non-binding guidance adds to the guidelines accompanying the NFRD since June 2017. This initiative is one of ten actions under the Action Plan on sustainable finance and the Technical Expert Group (TEG) on Sustainable Finance helped draw up the text of the guidelines.

With this document, the **Commission added to the TCFD recommendations** in the European regulatory framework and introduced the **notion of double materiality**. In particular, the TCFD recommendations focus on financial materiality, i.e. on the effects of climate change on enterprise value; the NFRD approach, instead, focuses on the impact of corporate activities on sustainability-related themes. These guidelines add to the two approaches and explain the notion of double materiality.

11. As regards Italy, legislative decree 254/2016 provides that NFR is mandatory for Significant Public-Interest Companies, as defined under article 16 of legislative decree 39/2010, exceeding the above-mentioned requirements in terms of size: Italian companies issuing securities listed on an Italian or EU regulated market, banks, insurance and reinsurance companies, securities trading companies, asset managers, etc. The full list is available at: <https://bit.ly/2ZkbLXx>

12. As regards environmental themes, under art. 3, c.2, the decree specifies that the company is required to provide information on: “a) the use of energy resources, with separate indication of those produced from renewable as opposed to non-renewable sources, and the use of water; b) GHG emissions and emissions of pollutants in the atmosphere; c) the impact, if possible based on realistic hypotheses or scenarios including mid-term, on the environment, health and safety, associated to the risk factors under sub-section 1, letter c), or other relevant environmental and health risk factors”.

FIGURE 2. Non-Financial Reporting and double materiality



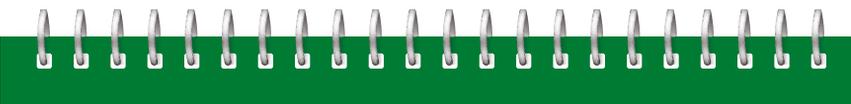
The Commission guidelines suggest that companies also align to other reporting standards such as the GRI and SASB standards and specify which information on climate it is important to report in each of the five areas under the NFRD: 1) business model; 2) corporate policies and due diligence procedures¹³; 3) policy outcomes; 4) risks and their management; 5) **Key Performance Indicators (KPIs)**. One of the most important elements of the guidelines is the introduction of KPIs with units of measure and practical examples on factors such as: GHG emissions; the definition of emission-reduction targets; total consumption and/or production of energy from renewable and non-renewable sources; energy efficiency targets. Furthermore, this document contains an annex that provides specific indications for banks and insurance companies.

In the declaration on the EU Green Deal, the European Commission announced a **review of the NFRD** aimed to improve corporate sustainability reporting and have higher-quality data for investments. To this end, a public consultation¹⁴ was conducted between February and May 2020. The new version of the Directive is scheduled for the end of 2020.

13. According to the guidelines, companies should report information on the role of the Board of Directors and management in defining climate-related company policies and, in particular, on climate-change-related risks and opportunities.

14 For more information: <https://bit.ly/35N2b3u>

CONSOB too is active on the front of non-financial reporting: in September 2020 it launched a public consultation on the obstacles and benefits arising from it so as to increase the number of voluntary non-financial reports.



EFRAG: QUANTIFYING CLIMATE SCENARIOS

Andrea Gasperini, AIAF Head of Sustainability and ESG Observatory
EFRAG former member of the European Lab Project Task Force on Climate-related Reporting
EFFAS CESG commission on ESG issues, part of the Expert team of EFFAS Certified ESG Analyst

Among the key initiatives under the EU Action Plan on Financing Sustainable Growth presented on March 8, 2018, Action 9 provides for “Strengthening sustainability disclosure and accounting rule-making” and requires the European Financial Reporting Advisory Group (EFRAG) to set up a European corporate reporting Lab to promote innovation and the development of best practices relating to company reporting, including environmental accounting.

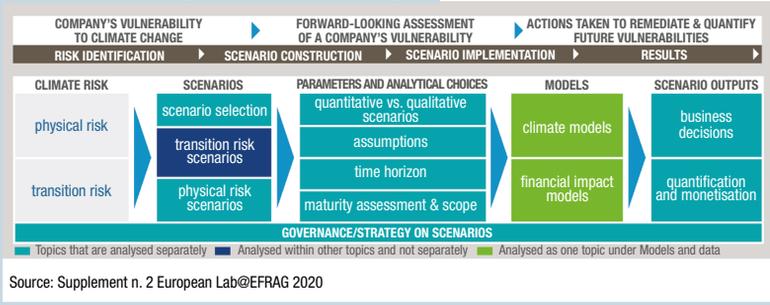
The Lab’s first project was the setting up of Task Force Lab@EFRAG PTF-CRR¹⁵ which, in February 2020, after one year of work, presented in Brussels the report ***How to improve Climate-Related Reporting*** comprised of a basic report and two supplements¹⁶.

Supplement #2 includes a review of the reporting practices of the “Scenario Analysis” of a targeted sample of companies from across the world, with an emphasis on European ones. The scenario analysis is the area of climate-related reporting that companies find most difficult to handle. In order to provide in-depth information on scenario analysis, Lab@EFRAG PTF-CRR focused on **identifying good practices for analyzing the scenarios** that might inspire companies to also adopt the TCFD recommendations (2017). The scenario analysis comprises ten pre-defined building blocks as shown in Figure 3.

15. Brussels, February 15, 2019: EFRAG announced that the European Lab steering group appointed its 23 members, with Michele Lacroix as chair, of the Task Force for its first project on climate-related reporting (the PTF on Climate-Related Reporting), selected from among a large number of candidates from a vast range of stakeholders and national contexts. All the members appointed have practical experience and know-how on the climate-reporting of companies of different sizes, users (analysts and investors), the accounting profession, the civil society, universities and other electorates. Members from Italy are Andrea Gasperini (Head of the Sustainability area and ESG Observatory of AIAF), Giulia Genuardi (Head of Sustainability planning and Performance management of ENEL) and Elena Flor (Head of Corporate social responsibility of the Intesa Sanpaolo group).

16. European Lab@EFRAG - Project Task Force on Climate-Related Reporting: <https://bit.ly/3mvJION>

FIGURE 3. The building blocks of scenario analysis



Scenario outputs: Building Block #10 Quantification and Monetization

As highlighted under “Quantitative and Qualitative Scenarios” and “Hypotheses”, **only some companies quantify their scenarios**¹⁷. The few scenarios quantified often correlate with the business outlook or market development, but only rarely are they specifically calculated for the company itself.

Having regard to the companies that disclose specific corporate approaches, these are often identified through a sensitivity analysis with which the company identifies only one risk/opportunity factor. The most advanced companies also monetize the potential impact on the company.

The perspective of the preparers of company reports

A number of preparers indicated that **oftentimes it is necessary to reach a compromise in terms of disclosure transparency so as to curb the risks of competitors’ initiatives**. Overly detailed information on quantitative scenarios can turn out to be inappropriate in some situations, in that they may entail confidentiality/competitiveness issues. In the event of there being confidentiality issues, companies can provide aggregate information only.

In addition, reporting opportunities in the scenario analysis might potentially entail controversies with the users of the information (for example investors) to whom it is not always clear that such opportunities might not necessarily materialize. Issues in terms of legal and confidentiality risk are also highlighted under “Quantitative and Qualitative Scenarios”, “Hypotheses” and “Scenario Outcomes and Company Decisions”.

17. Quantification and monetization of scenario outputs:

- BHP Billiton 2015, *Climate Change: Portfolio Analysis*, pp. 13-14: <https://bit.ly/36mw1w8>
- Equinor 2018, *Sustainability Report 2018*, p. 18: <https://bit.ly/2HHFMzt>
- AXA 2019, *Climate Report 2019*, pp. 17, 19, 24: <https://bit.ly/2Gn9GD0>

The perspective of the users of company reports

Different users of the information (for example investors) consider quantitative scenarios to be complementary to qualitative scenarios and have also indicated **insufficient quantification and non-comparability of the scenario analysis inputs and outputs**.

Some users expressed concerns about the use of non-comparable scenarios among different companies and/or sectors. This is particularly problematic in the absence of a precise definition of the underlying hypotheses and of a connection between the hypotheses of the company scenarios and those of the most well-known external reference scenarios, such as for example the Sustainable Development Scenario of the IEA (2019b).

The activity conducted by the PTF-CRR consisted also in engaging stakeholders so as to gain first-hand detailed information on good reporting practices (and potential areas of improvement). Any other practice and example of reporting of which the stakeholders were aware as a result of their professional experience were also collected. An open invitation to participate in the research was addressed to stakeholders from a variety of professions, including, amongst others, preparers, users, the academia and NGOs. A total of 48 interviews were conducted by the PTF-CRR. Set out below are some of the expectations pointed out by the users in relation to reporting the outputs and impacts of the scenario analysis.

- While a **graphic illustration of the impacts** (e.g., circles of different sizes and color coding) can be useful, users find it difficult to refer to these illustrations without explanatory quantitative data. Many graphic illustrations tend to be company-specific and not comparable with those of other companies or even across different reporting periods for the same company. Hence, graphics/images should come with **quantitative data to enable comparisons**.

- Some users highlighted the importance of the **hypotheses relating to the scenario analysis and expect them to be aligned with the information disclosed in the financial statements**. This is even more true of the information that potentially correlates to risk results. Moreover, the very International Financial Reporting Standards (IFRS) require that material risks be reflected in financial statements information.

The hypotheses according to which there should be an alignment between the scenario and financial statements information include: i) hypotheses of a value reduction as in the case of raw materials and discount rates projections; ii) costs and liabilities due to exposure to physical risk; iii) provisions and iv) the time horizon of asset depreciation and amortization.

Still, alignment of the financial statements to the reference scenario would not apply to all cases, in that scenarios are neither forecasts of the future nor a projection of the exposure of a given company. However, scenarios should reflect plausible results



and, where appropriate, an alignment between the scenario and financial statements information can help users assess the risk profiles of companies.

- Finally, some users prefer **scenario analysis outputs that consider the most variable effects that interact at the same time**, including adverse effects, rather than just the outputs derived from sensitivity analyses that consider the effects of one factor at a time.

Conclusioni

Companies should consider the difficulties of users in analyzing scenarios when the results are only shown by charts and other visual illustrations without explanatory tables that could ease comparative analyses. What could help is a representation that easily connects scenario reporting information to related data presented in the form of tables so that the information is immediately accessible and comparable by users (for example in order to compare similar data among different companies). Finally, where available, year-over-year comparative data is useful to enable a comparison of trends.

2.2. TRANSPARENCY OF FINANCIAL PRODUCTS AND PROCESSES

As part of the Action Plan on sustainable finance¹⁸, the European Commission has introduced **clear common rules on the transparency requirements of financial players** in relation to the integration of ESG themes in their investment policies, products and advisory activity. The goal is **a greater protection of final investors** by improving the information available to them so as to improve their awareness when making investment choices.

EU Regulation 2019/2088¹⁹, adopted in 2019, requires that financial advisors and institutional investors disclose:

- if and how the investment choices and products on sale in Europe integrate considerations on ESG risks;
- if and how they factor in the adverse impacts of their investment policies on the environment and social themes.

The Regulation rests on three pillars:

- **the goal of curbing the risk of greenwashing**, i.e. the marketing strategy

18. For more information: <https://bit.ly/3khdCnA>

19. For more information: <https://bit.ly/2U6RMbZ>

adopted by some companies with a view to emphasizing the policies or achievements relating to sustainability in order to build a positive, but deceptive, image of their environmental impact;

- **level playing field**, as requirements apply to different areas of financial services rather than to specified products or entities;
- **regulatory neutrality**, which indicates that the different players of the financial market are required to apply rules in an identical manner. The harmonization and convergence of the methods of implementation will be managed by the European Banking Authority (EBA), the European Insurance and Occupational Pensions Authority (EIOPA), the European Securities and Markets Authority (ESMA), as well as by their joint committee.

The **financial areas** that are subject to the Regulation are:

- (open and alternative) investment funds;
- insurance based investment products (life insurance products with investment components available in the form of individual retail life policies and collective life policies);
- private and occupational pensions;
- individual portfolio management;
- insurance and investment advice.

Having regard to **financial entities**, investors and advisors are required to disclose:

- information on the policies for integrating sustainability risks in investment choices and in the advisory activity;
- information on the adverse effects of investment decisions on sustainability;
- information on the consistency of remuneration policies with the integration of sustainability risks.

This information must be disclosed **in the website of the entity**.

Investors and financial advisors must specify how risks are integrated in investment decisions and how they can impact the returns of their financial products. If sustainability risks are not considered to be relevant, it is necessary to give clear, concise reasons for this. This information must be disclosed in the pre-contractual disclosure.

Having regard to products investors are also required to clarify if, and if so, how, a financial product factors in the main adverse effects of investments on sustainability factors; here again, the comply or explain principle applies.

In addition, the Regulation identifies two specific categories of products:

- financial products that **promote environmental and social characteristics**;
- financial products that **have sustainable investments as their objective**.

In these cases, information must be disclosed on how the characteristics have been complied with and how the targets declared have been achieved. If a

benchmark is designated, it is necessary to explain if and how the benchmark is consistent with these characteristics or in line with the target. Transparency on the sustainability characteristics of these products is required in: pre-contractual information, the website and periodic reporting. These rules apply effective from March 10, 2021.

In order for these provisions to be implemented by investors, they require technical specifications referred to as **Regulatory Technical Standards (RTS) on which the joint committee of the European Supervisory Authorities (ESAs)** is working. At the end of April 2020, the ESAs published the draft RTS (ESMA 2020) specifying the contents, methodology and manners of presenting ESG disclosure, for both financial institutions and products. This document has been submitted to public consultation until the end of September; the final version of the RTS is expected by the end of 2020.

The provisions relating to pension funds add to the disclosure requirements under EU Directive 2016/2341 on the activities and supervision of Institutions for Occupational Retirement Provision known as IORP II. The Directive was transposed in Italy by legislative decree 147/2018 in force from February 1, 2019.

The taxonomy of environmentally-sustainable economic activities

As illustrated in the paragraphs above, EU Regulation 2019/2088 and RTS provide details on the categories of financial players that are required to disclose information on ESG themes and how they should do it.

As regards **the contents of disclosure**, environmental and climate-related themes are detailed in **EU Regulation 2020/852** adopted in June 2020 which introduced in the European regulatory system **the taxonomy of environmentally-sustainable activities**, i.e., a common European classification of economic sectors and activities that can be considered to be environmentally sustainable. To be more precise, the classification sets out **for each economic activity the technical criteria based on which it contributes towards achieving the environmental and climate-related goals of the European Union**. The Regulation specifies six goals:

1. climate change mitigation;
2. climate change adaptation;
3. sustainable use and protection of water and marine resources;
4. transition to a circular economy;
5. pollution prevention and control;
6. protection and restoration of biodiversity and ecosystems.

In order for an activity to be environmentally-sustainable, it has to:

- **substantially contribute to at least one of the six goals;**
- **do no significant harm;**
- be carried out in agreement with **minimum social safeguards** (for example,

the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights).

A number of **delegated acts of the Commission** – that is to say, technical rules that do not require the vote of the Parliament– will set out in detail the **technical criteria** based on which the economic activities contribute towards achieving each goal. The delegated acts on mitigation and adaptation will be adopted by the end of 2020 and will operate from January 2022; those relating to the other goals will be introduced within 2021 and will operate from January 2023.

The contents of delegated acts will refer to the **report produced by the Technical Expert Group (TEG) on Sustainable Finance** (2020a) in March 2020 with proposals as to how to select economic activities, which criteria should be considered for each activity and how companies and investors will have to disclose the degree of alignment to the taxonomy of their activities and financial products. In addition, the TEG has made practical proposals for the classification of economic activities and in respect of technical criteria for the goals of mitigation and adaptation.

In the coming years, the European Commission will be assisted by a **Platform on Sustainable Finance** (European Commission 2020c), an expert group to advise on the technical criteria for screening economic activities as well as on updating and developing the taxonomy. Besides, the Commission can address the representatives of the Member States through the **Member State Expert Group on Sustainable Finance**²⁰.

Based on the **recommendations provided by the TEG** (2020a), those investors that will disclose a financial product according to the taxonomy will be required to disclose:

- which environmental goal(s) it contributes to;
- the proportion of assets that comply with the taxonomy.

In order to make this calculation, the TEG suggests to consider:

- for equity portfolios, the issuer's turnover;
- for fixed-income portfolios, the Capital Expenditure (Capex), the company's expenditure for purchasing long-term goods and/or services (for example, to finance its growth projects)²¹.

EU Regulation 2020/852 will also apply to the companies that are subject to the NFRD: by June 1, 2021, the Commission will adopt a delegated act to provide more details as to how companies are required to disclose information on the basis of the taxonomy. The guidelines on the disclosure of climate-related information (see pp. 30-31) already suggest that companies disclose the

20. For more information: <https://bit.ly/394XVff>

21. If useful for the purposes of disclosure, the TEG mentions the possibility to calculate the Operational Expenditure (Opex), that is to say the organization's expenditure during the process of managing and maintaining revenue-generating assets.

percentage of turnover or Capex that contributes to the goals of climate-change mitigation and adaptation.

The extension of the scope of application of the taxonomy to companies will help improve the data available to investors to precisely calculate, hence disclose, the degree of alignment of financial products to the taxonomy.

FOCUS: THE BANKING SECTOR



CLIMATE-RELATED FINANCIAL RISKS AND REPORTING: INSIGHT INTO THE BANKING INDUSTRY

Claudia Pasquini, Head of Risks, Controls and Sustainability, ABI

Angela Tanno, Risks, Controls and Sustainability, ABI²²

European institutions are working full speed ahead to develop sustainable finance, that is to say to increase existing and future capital flows for the development of sustainable economic activities, with a focus on climate change. This long-time commitment has been renewed and set in the context of the challenges posed by the COVID-19 emergency to production and the economy.

The regulatory measures that are an integral part of the 2018 European Commission Action Plan on Financing Sustainable Growth were approved; in particular, we refer to the Regulations on disclosure²³ and taxonomy²⁴. The phase of definition of the related Regulatory Technical Standards and delegated acts is currently underway and banks, in their capacity as stakeholders, are raising substantial questions that are still open and on which it is necessary act in order to speed up the development of the supply and demand of financial products in line with the goals of sustainable finance.

As regards the information that banks are required to disclose, it is necessary to **harmonize** the various regulatory requirements. Besides, in terms of **availability and accessibility of data**, there is a substantial mismatch between the current requirements of European regulations and the practical possibility for banks to fulfil their obligations, in particular in terms of data made available by their counterparties (that is to say the companies that borrow funds).

Having regard to this, one should consider that Art. 8 of the Regulation on taxonomy states that there will follow further specifications from the European Commission, which, by means of a delegated act, by June 1, 2021, will specify

22. ABI ("Associazione Bancaria Italiana") is the Italian banking association.

23. EU Regulation 2019/2088 relating to sustainability disclosure in the financial services sector: <https://bit.ly/3kbRJ9q>

24. EU Regulation 2020/852 relating to establishing a framework that encourages sustainable investments and modifies EU Regulation 2019/2088: <https://bit.ly/2lehhW1>

the contents and presentation of the information required to be disclosed in NFR, including the methodology to be used, taking into account the specificities of non-financial companies and the technical screening criteria required to be complied with under this Regulation.

That said, while it is unclear whether the disclosure required under the above-mentioned Article 8 concerns all of the investment financial products made available or, in general, all of the bank's activities, including loans, it is however clear that in any case Non-Financial Disclosure is not sufficient for drawing from the data that Europe requires from financial markets participants, including banks – and this both in terms of scope of application and level of detail of the information required.

Alongside the information required under the taxonomy Regulation, one should also consider the new requirements of prudential regulations that represent or will represent for banks different levels of information required, as will be explained later below in more detail.

Therefore, **clarity is necessary as to the information (KPIs and related methodologies to be used) and as to exactly what banks are required to disclose** so as to avoid overlapping and redundancies.

The proposals of the banks

*In order to guarantee pertinent and reliable disclosure, **the scope of the contents of mandatory disclosure should focus on a set of key indicators:***

- *that should be **shared by other regulations on ESG disclosure**²⁵ (for example the Capital Requirement Regulation 2 - CRR2, pillar 3, taxonomy, disclosure, benchmarks, NFRD and supplementary guidance of the European Commission on climate-related information²⁶, the recently published ECB/SSM guide on environmental and climate-related risks);*
- *that **may not be published before the data is available from client companies (disclosure on Scope 3).***

*In particular, with respect to the SME, the EU should require a **minimum set of ESG data** providing few pieces of information on environmental profiles (consistently with the metrics of the taxonomy, possibly in relation to simplified (at least initially) test thresholds), and social profiles, possibly segregated by economic activity (as for example the geolocation data of facilities for assessing physical risk). One should also consider that countries with a higher concentration of SMEs have to tackle particularly difficult challenges in pursuing sustainable investments (which depend, amongst others, on the availability and reliability of data); public authorities*

25. The ECB as well, in paragraph 2.7 of the document reporting its contribution to the consultation for the review of NFRD, hopes for a comprehensive review of the disclosure of ESG factors under the different prudential rules and regulations in an attempt to eliminate inconsistencies and redundancies.

26. An upcoming opportunity to align the different disclosure requirements will be the update of the NFRD, scheduled in the early months of 2021.

and financial institutions should cooperate in order to identify mechanisms to **integrate traditional sources of credit for the SMEs that operate in the green economy with more sophisticated financial instruments** that allow for a longer-term vision; in this regard, the emerging solutions to be considered might include fintech, crowdfunding for sustainable projects and impact financing, potential synergies as yet unexplored in sustainable finance, such as that of a supply-chain approach (for example, by starting processes of collaboration among companies in the same sector through the joint implementation of innovative projects such as high-energy-efficiency plants in industrial districts, storage/reuse/transformation of process heat).

Financial institutions should therefore be required to report information on the sustainability of their portfolios/activities only if sufficient and reliable information is available. Financial institutions should not be required by law to disclose information relating to organizations that are not subject to mandatory disclosure requirements.

As promoted also through the replies to the Commission's recent consultations on sustainable finance, **ABI requests that the EU acts to support the development of a Hub, accessible to the public free-of-charge, that collects the environmental data and ESG information of companies**, including the data reported as part of the NFRD and other pertinent ESG data. Specifically, ABI is hopeful for a European project to identify the gaps between the information required for the taxonomy on climate change mitigation and adaptation and the information required on the same themes under the NFRD. Open-source information should be preferred.

While the requirement for financial players to disclose non-financial information aims to encourage use of such information in the banking activity in order to drive capital flows towards sustainable economic activities, there is a number of open issues as to the **integration of ESG factors in risk management in the banking industry**. As such, it is necessary to:

1. tackle the limitations of historical data;
2. outline the proper time horizon of the risk models used;
3. find the right level of data granularity;
4. identify pertinent metrics of exposure to climate-related risk;
5. translate the economic impact into financial risk metrics²⁷.

The themes outlined above are at the core of multiple initiatives arisen from the 2018 Action Plan on Financing Sustainable Growth of the European Commission. In particular, Action 8 of the Plan, which provides for the **integration of**

27. Italian Association of Financial Industry Risk Managers (AIFIRM) Report *Climate Change: valutare e far progredire la consapevolezza di un "nuovo" Financial Risk* ("Climate Change: Assessing and Improving the Awareness of a "new" Financial Risk").

sustainability in prudential requirements, has led the novelties introduced by the Capital Requirement Regulation (CRR) and Capital Requirement Directive (CRD)²⁸, the mandate given to the EBA to study the possibility to include ESG risks evaluation in the Supervisory Review And Evaluation Process (SREP), as well as the introduction of reduced capital requirements in case of exposures linked to activities that are beneficial for the environment and society.

The proposals of the banks

Along the same lines, ABI has participated in the project “**Sustainable Finance: High Level Recommendations on the Voluntary Application of the EU Taxonomy to Core Banking Products**”, promoted by the European Banking Federation (EBA) and by the Program for the Environment – Financial Institutions of the United Nations (UNEP-FI). The Project aims to assess to what extent and how **the taxonomy can possibly be applied on a voluntary basis to assess the sustainability of banking portfolios/products** (other than investment products and services) not provided for under the Regulation but for which the taxonomy might in any case become a reference standard (for example in relation to possible reporting and disclosure requirements under prudential supervision).

The project focuses, amongst others, on the following portfolios/products:

- retail loans – for energy efficiency of private homes and e-vehicles;
- corporate loans – for energy efficiency of commercial real estate and corporate loans aimed to environmentally sustainable activities/projects;
- loans to SMEs aimed at environmentally sustainable activities/projects.

Work will include, amongst others, the identification of differences, if any, between existing classification practices developed by banks based on the information available and the EU taxonomy, the evaluation of initiatives already started and to be leveraged on, as well as anticipation of operational constraints and the collection of data sources.

As a contribution to the debate on the feasibility assessment for a prudential treatment dedicated to banking exposures relating to sustainable assets, and hence to the EBA Report on the classification and prudential treatment of assets from a sustainability perspective (Discussion Paper 2022-2024, Final Report by June 2025), ABI has helped lay out the **proposal of a factor to reduce minimum capital requirements named Sustainable Finance Supporting Factor (SFSF)**,

28. Articles 449a and 501c of EU Regulation 2019/876 that modifies EU Regulation 2013/575 as regards the leverage ratio, the net stable funding ratio, the requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements and EU Regulation 2012/648; Art. 98(8) of EU Directive 2019/878 that modifies Directive 2013/36 as regards exempted entities, financial holding companies, mixed holding companies, remuneration, supervisory measures and powers and capital conservation measures.

presented in the course of COP25 in Madrid, Spain, alongside other forms of non-prudential incentives (see **EBF 2019 document “Encouraging and Rewarding Sustainability - Accelerating Sustainable Finance in the Banking Sector”**).

Thanks to the EU taxonomy, we have a reference framework for identifying those economic activities that provide a significant contribution towards mitigating climate change and are well positioned in terms of adaptation. Conversely, no such system is available in respect of those activities that are considerably counterproductive for achieving environmental goals. For this reason, among others, the EBF proposal on the SFSF focuses on supporting, through a proper adjustment of RWAs, those assets that are well positioned in view of the goals embodied by the taxonomy.

In fact, the proposed SFSF applies solely to **Eligible exposures**, that is to say to individual exposures that have at the same time two characteristics (whereas the previous proposal, that was later discontinued, of the Green Supporting Factor - GSF did not include the first characteristic):

- 1. they must be connected to the classes of economic activities/projects mentioned in the EU taxonomy for which a reduction of the credit risk profile has been deemed to be highly likely as a result of their sustainability.** These **eligible economic activities** (also referred to as **eligible asset classes**) can be identified by the EBA in the EBF proposal with the forward-looking methods mentioned above or in any case with partly innovative approaches;
- 2. they must be connected to economic activities that, individually, are compliant with the present and future requirements of the taxonomy** (for now, the taxonomy only considers the two environmental goals that significantly contribute towards mitigating and adapting to climate change, but the SFSF mechanism mentioned above can be extended to the other environmental goals as well as to social ones).

We believe that the **SFSF** can be an important **incentive to quickly and incisively kick off transition processes aimed to develop or increase sustainable economic activities** and hence synergically achieve the goals of stability and sustainability of banks in their lending activities.

At the same time, we wish to point out that the SFSF will be **temporary** in nature: the measure proposed should be considered as a factor meant to correct the (current) inability to integrate in the assessment of sustainable activities their best prospective positioning in terms of riskiness.

The proponents hope to include the proposal in the upcoming Capital Requirements Regulation (CRR3) for which works started recently²⁹.

29. The request has also been included in ABI's reply to the European Commission's "Public Consultation Document Implementing the Final Basel III Reforms in the EU" - January 2020.

Banking supervisory authorities as well are focusing on **climate change** as a **relevant risk for the stability of the financial system**; besides, increasingly more actions have been taken to raise the awareness of the banking sector of these types of risks, to improve their management as decisive factors for the existing categories of prudential risks and with a potential significant impact on the real economy and banks³⁰. In particular, the **ECB** started on May 20, 2020 a **public consultation** to gather feedbacks on the **“Guide to Climate-Related and Environmental Risks. Supervisory Expectations on Risk Management and Disclosure”** (ECB 2020c). The Guide details what the supervisory authority expects from the significant entities that are subject to its direct supervision in terms of management of climate-related and environmental risks in their corporate strategy, governance, risk management and disclosure of banks. It will be interesting to follow this evolution without ever losing sight of the goals in terms of the environment, financial stability and remuneration of the banking business.

30. The Network of Central Banks and Supervisors for Greening the Financial System is taking significant action: <https://bit.ly/3kWy8ut>



As already highlighted in *Finanza sostenibile e cambiamento climatico* (“Sustainable finance and climate change”) (FFS 2016), the insurance sector is highly exposed to climate-related risks. In general, the main challenges come from two types of problems:

- 1. overly expensive premia**, with the increase in claims related to natural disasters and long-lasting extreme weather, insurance companies will be driven to increase premia, such that the cost of policies for customers in highest-exposure areas will be unsustainable;
- 2. difficulty in estimating the risks** related to climate-change events; unless GHGs are drastically reduced, natural catastrophes might happen so unexpectedly as to make it extremely hard to analyze environmental risks and establish premia accordingly.

THE INSURANCE INDUSTRY PUT TO THE TEST BY CLIMATE CHANGE

Pietro Negri, Head of Sustainability and Corporate Governance Code of Italian Stock Exchange, ANIA³¹

Climate change, demographic changes and technological progress are only some factors of the change underway (worsened and accelerated by the pandemic) that pose new major risks for society as a whole. However, the most relevant element, which has influenced the change in the scenario from the 2007 financial crisis, is the stakeholders’ growing focus on climate change, which is forcing companies to re-focus their productive activities towards a more sustainable economic development.

As such, in order to guarantee and maintain over time the creation of value for its shareholders, the financial industry must be able to increasingly and better assess and manage new risks using tools, data and working methods that are more efficient and innovative. The integration of ESG factors in the definition of the companies’ strategic plans, in investment choices, in the innovation of productive processes and in the development of new goods and services, proves to be functional for a better analysis and management of the risks related to the different corporate activities.

The insurance industry contributes significantly to the economy and society and plays a most peculiar role. While it takes on itself the consequences of potential harmful events, the emergence of a (future and uncertain) debt towards the insured requires that it invests the premia collected in advance by stipulating contracts so as to ensure the economic and capital balance of the company. The very principle of mutuality that underlies the insurance business can be said to be partly similar to the principle of equity and solidarity related to the

31. ANIA (“Associazione Nazionale fra le Imprese Assicuratrici”) is the Italian association of insurance companies.

notion of sustainable development. Therefore, **in the insurance sector**, even more so than in other sectors, it has become **fundamental to integrate ESG factors and analysis** in the definition of strategic plans, in risk management, in asset allocation, in the design and sale of new products. The value of the ESG analysis lies in the fact that it provides additional information on top of a traditional assessment of risks and customers' insurance needs. In particular, the information arising from the ESG analysis becomes significant in pointing out the differences between the rating of traditional risk parameters (such as for example credit rating) and the ESG rating. Deep-diving into the ESG areas of an issuer that has suffered a considerable downgrade, for example, can lead to optimal re-focusing of investment choices to arrive at a portfolio with performances aligned with the goals of capital protection that are typical of financial management in the insurance industry. Moreover, assessing ESG parameters is useful in order to enhance the value of the behaviors of the insured and their needs in order to improve products and calibrate at best the offering as compared to a statistical and actuarial assessment.

The Italian insurance sector was strongly influenced by the implementation of **IVASS Regulation 38/2018** on corporate governance, which, under art. 4, subsection 2, requires that the environmental and social risks generated and suffered³² be included among those to be identified, assessed and managed by the corporate governance system. The purpose is to **drive companies to pursue sustainable behaviors** by making choices aimed to create value in the mid-to-long term and focus on the management of aspects that are not exclusively geared to profit³³. Likewise, the remuneration policy, in setting the targets to be achieved, must take account of the non-financial criteria that contribute towards creating value for the company (art. 47 c.2 letter b).

Another major driver for improving knowledge and raising awareness of ESG factors in the insurance industry is the **transposition of EU Directive 2014/95 on Non-Financial Reporting** (see p. 30). From a comparison of the non-financial reports in the insurance sector (nine Italian groups and three European ones) made by ANIA in the 2017-2019 period, a significant evolution has been observed in both the quality of reporting and integration of sustainability in

32. We refer to the risk of financial or reputational losses arising from environmental and social impacts pursuant to legislative decree 254/2016 on non-financial reporting.

33. According to the ninth annual report on the global insurance sector, drawn up by the asset management division of Goldman Sachs, the weighting of ESG factors is growing in the investment choices of insurance companies. In particular, in 2017 most interviewees (68%) did not believe that they had to take account of such factors, whereas in 2020 the proportion of those who are "skeptical" towards ESG parameters ESG declined to 21%. GSAM interviewed 273 Chief Investment Officers (CIOs) and Chief Financial Officers (CFOs) with over \$13,000 billion assets, equal to approximately half of the global insurance sector. Climate risk is present in the investment process in 73% of cases in the EMEA region (followed by 72% for Asia-Pacific and 53% for the Americas). Not only that, though. Indeed, the vast majority of interviewees reported their interest in using climate-related stress testing and scenario analyses in order to measure the exposure of their portfolio to future climate risks. In Europe, approximately one fourth of all interviewees are willing to use this analysis as their primary assessment tool (GSAM 2020).

corporate management. In particular, there has been an increase from five to eight in the number of insurance groups that have entrusted a specific committee with supervising corporate social responsibility (CSR) themes. In four cases, information has also been disclosed on the main sustainability themes addressed during board and/or committee meetings. The companies in the sample examined described as part of non-financial reports their system for monitoring, assessing and managing sustainability-related risks. All of the companies examined are taking actions in order to mitigate ESG risks; there is a strong focus on environmental and climate-related risks. Furthermore, three companies in the sample integrate the recommendations of the Task Force on Climate-related Financial Disclosures and two groups have started a process to define a framework for reporting such aspects. Only a few (five, of which only two Italian) insurance groups have adopted stewardship policies that define how they monitor investee companies in relation to sustainability issues and participate in corporate life through engagement and voting.

In order to boost the role of finance and accelerate sustainable development, the European Commission, as highlighted above, **took several measures** aimed to put ESG considerations at the center of the financial system, so as to facilitate the transformation of the European economy into a greener, more resilient and circular system. On the one hand, with EU Regulation 2020/852, so-called “taxonomy”, a “safe harbor” has been defined for investors and financial intermediaries in the choice of what can qualify as “sustainable investment” environment-wise. On the other hand, responsibility towards clients has been strengthened and translated, with EU Regulation 2019/2088, so-called “disclosure”, into a substantial increase in the fiduciary duty. A direct consequence has been a considerable reduction in information asymmetry through the introduction of the obligation, for financial markets participants (including insurance companies), to provide increasingly more detailed information as to which are the bases used for investment choices, the effects produced and suffered by the investment itself, the Principal Adverse Impact (PAI) and their subsequent monitoring over time. Therefore, in exchange for providing a “taxonomy”, the EU lawmakers have chosen to impose very stringent transparency rules which, however, at present, need more data, and this data needs to be more comparable and authoritative in order for it to be commonly used. Hence the clear connection with the need to create an EU-wide data Platform, to coordinate and extend the scope of application of EU Directive 2014/95 on non-financial information, with EU Regulation 2019/2089, so-called “benchmark”, through the definition of an EU-wide Ecolabel and with the identification of uniform and credible standards for the issuance of green bonds (with the issuance of sovereign bonds being a case apart).

In June 2020, based on the technical advice of EIOPA, a **document** was published to **modify EU Regulation 2015/35 for the Integration of Risks Related to**

Sustainability as part of EU Directive 2009/138 Solvency II³⁴. In the first place, the “principle of prudent person” has been added to by requiring, on the one hand, that when assessing the safety, quality, liquidity and profitability of the portfolio, “sustainability risks” should also be factored in; on the other hand, that companies should consider the long-term impact of ESG factors on investments and refer, where relevant, to the ESG preferences of contracting parties and beneficiaries. Impact analysis has shown a potential increase in the costs for financial intermediaries and distribution networks, due especially to the lack of adequate expertise in the processing and use of relevant information, data and tools for analysis and profiling³⁵.

Likewise, changes have been proposed to the EU Delegated Regulation 2017/2359 (supplementing EU Directive 2016/97 IDD³⁶) during the assessment of the potential conflicts of interest that might derive from considering ESG factors in the distribution activity. Moreover, ESG factors are a fully-fledged component of the set of procedures and information of the so-called Product Oversight Governance (POG), as part of which the information to be collected from customers becomes even more important for the purposes of customer profiling and for verifying whether the product offered is suitable to meet the customer’s needs.

The insurance sector as well has eventually started to focus on these themes (Pedol 2019).

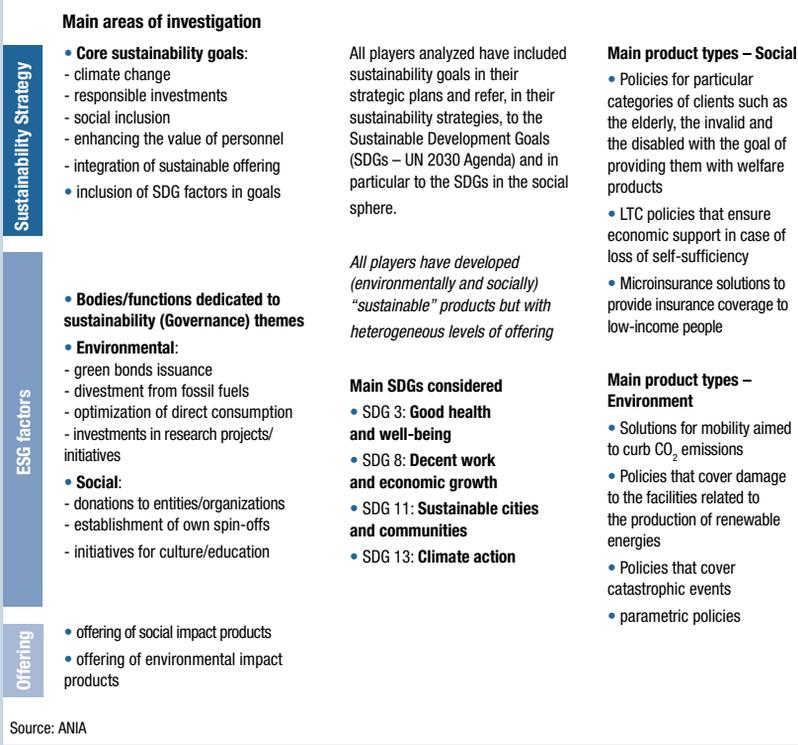
The offering of sustainable or ESG investment insurance products has increasingly grown and based on the analysis conducted by ANIA (February/ May 2020) as to how sustainability is implemented (and in particular, how environmental factors are factored in), the benchmark of leading insurance groups shows significant changes underway, including as regards the integration of these assessments in the field of risk underwriting.

34. EU Directive aimed to extend Basel II provisions on prudential supervision to the insurance sector: <https://bit.ly/30kEnk5>

35. European financial associations, including Insurance Europe, addressed a letter to the Director General of DG FISMA of the European Commission, John Berrigan, to highlight that “the availability of good quality, comparable, reliable and public ESG data is currently rather limited and unable to meet the growing expectations and new regulatory requirements that should apply in the near future”. The information available is likewise hardly comparable. Not to mention, finally, that “the ESG data of third-party providers is often expensive for small financial markets operators, researchers or the academia”. Hence the request of a European sustainability register from the European associations that represent most of those financial investors that will have to contribute to the implementation of the Green Deal launched by the European Commission. The signatories also request a repertoire of non-financial reports of listed companies, data relating to the taxonomy, starting from the climate change data, and all such ESG information as is necessary for investors to be in line with regulations on the sustainability of financial services: <https://bit.ly/32P6IAC>

36. EU Directive that regulates the distribution of insurance products by intermediaries and insurance companies. Like MiFID II, it aims to increase transparency and protection for those who subscribe to insurance investment products: <https://bit.ly/32sKGDa>

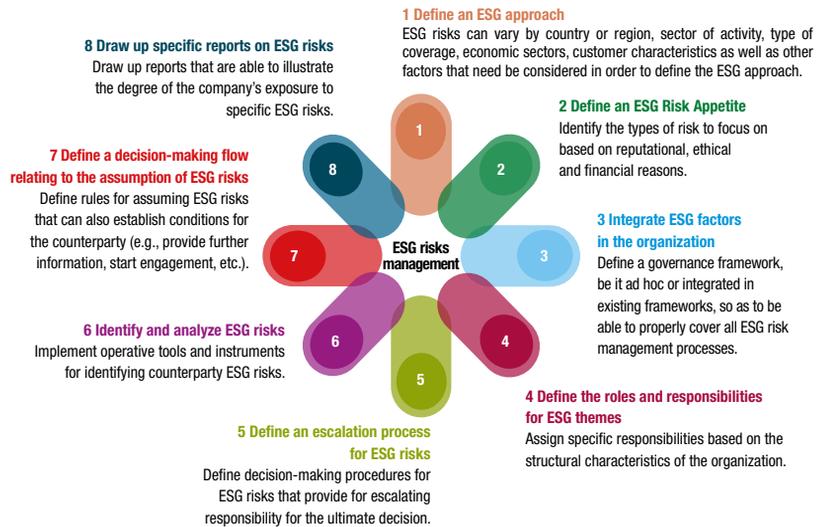
FIGURE 4. Benchmark of the leading insurance players in relation to sustainability



Source: ANIA

FIGURE 5. Possible actions for managing ESG risks according to the UNEP-PSI

In order to be able to properly manage **ESG risks**, during underwriting, an insurance company should:



Source: ANIA

Some ESG themes, such as climate change, have such a broad impact that they would require sector-wide, nation-wide or even continent-wide common strategies³⁷. However, ESG risks can also vary depending on the country or region, activity sector, type of coverage, economic sectors considered, client characteristics, time and the specific risk appetite strategy defined by the board of the insurance company (UNEP 2020).

37. The Emilia Romagna region passed an ad hoc piece of legislation, 7/2019 "Investments of the Emilia Romagna Region for Big Data, Artificial Intelligence, Meteorology and Climate Change". The Big Data Technopole is headquartered at the premises of the former Manifattura Tabacchi of Bologna, the area designed in 1952 by Pier Luigi Nervi, one of the most significant examples of industrial architecture of the 20th century. The project to transform this area into a large scientific hub, covering approximately 100,000 sqm, hosts research activities and high-performance processing infrastructures, including the Data Center of the European Center for Mid-Range Weather Forecasts (ECMWF), an inter-governmental organization established in 1975 by 24 States and based in Reading (UK). The ECMWF develops numerical methods for mid-range weather forecasts and produces and distributes weather forecasts to Member States. In 2017, following a European tender, the ECMWF Council chose Bologna as the HQ of the new Data Center, which will use state-of-the-art supercomputers with a processing capacity 10x that of current ones.

3.

Aligning investment portfolios to climate goals



Chapter 3 focuses on the contribution of the financial sector towards achieving climate goals, highlighting such opportunities as are inherent to the processes of transitioning to a low-emission economic model. In the first place, one should notice that, in order to guarantee an effective management of risks/opportunities alongside a significant impact of the actions taken, it is essential for each investor to define its own **strategy for integrating the theme of climate change in its investment decisions**. Such strategy should:

- formalize the company's commitment and, if at all possible, the practical (qualitative and quantitative) goals it sets out to achieve;
- identify the corporate functions that are responsible for implementing the strategy;
- illustrate such measures as will be adopted to help counter climate change and, to the extent possible, their timing;
- define monitoring processes and relevant KPIs as well as the strategy for disclosing the outcomes in terms of targets achieved.

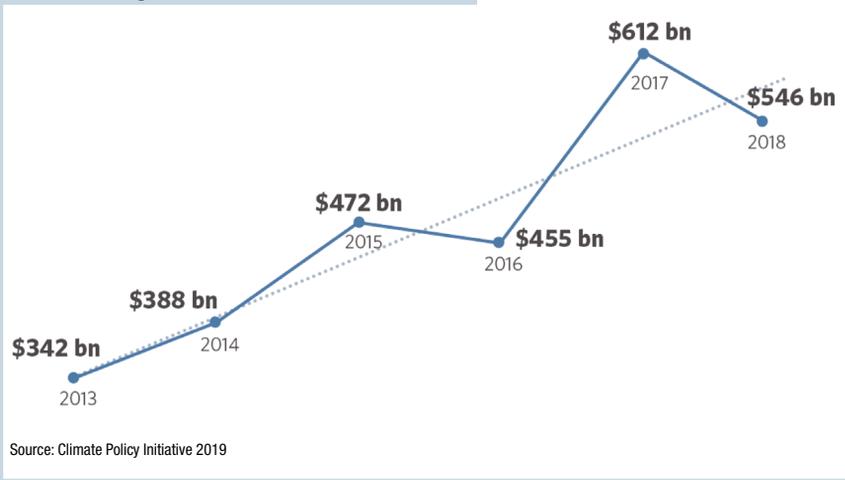
After a general outline of climate finance (§3.1.), this chapter illustrates the strategies and financial instruments with which it is possible to align investment portfolios to the commitments undertaken in the Paris Agreement, reducing the adverse impact on climate (§3.2.) and financing those assets that are beneficial (§3.3.).

3.1. CLIMATE FINANCE FOR MITIGATION AND ADAPTATION

Achieving climate goals requires greater public and private financial efforts. Hence, it is essential to align from now investment portfolios to the commitments undertaken in the Paris Agreement.

According to the Climate Policy Initiative (2019), **between 2017 and 2018, (public and private) average global climate finance annual flows stood at \$579 billion**, up 25% over the 2015-2016 period. More investments focused on low-emission transport; in 2017 climate finance flows were a record-high \$612 billion, driven above all by innovations in the field of renewables in particular in the United States, China and India.

FIGURE 6. Total global climate finance flows 2013-2018



However, so far the efforts of the financial sector are not enough: the **IPCC (2018)** estimated that **between 2016 and 2050 an average \$830 billion will have to be invested each year in addition** to current levels of investments for energy-related initiatives in order to cut by 45% hazardous emissions by 2030 and achieve the zero-emissions goal in 2050 – with both of these conditions having to be met in order to curb temperature rise to within 1.5°C³⁸.

Besides, criticalities concern both volumes and the sectors that require action: until now, **most climate investments have focused on mitigation initiatives**. In the 2017-2018 period, mitigation finance accounted for 93% of total flows, or \$537 billion per year on average. Adaptation finance absorbed 5% of the flows in the same period with the remaining 2% relating to mitigation and adaptation initiatives, significantly up over the 2015-2016 (CPI 2019) period.

However, many point out **the importance of adaptation strategies** for the environment and the economy alike (see box below).

38. An increase of approximately 12% in total investments for the energy sector has been estimated.

CLIMATE-CHANGE ADAPTATION INVESTMENT OPPORTUNITIES

Giulia Galluccio, Senior Researcher and Head Fund Raising Office, Euro-Mediterranean Center on Climate Change Foundation
Eugenio Sini, Researcher, Euro-Mediterranean Center on Climate Change Foundation

The cost of climate change

In the *Global Warming of 1.5 °C* (2018) report, the IPCC maintains it is highly confident that global warming will hit 1.5°C between 2030 and 2052 if we stay on the current trajectory (A.1³⁹), which would result in a higher risk for health, livelihood and food, the supply of water and human safety (B.5).

The report goes on to state that, including in the event of curbing global temperature rise to within 1.5°C – a scenario from which we are currently far – the climate change impact would cost \$54,000 billion. This means that, **even in an optimistic setting in which the States are able to mitigate climate deterioration, we will be facing considerable damage** and will have to adapt in order to limit such damage or even turn it into an opportunity. Having regard to Italy, recent studies (CMCC Foundation 2020) foresee economic damage in the order of 0.5% of GDP with a temperature rise to within 2°C. With an average warming of up to 4°C, the losses of per capita GDP can exceed 2.5% in 2050 and attain 7-8% in 2100.

In macroeconomic terms, it is hard to estimate the overall benefits of adaptation measures. Still, a number of sector-wide studies concerning individual countries point out that benefits can by far outweigh the value of the damage suffered⁴⁰. For this reason, **assessing and implementing adaptation measures is an investment**, for both public authorities and private companies.

Public investments

As regards public finance, the funds expressly dedicated to adaptation are relatively new and mainly concern urgent or short-term measures. Conversely, in the long-term the challenge is to mainstream adaptation in public finance.

This **trend towards mainstreaming adaptation in public finance is already visible in**

39. In the IPCC reports, the “Policymakers Summary” sets out the main conclusions of the report, each with a specific alphanumeric code (for example A.1 or B.5). Each conclusion is associated to an overall assessment of the level of certainty expressed by the scientific community and based on available scientific evidence as well as on their level of agreement (for example, *highly confident*).

40. The UNFCCC reviewed the scientific literature to investigate the approaches used for calculating the benefits of adaptation. An analysis of the United Kingdom alone, limited to adaptive measures for the risk of flooding and coastal erosion, has highlighted that benefits are 5x costs (UNFCCC 2011).



Europe. While the LIFE program, expressly dedicated to climate action and adaptation, has modest resources, significant funds are available through mainstreaming of the theme in the Common Agricultural Policy, the Fund for Rural Development and in the Horizon 2020 research program. Overall, in the 2014-2020 period, the Commission estimates a total climate expenditure of €200 billion, or 18.8% of total budget expenditure.

As regards European Structural and Investment Funds, in addition to national co-financing, **in the 2014-2020 period Italy spent €5 billion for adaptation**, co-financed to the extent of 45% by Italy itself which, more than other European countries, has prioritized this item of expenditure.

According to European rules, Community resources are allocated on a competitive basis. Hence, the local authorities concerned need to have a spirit of initiative and the ability to propose projects that can obtain the resources available, possibly by aggregating multiple opportunities rather than limiting themselves to public finance alone but exploring possible private finance options as well.

Private climate finance

Private climate finance is becoming increasingly important. New financial products have recently surfaced in the market to boost the attractiveness of climate adaptation projects. One solution is **public-private partnerships** to raise private capital for large climate-safe infrastructural works: the presence of public finance is an element of attraction as it enables to mitigate financial risk. In addition, **green bonds** were first launched in 2007, which enable to raise resources aimed at environmental and climate projects; total green bonds issuances have already achieved \$257 billion (CMCC Foundation 2020). Finally, more specialized products are also available, such as **catastrophe bonds** (for the insurance market) and **environmental impact bonds**.

With a view to organizing these numerous activities in the private sector, the European Commission recently approved a Regulation that introduces a European taxonomy for the transparency and standardization of “green” financial products so as to definitely launch sustainable finance, especially ahead of the Commission’s massive investment program for a carbon-neutral EU by 2050. The European Green Deal intends to mobilize over €1,000 billion for climate leveraging private finance as well. The Just Transition Fund (see box “Just Transition Mechanism”, p. 140) is one of the first mechanisms of the Green Deal to inject resources in the market for the re-qualification of high-emission/polluting industries. In parallel to the Green Deal, the European Commission also aims to use the post-pandemic economic stimulus as an additional energy transition tool. Indeed, in the 2020 State of the Union speech, the President of the Commission

NEXT GENERATION EU is the European Union economic recovery plan put in place in the aftermath of the crisis brought about by the COVID-19 pandemic. The plan was presented to the EU Commission on May 27, 2020 and discussed and approved by the Council in July 2020. The aim of these measures is to stimulate growth by accelerating the green and digital transition so as to boost economic resilience. The plan provides for strengthening the 2021-2027 EU budget. The resources appropriated to Next Generation EU amount to €750 billion, which the EU Commission will raise through the issuance of EU bonds and this amount will be paid out by means of loans (€360 billion) and expenditures (€390 billion).

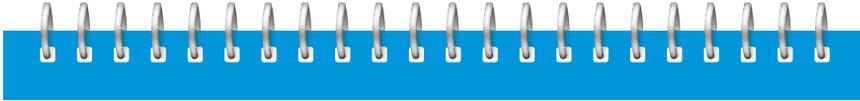
proposed to appropriate 37% of the €750 billion of the Next Generation EU Recovery Fund to the green economy and proposed a substantial increase in mitigation targets.

Apparently, we have all the ingredients needed to bring about in the coming decades an actual change in the development paradigm (a real need for a sustainable transition, social consent and new public and private available resources). As such we can only hope for timely action.

MITIGATION, ADAPTATION AND SUSTAINABLE DEVELOPMENT

The impacts of climate change and responses in terms of mitigation and adaptation strategies are closely related to sustainable development, which balances social well-being, economic prosperity and environmental protection.

Curbing global warming to within 1.5°C would also impact social SDGs such as the reduction of poverty and inequalities: as a matter of fact, should mitigation actions be successful, up to 457 million people could avoid having to migrate because of climate change. However, as highlighted above, even a 1.5°C rise will have severe consequences on the human population, for example in terms of food security and protection of health, above all for some categories such as farming and coastal populations, natives, children



and the elderly, the inhabitants of the poorest cities of the African continent, of the Arctic zones and small islands.

It is therefore necessary to plan on actions aimed to improve the ability to adapt to climate change in synergy with the other SDGs and in particular: guarantee food and water security (SDG2 and SDG6), improve health conditions (SDG3), protect the Earth's ecosystem and decrease the risk of environmental disasters (SDG15), reduce poverty and inequalities (SDG1 and SDG10).

At the same time, one should be mindful that the actions that promote a given SDG may be in conflict with the pursuit of other goals: for example, SDG3 (safety and well-being for all ages) might imply an increase in energy consumption, and the crops for bioenergy, reforestation or forestation (which are, indeed, mitigation actions and refer to SDG13) might usurp the land required for adaptation measures in the farming sector (IPCC 2018).

3.2. STRATEGIES AND INSTRUMENTS TO REDUCE THE ADVERSE IMPACT OF INVESTMENTS

Through **engagement** (discussions) and stewardship (exercise of the voting right), investors can influence the behavior of investee companies in relation to emissions reduction and other climate-related actions. Engagement entails a **long-term commitment** by investors and investee companies alike, as the latter must be willing to re-style their corporate strategies and productive processes.

In recent years, investors have increasingly focused on climate and more in general on environment-related themes. Having regard to 2019 AGMs, 35% of the initiatives taken by the Shareholders for Change European network related to environment and climate; 24 actions out of 76 concerned fossil fuel companies⁴¹. Moreover, CDP currently promotes the “Non-Disclosure Campaign”, an engagement initiative addressing the companies that failed to answer the CDP questionnaire on the impact of corporate activities on climate (see p. 28); over the years, there has been an increase in the number of investors engaged and companies that report this type of information for the first time⁴².

Of course, engagement is not always effective as not all companies are willing

41. The Network is comprised of 11 members with an AUM of €25 billion. In 2019 it undertook engagement activities with 74 companies (Shareholders for Change 2019).

42. For more information: <https://bit.ly/2FQwyeH>

to engage with investors and change their behaviors. Investors can therefore focus on **divestment policies** to reduce the impact of their portfolios on climate. This practice consists in the total or partial sale of the securities of the most polluting companies. In many cases this approach is similar to **exclusions** of specific sectors, companies or States from the investing universe: the selection can concern an entire sector (for example, excluding the companies that operate in the fossil fuels industry) or single names, focusing only on those companies that are not on a decarbonization trajectory, regardless of the industry they belong to.

Several divestment initiatives have been taken globally: the fossil fuel campaign attained in 2019 the target of over one thousand organizations throughout the world that have committed to divest \$11,000 billion from the most polluting companies (Cadan et al. 2019).

However, in case of total divestment, the investor loses the possibility to influence the environmental policies of the company. An effective strategy for reducing the carbon footprint can consist in a **balanced integration of the two approaches**.

An option is that of **reallocation policies**, where investors, including on the back of divestment actions, can replace high-carbon securities with other, less environmentally-impactful ones or appropriate fresh resources to sustainable activities. Having regard to this, in 2012 DivestInvest was established, which aims to promote divestment from companies operating in the fossil fuel industry in favor of activities consistent with energy transition. In September 2020 the movement engaged over 1,200 organizations and 58,000 individuals, thus contributing towards re-orienting capital flows in excess of \$14,000 billion⁴³.

3.3. STRATEGIES AND INSTRUMENTS TO FINANCE ACTIVITIES WITH A BENEFICIAL IMPACT ON CLIMATE

A number of SRI products and instruments are particularly suitable for channeling resources towards activities that help curb climate change and/or mitigate unavoidable adverse consequences.

Set out below is a review of the SRI instruments that can be used for climate action.

43. For more information: <https://www.divestinvest.org/>

Green bond

A significant contribution to beneficial climate activities comes from green bonds, which can support projects in sectors such as renewable energies, sustainable waste and water management, protection of biodiversity or energy efficiency. According to the Climate Bonds Initiative (CBI), (the reference international organization for the market) **\$258,9 billion-worth of green bonds were issued in 2019**. Most proceeds were invested in energy, construction, transport and water (CBI 2020). The introduction of a European standard for green bonds (see p. 60) can encourage market development.

In 2019 **the first climate resilience green bond was issued**, which, as such, meets the requirements of adaptation: the \$700 million issuance by the European Bank for Reconstruction and Development is aligned with the Climate Resilience Principles released by CBI (2019). The plan finances projects for the resilience of corporate, commercial and farming activities and infrastructures, in areas such as energy, transport, communication and urban settings (Bennett 2019).

Even though most issuers are companies (especially non-financial ones), in recent years also **governments have shown a growing interest** in green bonds, with which it is possible to finance public policies aimed for transitioning to economic models with no adverse effects on the environment and climate. **Sovereign green bonds** can finance both direct interventions in “green” projects and indirect interventions aimed to create favorable conditions to support the growth of specified sectors through instruments such as subsidies, tax reliefs and R&D support (CBI 2018).

The issuance of a sovereign green bond is also provided for by the plans of the Italian Ministry

CLIMATE RESILIENCE PRINCIPLES - CRP

These principles provide guidelines on integrating climate change adaptation criteria. Since 2019 they have supplemented the Climate Bonds Standard, which was initially focused on mitigation alone. In particular, the CRPs require that issuers prove, in respect of the activities to be financed by the bond, that they have taken into consideration climate risks; that they have managed such risks through specific measures aimed to reduce them or through management plans that take account of the uncertainties due to climate change; that they systematically assess performances in terms of climate resilience and adapt to risk-reduction measures over time⁴⁴.

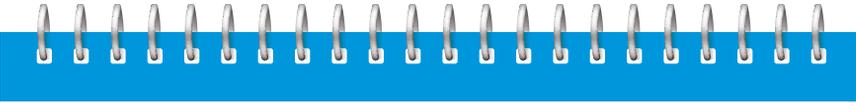
THE GREEN BOND FUND OF THE BANK FOR INTERNATIONAL SETTLEMENTS

In September 2019, the Bank for International Settlements launched a dollar-denominated green bond fund for central banks transactions; at the beginning of July 2020 the fund reached a value of \$1 billion (Milburn 2020).

44. For more information: <https://bit.ly/3mXlfCt>

of Economy and Finance. This project is included in the Green New Deal of the Budget Law of 2020, has been confirmed on several occasions by official sources and technical preliminary work is underway.

In September 2019, the European Commission announced that it is considering the possibility to issue green bonds for raising funds aimed to finance the EU Next Generation Plan (Kahn 2020).



L'EU GREEN BOND STANDARD

The EU Green Bond Standard (GBS) is a **system of criteria, shared across Europe, for the issuance of green bonds**. Thanks to this standard, it will be possible to certify as “EU Green Bond” any type of bond or debt instrument, be it listed or otherwise, issued by a European or international player, that has been shown to be compliant with GBS (TEG 2019a).

The development of an EU GBS is part of the Action Plan of the European Commission. The latter set out to **improve the clarity and transparency of the EU green bonds market** by sharing standardized procedures for the issuance and introduction of common criteria, for example in relation to the projects that can be financed through the use of proceeds or measurements of the impacts generated. The purpose is to **accelerate market development**.

The European Commission entrusted the TEG with drawing up recommendations for the development of the EU GBS. On June 18, 2019, the TEG published a report setting forth the fundamental principles and structure of GBS, a number of recommendations to support the development of the green bond market, forecasts on the impact of GBS among the targets of the Action Plan (TEG 2019a). In March 2020, the TEG published a guide for using GBS, adding the latest evolutions of the taxonomy (TEG 2020c).

The standard proposed by the TEG is **voluntary** and draws inspiration from criteria and good practices that are widespread in the market such as the **Green Bond Principles**⁴⁵.

The GBS is based on four principles:

- 1. alignment with the taxonomy of environmentally-sustainable activities**, for identifying the projects and activities that can be financed;

45. At present, the Green Bond Principles (GBPs) of the International Capital Market Association (ICMA) are the most widespread standard internationally. They cover 4 areas: use of proceeds; project evaluation and selection; revenue management; reporting (GBP and ICMA 2018).

2. publication of a **Green Bond Framework (GBF)**, that is to say a document in which the issuer states: its willingness to align the green bond to GBS; compliance of the financing plan with the environmental goals of the European Union; the use of proceeds; investment processes and reporting;
3. production of **reporting** on the allocation of proceeds and the resulting environmental impact;
4. **verification by an independent auditor** of compliance of the Green Bond Framework and of the allocation of proceeds.

After the publication of the latest report, the Commission started an evaluation of how to put in practice the proposals made by the TEG, including through legislative acts. To this end, it undertook a **public consultation**⁴⁶ between June and October 2020. In addition, one section on green bonds was included in the consultation on the update of the sustainable finance strategy. Among the questions that players were asked, the Commission included the possibility to introduce a **regime of accreditation and supervision for the bodies that will verify whether or not the bonds are compliant with the GBS scheme**. Besides, it surveyed the market on the appropriateness of introducing a **European standard for the social bonds** that finance sectors and projects aimed to counter the effects of the COVID-19 pandemic.

Transition bonds

Transition bonds are an option for investors to support the transition to a low-emission model. **High-carbon companies issue these bonds in order to finance energy-transition-related projects and activities**. In June 2020, Snam issued the first Italian transition bond worth €500 million.

Sustainability linked loans

Sustainability-linked loans **offer favorable conditions linked to achievement by debtors of precise sustainability targets** established at the time of signing the agreement. Performances are measured and monitored using specified reference indicators, so-called sustainability performance target (SPT).

46. For more information: <https://bit.ly/32OWZu7>

Energy efficiency mortgages

These are bank mortgages for the construction, purchase or renovation of residential or commercial real estate that meet at least one of the following conditions:

- **high energy performance**, in line with European Union standards and best practices;
- **energy performance exceeding by at least 30% that of the original real estate asset**, in case of renovation.

The peculiarity of these mortgages is that they provide **easy-terms lending conditions** (for example lower interest rates). In fact, a growing number of academic market research shows that the credit risk of these loans is lower. The lower expenditure for energy consumption and the high commercial value of the real estate, often used as a collateral for the loan, enable to reduce risks for the lender. In Europe, over 40 banking institutions are studying the integration of these instruments in their offering.

The Energy Efficient Mortgages Initiative (the project for introducing green mortgages in the European market) was started by the European Mortgage Federation and the European Covered Bond Council in order to identify a single system for granting the mortgages and encourage energy efficiency of the European construction industry⁴⁷.

Thematic investments and best-in-class selection

Thematic investments are a strategy commonly used by the investors who wish to seize the opportunities that come with transitioning to a more sustainable economic model. A recent ETicaNews survey (Primini 2020) of Italian investment funds reported that climate-related thematic investments posted the best performances in terms of the ESG quality⁴⁸ of the investment as compared to other SRI thematic investments.

The **best-in-class** strategy can be particularly useful for the construction of climate benchmarks (see p. 63), which must maintain diversification unaltered: as a matter of fact, in order to reduce emissions without modifying exposure to the most polluting sectors, investors will have to select the companies that, in the same sectors, turn out to be the best at decarbonization.

47. For more information: <https://energyefficientmortgages.eu>

48. The survey on the ESG quality of funds uses two indicators: the ESG Quality Score, which measures the ability of a product to manage the risks and opportunities arising from environmental, social and governance factors, and the ESG Sustainable Impact Solution Exposure, which indicates to what extent the revenues of investee companies derive from SDGs-focused activities.

2030 Agenda and impact investing

Along the same lines, the **United Nations Sustainable Development Goals** are an increasingly common benchmark used by investors for climate-transition-oriented investments.

In particular, the investors that adopt the **impact investing** strategy can refer to the 2030 Agenda in the analysis that precedes the purchase of securities and in the assessment of the social and environmental aspects of investments. According to the Global Impact Investing Network (GIIN), in 2019 the value of impact investments achieved \$715 billion (GIIN 2020). The energy sector received the largest share of assets managed under this strategy (almost \$20 billion): a trend that is strengthening climate investments.

Climate benchmarks

A benchmark is an index used as a reference parameter to compare the performance of a portfolio or security to market performance. So-called “sustainable benchmarks” are comprised of securities selected on the basis of the issuer’s ESG performance according to different SRI strategies: for example, a benchmark can select the best issuers of a sector or of an asset class by adopting the best-in-class approach (see p. 62).

The Commission – with the technical support of the TEG – has conceived **climate benchmarks** (TEG 2019b) with a view to providing players with **parameters to compare the environmental and social sustainability performance of portfolios**, to be used as part of strategies to reduce GHG emissions.

EU Regulation 2019/2089⁴⁹, adopted at the end of November 2019, introduced two types of climate benchmarks:

- **Climate Transition Benchmarks**, that select securities based on the issuers’ GHG reduction targets so that portfolios are on a decarbonization trajectory;
- **Paris-aligned Benchmarks**, that enable the construction of portfolios compatible with a temperature rise to within 1.5°C.

Climate benchmarks require portfolios to post **each year a 7% year-on-year reduction in GHG emissions**. This parameter has been calculated taking account of the current level of emissions and the 2050 carbon neutrality target. To do this, it is necessary to modulate the weightings between high-impact and low-impact companies in the same sector. As such, adherence to a climate benchmark pushes the investor to gradually increase the proportion of capital invested in companies that help achieve climate targets, which as a result are added to in the

49. For more information: <https://bit.ly/3kfhs0H>

Furthermore, the Regulation requires index providers - the companies that develop the indices - to disseminate information on how they integrate sustainability issues into the construction methodologies of all benchmarks, even those not explicitly ESG.

portfolio. The portfolio must **maintain the level of diversification unaltered**: in other words, in order to reduce the level of emissions it is not possible to undercut a high-impact sector and favor low-impact sectors.

Other benchmarks constraints are as follows:

- use the IPCC average global temperature rise to within 1.5°C as reference scenario;
- exclude from the investible universe those companies that operate in the arms and tobacco sectors, those that violate the Global Compact principles and the OECD Guide Lines on Multinational Enterprises and those that exceed specified turnover thresholds in sectors connected to fossil fuels.

Climate Transition Benchmarks must have a level of GHG emissions lower than 30% compared to the investible universe. For Paris-Aligned Benchmarks this parameter is more demanding and set to 50%.

3.4. WHAT TO INVEST IN: THE TAXONOMY AS A GUIDE FOR IDENTIFYING PRIORITY SECTORS

As regards the sectors to concentrate investments in, through the strategies and instruments mentioned in the preceding paragraphs, financial players can refer to the European taxonomy of environmentally-sustainable activities. As already highlighted (see §2.2.), the classification of environmentally sustainable activities is an instrument that has been specifically conceived to help companies, investors and public players **identify those activities that contribute towards achieving the European Union environmental and climate targets**.

In particular, in outlining the taxonomy in relation to mitigation and adaptation, the TEG has identified **sectors that have a large emissions footprint, and sectors that can help reduce emissions in other sectors**.

Within each sector, **technical criteria** (in the case of mitigation) and **qualitative requirements** (in the case of adaptation) have been identified for defining the **contribution to the EU environmental and climate targets** without harming significantly any of them. The detailed technical mitigation and adaptation criteria of the latest TEG report enable to identify sustainable activities in sectors accounting for approximately 93% of European Scope1 emissions: this way, the taxonomy enables to support the transition in the very economic areas that are associated with the highest impacts on the environment and climate.

The Regulation also recognizes **enabling activities** that directly contribute towards achieving environmental targets, such as is the case of the production of facilities and components for the generation of energy from renewable sources.

As regards mitigation, the taxonomy Regulation and the TEG consider as

compatible both the **activities that directly help reduce emissions** (for example, the generation of energy from renewable sources) and **transition** ones, whose **level of emissions is lower than that of the reference sector**.

FIGURE 7. Sectors that contribute towards mitigating climate change



Source: Italian Sustainable Investment Forum from TEG

Starting from the taxonomy, **chapters 4 and 5 analyze a number of areas that are a priority in terms of achieving mitigation and adaptation targets:** energy (Chapter 4), farming and forests (§5.1.), transport and mobility (§5.2.), cities and construction (§5.3.), digital technologies (§5.4.), circular economy (§5.5.). Transitioning to a circular economy is one of the six European environmental goals (see p. 37) which, as said later, significantly contributes towards countering global warming.

THE ROLE OF BANKS IN TRANSITIONING TO A LOW-CARBON ECONOMY

Giovanna Zacchi, External Relations and RSI Activities, BPER Banca

The European Commission guidelines on non-financial reporting, the Action Plan for sustainable finance, the implementation Regulations already approved or being drawn up, ESG ratings and finally the ECB, EBA and ESMA, require that credit institutions focus on **emerging risks** and on **indirect environmental impacts (loans and investments)** with a strong emphasis being placed on promoting **transparency** and a **long-term vision in economic and financial activities**. As such, a paradigm change is underway in the transition to a low-carbon economy and the financial industry is a key player in this respect. Specifically, banks are required to gain new skills and transform their activities and behaviors with a forward-looking attitude especially in terms of green innovation. In fact, one should not forget that **banks are the main players of the financial market that can have a positive impact also on SMEs**, thus extending the scope of the Plan for sustainable finance to include the real economy.

This transformative process is well underway. Aside from the regulatory evolution that is increasing the stringency of disclosure requirements and environmental risk management, significant organizational changes are taking place within banks. For example, sustainability duties have been shifted to core functions as the requirements in terms of sustainable finance information and skills increase every day.

Which are **the opportunities** for the banks that wish to accelerate the transition to a low-carbon economy?

1. **By financing low-carbon economic segments**, which is per se an opportunity as a number of studies have foreseen that the growth of the low-emission economy will outpace the overall GDP (University of Cambridge Institute for Sustainability Leadership 2020).
2. **By growing the low-emission supply chain and deriving commercial benefits from it**: besides financing the current market trends, a bank can choose to support its acceleration and derive further benefits in terms of strategic positioning.

Which are **the risks of inaction**?

1. possible presence in the portfolio of **unmeasured and unmanaged risks** (for example, climate-related physical risks);
2. **pressure from investors, employees and the civil society**;
3. **legal liability** (for example, damages claimed for losses suffered as a result of a climate-risk-related event, where the latter had not been taken in due account, as required under Regulation 2019/2088).



Therefore, the priority for banks is to understand the impact of climate-related risks on the business context in which they operate, in the short- and long-term alike, so as to make adequate strategic decisions and evaluate market opportunities.

Over the last few years, BPER Banca has taken a course of action that has led it to define its 2019-2021 Business Plan and approve the 2020-2021 Sustainability Plan that supplements the Business Plan and sets out the strategic guidelines for developing corporate processes in terms of sustainability.

Business models, governance and strategies are all impacted by this transformation. The integration of ESG factors in the core business results in greater attractiveness for investors, better risk management, enhanced customer loyalty and reputational benefits. However, the story of green finance activities of BPER Banca started in 2016 when it was selected as pilot bank for a project finance instrument (the Private Finance For Energy Efficiency instrument (PF4EE)), supported by the European Union as part of the LIFE Program and defined as part of a common agreement between the European Investment Bank and the European Commission. The agreement provided for the construction of loan portfolio of up to €50mn for the energy efficiency of SMEs and large corporations.

Since then, several green corporate and retail products have been marketed: green mortgages and personal loans, easy-terms loans for energy efficiency and innovation, green loans and loans with environmental purposes, project financing and, more recently, a stimulus in the form of the so-called “110% eco-bonus”.

Another continuously increasing sector is the placement of sustainable funds. BPER has long operated in this sector and in fact it holds stakes in the capital of Banca Etica and Etica Sgr, of which BPER tops the ranking of placement banks by volume of funds sold. Besides, Arca SGR, a company of the BPER group, joined the PRI and has offered ESG products since 2020.

As such, the course is set, with a strong push also from the European Commission, and it would not be entirely ethical, and assuredly not far-sighted in terms of business, not to take up the challenge of transitioning to a low-carbon economy.

INTEGRATING CLIMATE CHANGE IN PASSIVE INVESTMENTS. THE CASE STUDY OF AN EQUITY STRATEGY IN DEVELOPED MARKETS

Valeria Piani, Strategic Engagement Lead, Sustainable and Impact Investing team, UBS AM

A new evolution for passive strategies

In order to integrate climate-change-related risks in the financial analyses of passive investments, UBS has designed an **equity solution based on rules for capitalizing on the long-term transition to a low-emission economy**. The strategy needed the **flexibility to increase or decrease exposures to the components of the index** based on the company performance in tackling climate-change risks and opportunities whilst offering **returns in line with traditional developed market indices** (FTSE Developed and MSCI World).

Hence, it has created a **multi-dimensional set of parameters** that aim to maintain returns aligned with the main benchmark while achieving sustainability goals by: reducing exposure to growth and GHG-emissions intensity, decreasing exposure to the use of energy from non-renewable sources (coal and other fossil fuels) and increasing exposure to renewables and companies with strategies aligned to low-carbon-emission projects.

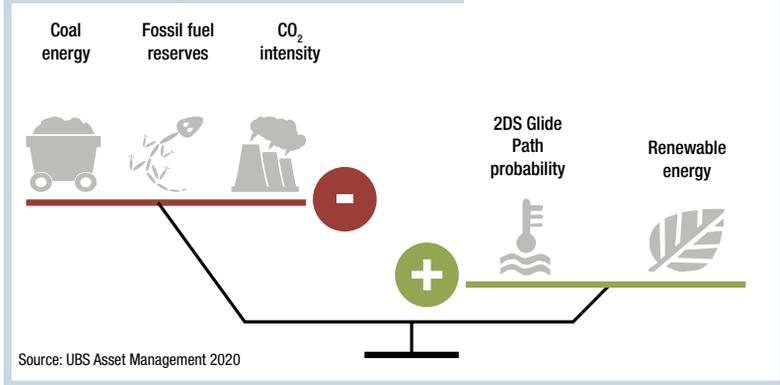
The model of ESG incorporation

The solution combines **quantitative and qualitative information, in a systematic approach**. As part of the available risk budget⁵⁰, the strategy redistributes approximately 15% of the total investment through a number of factors (three risk-reduction factors and two opportunity-scouting factors): **a negative tilting is used to reduce the risk of a company** with high GHG emissions, high use of energy from coal and the presence of large of fossil fuels reserves; **a positive tilting is used to increase exposure** to the companies that provide renewable energy and support the related technology and those that are highly likely to help achieve the goal of curbing average global warming to below 2°C. Seven datasets⁵¹ are used to assess each company on five factors.

50. The strategy has a tracking error budget from the reference index of 0.5 b.p.

51. The 1-3 datasets include: CO₂ emissions of Scope 1 deriving from the consumption of fossil fuels by the company in its production processes; Scope 2 of CO₂ emissions that represent the level of indirect emissions deriving from the consumption of purchased energy; area 3 emissions that represent the indirect emissions associated to the sale and purchase activities of the company that would not be reckoned otherwise. Dataset 4 comprises both the absolute level of energy generated from coal and the production of coal extracting companies. Dataset 5 includes fossil fuel reserves and dataset 6 includes investments in renewable energies and related technologies. It is important to highlight that the optimization process incorporates a score of Glide Path Probability (dataset 7) to take account of the trajectory of CO₂ reduction and hence the probability that each company is reducing emissions in line with a scenario of carbon emissions reduction.

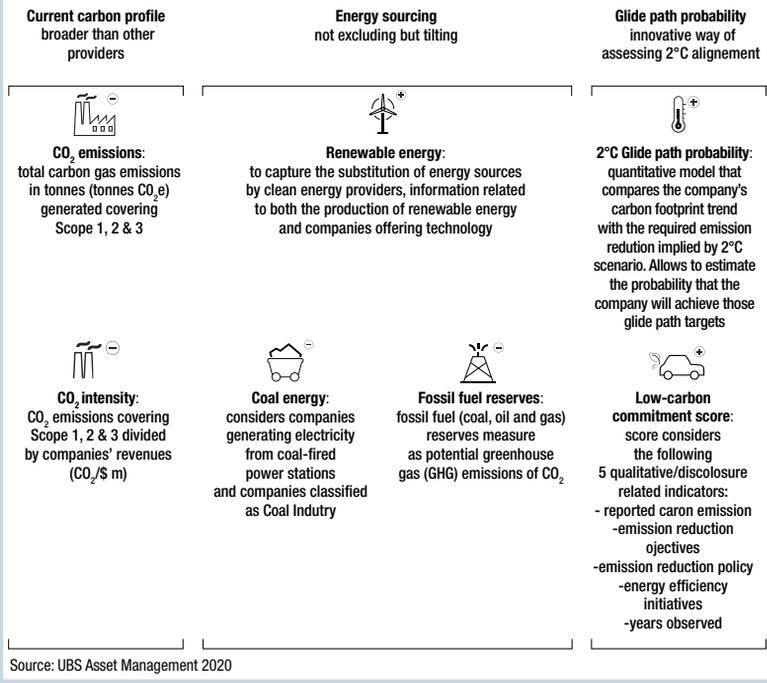
FIGURE 8. Factors applied to the Climate Aware Fund



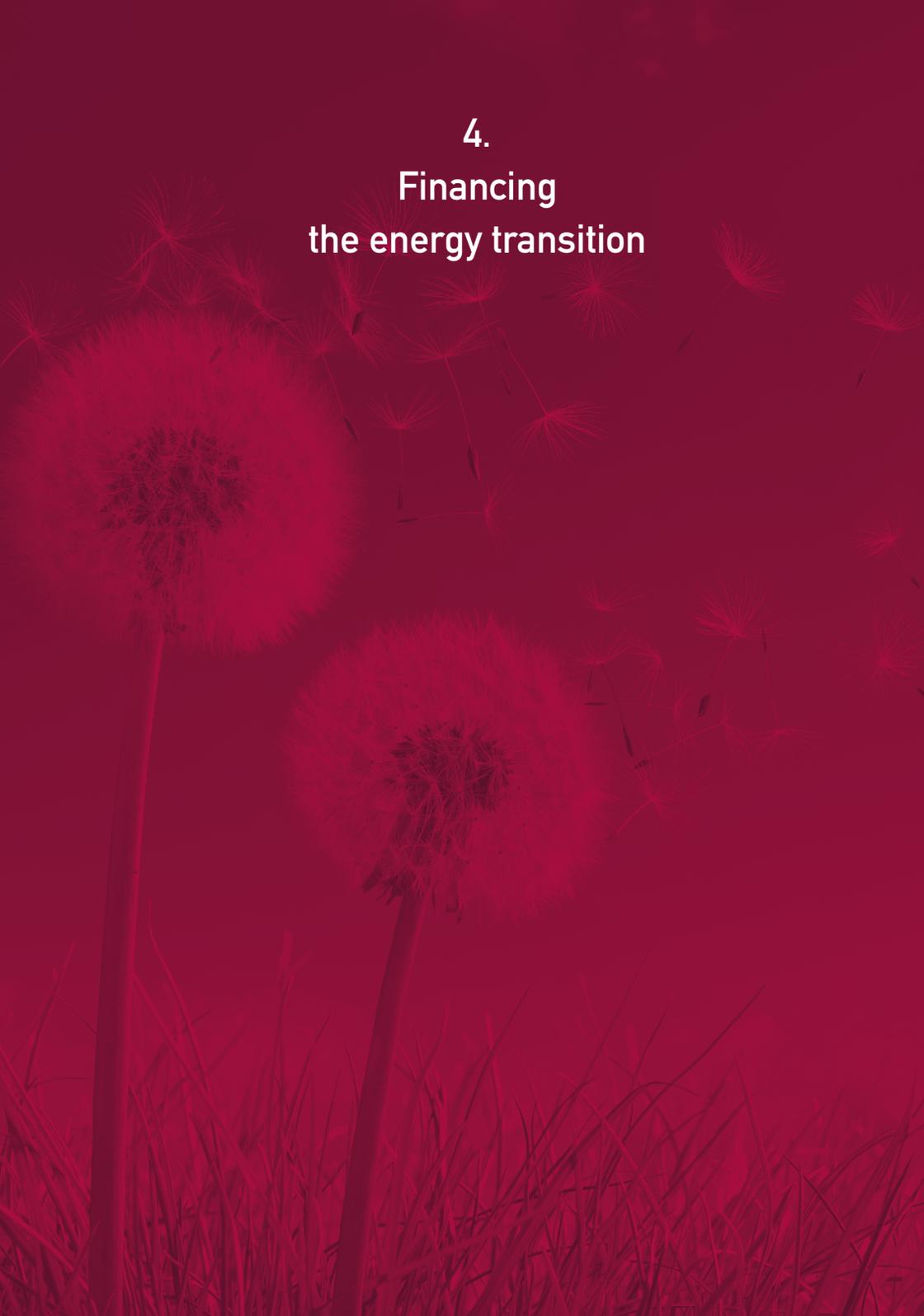
The quantitative model compares each company's **carbon emissions to the required emissions reduction** according to the temperature rise to below 2°C scenario defined by the International Energy Agency (IEA). In order to mitigate carbon-emissions-data quality issues, the quantitative model estimates are supported by qualitative data that measures the **transparency** of companies on environmental data as well as their **implementation of policies, goals and/or initiatives** relating to emissions management and reduction.

49. Il set di dati 1-3 includono: emissioni di CO₂ dell'area 1 derivanti dal consumo di combustibili fossili da parte dell'azienda nei propri processi di produzione; area 2 delle emissioni di CO₂ che rappresentano il livello di emissioni indirette derivanti dal consumo di energia acquistata; emissioni dell'area 3 che rappresentano le emissioni indirette associate alle attività di acquisto e vendita dell'azienda non altrimenti rilevate. Il set di dati 4 comprende sia il livello assoluto di energia generata dal carbone generato sia la produzione di società estrattive di carbone. Il set di dati 5 include le riserve di combustibili fossili, mentre il set di dati 6 include investimenti in energie rinnovabili e tecnologie associate. È importante sottolineare che il processo di ottimizzazione incorpora un punteggio di Glide Path Probability (set di dati 7) per tenere conto della traiettoria delle riduzioni di CO₂ e quindi della probabilità che ciascuna azienda stia riducendo le emissioni in linea con uno scenario di riduzione delle emissioni di carbonio.

FIGURE 9. Quantitative and qualitative factors used in portfolio construction



The last step consists in **incorporating the final scores** deriving from influential factors in a portfolio optimizer subject to existing investment constraints (for example, sector, country, factor), trying to maximize the low-carbon emission potential in an efficient model portfolio. Besides, the passive strategy is supplemented by a **program of targeted engagement with companies**, that covers (individual and collective) engagement and stewardship. Engagement with companies enables to share with investee companies the results of quantitative and qualitative assessments in the fund methodology, verify company performances compared to other data sources and think of improvements to be added to the subsequent versions of the model. Interacting directly with companies means being able to expressly communicate the changes that one wants to see in corporate practices and collect feedbacks from the management. At the end of the first three years of engagement, we will evaluate how to translate the success or failure of engagement in a further variable so as to define the overweights and underweights of the strategy.



4.
Financing
the energy transition

Chapter 4 deep-dives in the “energy” compartment, which, being one of the priorities for achieving mitigation goals, is included in the European taxonomy of environmentally-sustainable activities. Given the importance of this sector in view of countering climate change (§4.1.), this chapter discusses: the decarbonization targets of the European (§4.2.) and Italian (§4.3.) energy markets, including with reference to Public Purchase Agreements (PPAs); the theme of hydro-electrical and electro-chemical storage (§4.4.) and the role of hydrogen in the decarbonization process (§4.5.).

Virginia Canazza, CEO, REF-E

Matteo Leonardi, Senior Advisor, REF-E

Clio Scandola, Consultant, REF-E

4.1. THE STATE OF THE ART OF THE “ENERGY” SECTOR

The European Commission climate and energy policies are closely interconnected and the rules that should follow the path of decarbonization have increased alongside those for the creation of single electricity and gas markets.

Only as late as in 2018, however, was the electricity and climate legislation aggregated in a single initiative, the *Clean Energy Package* (see box “The European Directive on Renewable Energies”, p. 75). The underlying idea is that, after the season of overt incentives for the growth of renewable sources, it is the very design of the electricity market, through the integration of renewable sources in competitive mechanisms, that provides a just remuneration to support the growth of renewable energies. As a whole, these initiatives aim to solve, through market mechanisms, what has been termed the “trilemma” of the European energy policy, that is to say the attempt to combine environmental sustainability, the free market and economic growth.

Why the energy sector is important from the point of view of climate change

The key instrument of European policy to achieve decarbonization targets is the **Emission Trading Scheme (ETS)**: permissions to issue CO₂ are freely exchanged in the market and released in decreasing order over time in proportion to emission reduction targets. This way, their price reflects the gap between actual emissions and targets (the wider the gap, the fewer the permissions granted and the higher the price). The purchase of quotas is a cost for companies and increases in proportion to how carbon-intensive the product is considered to be.

For example, in the electricity sector, the ETS at present accounts for approximately 20% of the gas-based generation price and approximately 30% for coal. Globally, almost 50% of CO₂ emissions are generated by the electricity sector and heat production. The thermoelectric sector is therefore one of the most important ones in the ETS mechanism.

In 2018 the EU ETS system underwent a major regulatory reform: **European Directive 2018/410** established a number of structural changes for the 2021-2030 period (phase 4 of the EU ETS system) aimed to improve the effectiveness of the mechanism and guarantee incentives for investments in low-carbon and carbon-free technologies in all sectors.

The main interventions include:

- **a more stringent annual CO₂ emissions cap and fewer allowances available than under the initial project**: in order to ensure a 43% reduction of CO₂ emissions in 2030 compared to 2005 volumes, the annual quotas available in the market will decline by 2.2% rather than by 1.74% as initially foreseen;
- **the Market Stability Reserve (MSR)**, introduced in view of absorbing excess supply of permissions and balance the market⁵²; the MSR came on stream in 2019 with positive outcomes as the reduction of quotas was followed by an increase in the market price of CO₂;
- **free-of-charge allocation for carbon-leakage sectors**: industrial sectors at risk of delocalization because of the high cost of CO₂ emissions, as compared to international competitors, could benefit from free-of-charge allocation quotas, based on specific sector benchmarks relating to the best technologies available.

Besides the ETS mechanism, the European climate policy includes: **renewable energy sources penetration targets** (with specific forms of incentives for RES in the electricity and transport sectors and for residential use from 2012) and **energy efficiency targets**.

4.2. THE DECARBONIZATION OF THE EUROPEAN ELECTRICITY MARKET

Renewable energy sources are key for achieving decarbonization targets. Within the EU, Member States are subject to renewable energy targets but each national government can decide, subject to EU State aid guidelines, which support policies to implement.

By 2030, against a 40% CO₂ reduction target (compared to 20% by 2020), **the European target for the penetration of renewable energies under the Clean Energy Package has been set at 32%**: this threshold is a trade-off between the 27% target that many countries wanted and the 35% threshold identified by the European Parliament as being the level that would enable to stay on the trajectory of complete decarbonization by 2050. The common energy-saving target has been

52. When supply exceeds demand by over 833 MtCO₂, the MSR should withdraw a specified proportion of available permits, ranging between 24% for the 2019-2023 period to 12% from 2024 onwards. When available volumes fall short of 400 MtCO₂, the MSR might inject up to 100 MtCO₂ per year.

raised from 20% by 2020 to 32.5% by 2030⁵³. The National Energy and Climate Plans (NECPs) drawn up by Member Countries point out national efforts in terms of renewable sources and energy efficiency. Discussions with the Commission enable to align the European target to the commitments of individual countries. The NECP for Italy sets a penetration target for renewable energy sources (RES) of 30% of final energy consumption, corresponding to 55% in the electricity sector.

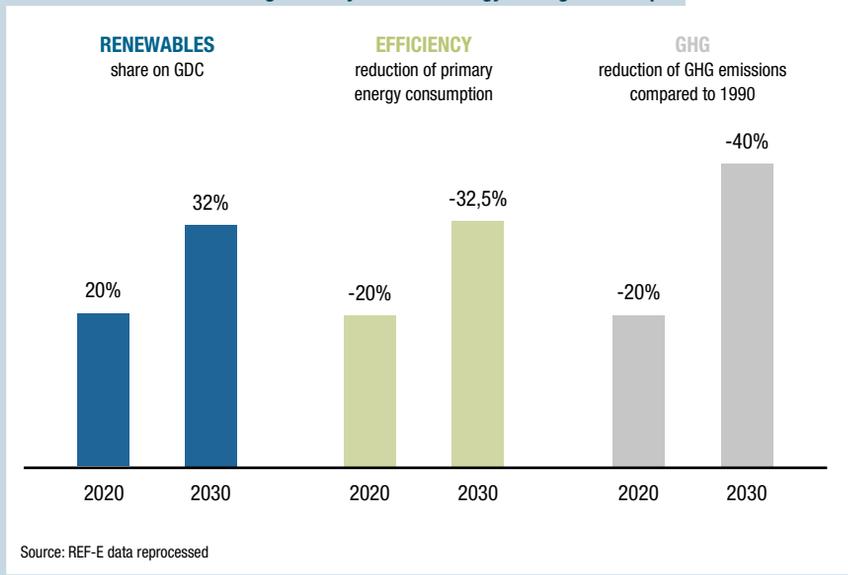
The Green Deal of December 2019 provides for the raising of the decarbonization target by 2030 to 55%. In September 2020, the impact assessment identified possible quantitative targets for the development of renewable sources and energy efficiency to support the new target. In the coming months, the European Commission will make proposals for the targets to be set for specific sectors, which will then have to be transposed in national plans.

As regards possible support mechanisms, a lot had already been decided with the guidelines on state aids, which set the path towards a **phase-out of contributions**. In order to stimulate the sector, the spotlight has been turned on **risk reduction to incentivize investments**: the principles of a single authorization and stability of incentives regulations are now established, and are not expected to be subsequently re-examined. In the new Directive there is also room for self-production of electricity from renewable sources, to be included in the calculation of the overall quota of renewable energies and to be permitted also for condominiums and energy communities⁵⁴. In the course of 2021, Europe foresees a review of energy taxation and of the rules on State aids, which would significantly modify the regulatory framework that underlies the development of RES.

53. The target continues to be set, rather than from a starting point, based on a new scenario of consumption trend developed in 2007, that is to say before the international economic crisis profoundly redefined both the actual consumption trajectories and growth ones.

54. By renewable "energy communities" it is meant associations of citizens, commercial activities or businesses with shared installations connected to the low-voltage electricity network for the production energy from renewable sources through the same mid/low-voltage transformer cabinets from which the energy community also withdraws electricity from the grid, with the possibility to share the energy produced for immediate consumption or store it future use.

FIGURE 10. Decarbonization targets set by the Clean Energy Package for Europe



THE EUROPEAN DIRECTIVE ON RENEWABLES ENERGIES

EU Directive 2018/2001 on renewable energies entered into force in December 2018, as part of the **Clean energy for all Europeans Package** aimed to maintain the EU world leadership in renewable energies and, more broadly, deliver on the emissions reduction commitments undertaken with the Paris Agreement.

This EU Directive sets a new binding target for renewables of **at least 32% of the gross final consumption by 2030**, with a possible upward revision by 2023, and includes measures for the different sectors to achieve the target. This implies new provisions to allow for self-production of renewable energy, a target of 14% for the proportion of renewable fuels used in transport (by 2030) and stronger criteria to guarantee the sustainability of bio-energies. These goals will have to be adjusted to the new decarbonization target set by the Commission. Furthermore, in September 2020, Europe proposed a mechanism to finance RES to which member States and private entities can participate.

Under the Energy Union and Climate Action (EU) 2018/1999 Governance Regulation, EU



countries are required to draw up **National Plans for Energy and Climate** for 2021-2030 illustrating how they are going to achieve by 2030 the new targets for renewable energies and energy efficiency.

Updating the targets to the extent required by Europe will lead to **updating the emissions quota exchange system** and its possible extension to other sectors, with an obligation to reduce emissions in those sectors that are not covered by ETS, a review of energy taxation and land use regulations.

4.3. THE DECARBONIZATION OF THE ITALIAN ELECTRICITY MARKET

Having regard to Italy, the Reference⁵⁵ REF-E scenario shows the **possibility to meet the entire demand with renewables and gas-based generation**, reducing net imports from abroad, as provided for under NECP.

Failing a forced phase-out by 2025 of coal-based generation and express incentivization of renewable sources, the transformation of the mix should be based on market signals: the ETS appears to be able to ensure the **substitution of coal with gas-based production by 2030** and, in the very long term, enable a further development of renewable technologies, including in combination with storage solutions, so as to progressively substitute gas-based generation on a trajectory of full decarbonization by 2050.

The dynamics of “spot price” per hour and by zone, instead, will be strongly influenced by the penetration of renewable sources, by the development of the transmission network and of short-term (per hour, per week) and seasonal storage technologies. Photovoltaics (PV) structurally tends to alter the form of the residual demand met by thermoelectric power, potentially resulting in a generation surplus from solar sources compared to demand during peak solar radiation and driving prices down accordingly. This “cannibalization” effect can be milder for wind power generation which, except for monthly seasonality, tends to have a baseload⁵⁶ profile though with high hourly variability. The level of storage

55. REF-E (a company operating in the energy market with research, customized consulting, independent observatories and training activities) identifies three alternatives for the future scenario of the Italian electricity market: 1) the Reference scenario, with a greater probability of occurrence, that aims to achieve the targets of the national energy policy taking into account the technical and economic sustainability that is required to achieve the target mix in the long term; 2) the Green Revolution scenario, which is more ambitious than the Reference scenario, is more focused on technological progress and is essentially in line with NICEP by 2030; and finally 3), the more defeatist Thermal Renaissance scenario, which has a very low probability of occurrence and which hypothesizes a failure of environmental policies.

56. Homogeneous production profile during the day, not characterized by identifiable production peaks at specified hours.

penetration indicates market competitiveness in mid-daytime hours and the possibility for thermoelectric sources to recover margins in the evening.

Prospectively, the electricity system must be able to efficiently, safely and adequately **manage a high-intensity energy mix of non-programmable energy sources**. The penetration of non-programmable renewables increases the reserve and balancing⁵⁷ requirement and, as a result, this will push up the volumes required in the Ancillary Service Market (Mercato per il Servizio di Dispacciamento (MSD)) to safely manage the system. These dynamics, that will be reflected in the market prices of services, represent, amongst others (and subject to regulation adjustment) the market tool for the remuneration of storage.

RES capacity is present throughout Italy. Solar capacity is the one that **features the most uniform distribution**. This might appear to be counterintuitive, as the highest radiation is in Southern Italy, such as to allow for an annual producibility of as much as 20-30% compared to plants located in Northern Italy, but PV is a versatile and modular technology, with a broad range of sizes that can be installed. Besides, it is rather convenient for self-consumption – which makes it interesting for the industrial and residential sector. The country's industries, income and population are concentrated in central and northern Italy, which explains why commercial/residential plants are widespread in these areas, despite the lower producibility.

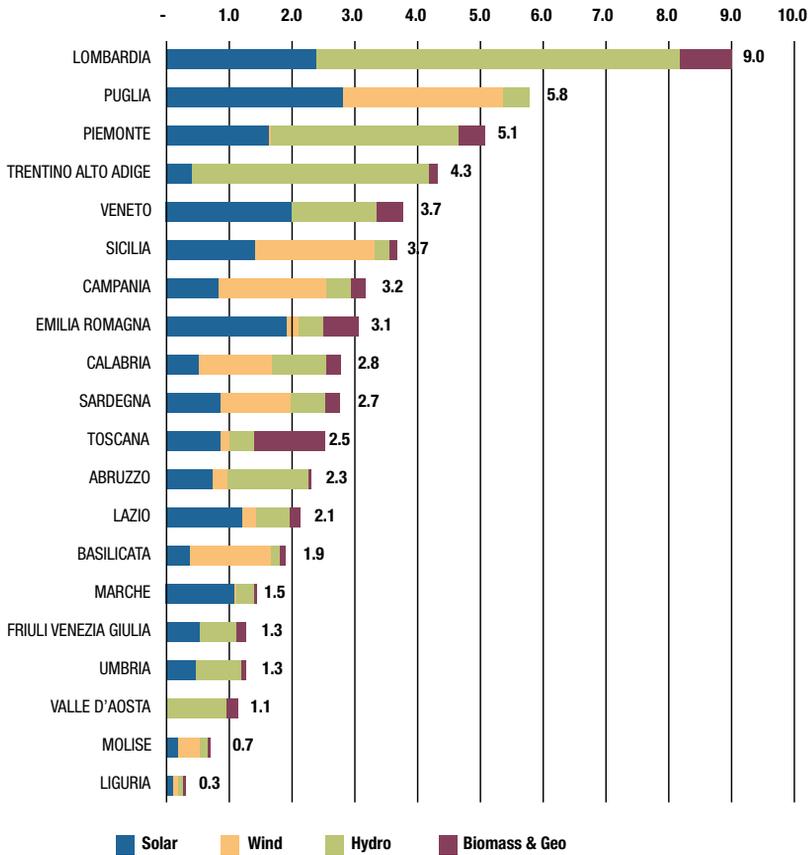
Biomass capacity shows a similar trend and **typically spreads in industrial poles** – hence its greater presence in Northern Italy. The entire Italian geothermal capacity is in Tuscany.

Wind power and hydroelectric power are much more constrained by geographic conditions. Most hydroelectric capacity is in northern mountain areas. Wind capacity, instead, is widespread across Southern Italy and the islands, where wind conditions are more favorable. The natural hydroelectric potential has already been fully tapped and there is no significant room remaining for further improvement, except for hydroelectric power storage that has good growth perspectives ahead in Southern Italy to guarantee regulation and reserve capacity combined with the renewables. Instead, one might expect a progressive proliferation of wind power projects including in territories that do not present the best weather conditions on paper, because technological costs continue to decrease, against a progressively higher wind-capturing capacity.

As illustrated in the chart below, Lombardy is the Italian region with the highest RES capacity, followed by Puglia and Piedmont. Except for Puglia, most RES capacity is in Northern Italy.

57. Service performed by Terna (Transmission System Operator (TSO) in Italy) for maintaining in real time the balance between inputs and withdrawals in the national electricity system. To this end, Terna purchases the related services on the Dispatching Services Market.

FIGURE 11. Italian RES installed capacity by region (2019)



Source: Terna data processed by REF-E

Solar and wind power are the most mature technologies: their growth would ensure achievement of the targets by 2030 without using outright incentives and at market parity (i.e., with the captured market⁵⁸ exceeding the levelized cost of electricity (LCOE) of renewables)⁵⁹.

It is worth pointing out that the **reduction in the cost of capital of the main renewable energy sources has been very significant over the last decade.** From 2010 to 2019 the average cost of PV and onshore wind power technologies in Italy declined by over 80% and about 40% respectively, in line with global trends. In the coming years, the costs of renewable energy generation are expected to decline further in view of a stronger market parity so that Electric Renewable Energy Sources (E-RES) plants can compete with other sources.

However, the cost evolution outlook suggests that robust market parity will be achieved faster in the case of solar PV plants whose Capex⁶⁰ should decline, thanks to technological advances and economies of scale, by approximately 25% from today to 2030 and by over 40% from today to 2040⁶¹.

Finally, it is worth noting that **the NECP's target of 187 TWh for the development of renewable energy sources by 2030** (base-case scenario not including the updates introduced by the Green Deal and equal to a quota of 55% of the national gross consumption of electricity) implies **investments in excess of €30 billion** considering the new generation capacity alone and hence not including the renovation of existing plants and the development of network and storage infrastructures. The mobilization of these resources requires a **strong involvement of the financial sector**, that has traditionally invested in renewable energy sources backed by public guarantees through highly favorable incentive systems.

As the **achievement of the decarbonization target is helped by the electrification of consumption**, the electricity generated from renewable sources should substitute the use of fossil fuels as an energy source for transport, civil and industrial heating and cooling installations. However, the current pace of technology replacement is very slow. Updated decarbonization targets will require a faster integration among energy systems, as stated in the recent European strategy⁶², to allow the electricity sector to help reduce emissions from transport and heat consumption.

58. The captured market price is the revenue from renewables during generation hours, as weighted by their generation.

59. The LCOE is a measure of the net average present cost of electricity generation including investment costs, O&M costs and the debt structure. The LCOE of both PV and onshore wind energy assumes 100% equity financing by developers, an average discount factor of 7% and project lifetime of 20 years.

60. As explained above (see p. 38), "Capex" is the capital expenditure specifying a company's cash flow for the purchase, maintenance or implementation of its operating fixed assets (i.e., wind power and PV plants in the case at issue).

61. Cost evolution estimates based on updated research provided by Energinet and by the Danish Energy Agency.

62. For more information: <https://bit.ly/36gOrOT>

Energy efficiency is equally significant in view of decarbonization. At present, several energy efficiency measures are in place. While an energy efficiency certification mechanism is available for the industrial sector, tax deductions for the civil sector have proven to be particularly effective as they entail mandatory requirements for new buildings and labeling for household appliances. The NECP foresees that future **energy efficiency policies will focus on heating and cooling**.

The European Commission has set, for each Member State, an energy saving target, to be achieved between January 1, 2021 and December 31, 2030, of at least 0.8% per year of the actual average energy consumption in the 2016-2018 period. In 2030 the annual target for Italy is set at 9.2 Mtep, with a cumulated energy saving of 50,9 Mtep between 2021 and 2030 (with the Italian NECP aiming for a cumulated energy saving of 51.4 Mtep for the decade). This target, as well, will have to be updated in line with the new commitments undertaken at a European level.



PUBLIC PURCHASE AGREEMENT - PPA

The Public Purchase Agreement (PPA) is a **long-term contract that governs the supply of electricity between a party that generates power and a party that purchases it** (off-taker). Under a PPA, the party that generates power can guarantee the long-term withdrawal of the energy supplied by its plant against the commitment undertaken by the off-taker. This type of contracts implies the transfer of various types of risk (see below) from the party that generates power to the off-taker, with the latter being willing to take on such risks in view of the supply of electricity at a favorable cost.

The stipulation of a PPA requires the definition, allocation and management of the **most typical risks of long-term projects**:

- **market risk**, i.e. the possibility that market prices, in a given area or because of balancing charges, fall short of the value defined in the contract;
- **counterparty risk**, i.e. the possibility that a counterparty is unable to collect, pay or supply the amount of energy agreed-upon;
- **volume risk**, i.e. in the event of difficulties in complying with the profile and trading volumes agreed upon;

60. For more information: <https://bit.ly/36gOrOT>

- **regulatory risk**, i.e. unforeseeable regulatory changes that can influence the value and volume of energy in the long term.

PPAs are increasingly popular in Italy, though less so than in other geographies such as the United Kingdom, Spain, Scandinavia and the United States. The mechanisms currently in place in Italy (e.g., tax breaks and net metering⁶³) continue to support the mainstreaming of renewable energies. In addition, since the end of 2019 auctions are being used for new incentive-based RES plants. However, some sources such as wind energy and PV are becoming competitive in the market: indeed, new projects are being implemented that have been started without any incentive and several PPAs have been signed⁶⁴.

Current Italian PPAs account for a total capacity of approximately 600 MW, equal to approximately 1.3% of the new capacity required to achieve the 2030 energy policy targets. The risk-opportunity analysis conducted in Italy has revealed a number of **criticalities** relating to the exposure to market and regulatory risks of long-term contracts and the propensity of demand. As regards the latter, aggregations and consortia are an excellent option to overcome the fragmentation of Italian demand (mainly coming from SMEs) and to manage counterparty risk. In addition, as regards the demand from corporates, one should consider that:

- for some energy-intensive customers, the risk of being tied to supplies at a price higher than that of competitors outweighs the opportunity to have access to energy at a lower price compared to the potential market;
- for other corporate customers, electricity supply options are not strategic and hence they are still little motivated by environmental sustainability strategies.

In general, **in Italy the role of PPAs in achieving NECP's targets has not yet been defined precisely**, and the same holds true for the possible role of public entities in developing PPAs. While the FER1 Decree confirmed that an auction system will support the development of renewables until 2021, it does not clarify to what extent the legislator intends to use incentives thereafter and to what extent the growth of RES will be delegated to market dynamics.

63. Net metering enables residential and commercial customers that generate their own electricity from renewable sources to sell back to the grid any surplus energy that they do not use, thus offsetting the energy from captive production fed into the grid. This energy is measured through a service known as on-Site Exchange.

64. PPAs are bilateral contracts whereby a purchaser accepts to purchase energy from a RES producer for 5-20 years on average.



THE DIFFERENT TYPES OF PPA

Lorenzo Parola, Partner, Italian Head of Energy Sector, Herbert Smith Freehills Studio Legale
Francesca Morra, Partner, Herbert Smith Freehills Studio Legale

Several PPA schemes have been tested in Europe over the last years. The most common scheme (**utility PPA**) envisages as parties of the agreement **a producer from renewables and a wholesale buyer** (trader or utility) **which buys all the electricity generated by the plant and resells it on the wholesale market**. This scheme is particularly widespread in Spain and it has been used for the first non-intragroup renewable long-term PPA in Italy (between Canadian Solar – currently, Sonnedix – and Trailstone) since it is a valid tool for the financing of renewable projects which are often developed by infrastructure funds.

A more complex scheme envisages a triangulation among the producer, the wholesaler and a corporate end customer. In this case, the wholesaler does not sell the withdrawn electricity on the market but ensures its resale through an agreement with one or possibly more end customers, which have an interest in withdrawing the energy generated by a specific plant. For example, in Italy, this is the scheme used by the steelmakers which contributed to the additionality of green energy through PPAs (e.g. PPAs executed between Fera, producer, DXT, trader, and Duferdofin Nucor, end customer). In principle, **it is also possible to execute a pure PPA with an end customer or with demand aggregation consortia (corporate PPA)**. In Northern European, these PPAs are particularly common, even with a term of up to thirty years; however, apart from possible regulatory complexities, this scheme requires the end customer to have energy management skills and, above all, to guarantee a high credit rating (e.g., Amazon, AkzoNobel, DSM, Google, Philips etc.), since there is not the brokerage of a wholesaler to rely on.

PPA scheme is different in the context of self-consumption systems (individual or collective), efficient user systems (SEU) and energy communities in which renewables plants are designed and financed based on the needs of the end customer on site, which sometimes is the promoter of the project itself (so-called “on-site” or “private wire” PPA). **In addition to “physical” PPAs**, i.e. those that envisage the supply of electricity generated by renewables, **also financial contracts** (contracts for differences - CfD) **are widely used**. In particular, these contracts protect the producer from price risks (in the event of either hedging contracts or combination of physical supply at a variable price and hedging contract) or ensure the producer a constant cash flow regardless of the meteorological risk (proxy revenues swap) leaving it solely exposed to the operational risk connected with the non-operation of the plant (the so-called “availability risk” which is, however, transferred from the producer to the contractors responsible for the construction and the maintenance of the plant).

4.4. HYDROELECTRIC AND ELECTROCHEMICAL ENERGY STORAGE

The market value of storage systems is linked to the possibility to purchase energy in off-peak, cheaper hours and resell it during peak, more expensive hours, thus maximizing the spread between sale and purchase prices. A widespread presence of this type of asset in the electricity system might affect the dynamics of the Day-Ahead Market (DAM) (Mercato del Giorno Prima (MGP)) in relation to energy generation from renewables, reduce price volatility and mitigate the risk of cannibalization.

As already highlighted, **at a European level**, in light of the 2050 climate neutrality target, an increasingly **higher proportion of renewable energies** is foreseen, which will imply a greater volatility of the electricity system and hence the need for **a strong increase in the storage capacity** so as to secure energy procurement.

Decentralized storage of energy by consumers is expected to play an increasingly strategic role: households will be allowed to store the energy generated and use it gradually or become storage units in the grid and offer their e-vehicles' battery storage capacity.

The crisis triggered by the spread of COVID-19 has highlighted Europe's vulnerability in relation to the supply of strategic materials and technologies. In view of the increasingly real transition to green energy, the development of a **European batteries industry** is fundamental for Europe to remain competitive in global markets. At present, essential materials for making lithium batteries (this being one of the most promising technologies) are imported and, in order to reduce dependence on non-EU countries, **it is vital to promote the development and innovation of energy storage within the European Union** by leveraging in the first place on the **recycling of exhaust batteries**.

Several initiatives⁶⁵ have already been started, all of which are in line with the EU environmental requirements, that might enable to meet 80% of mid-term European demand. However, it will be necessary to speed up authorization processes, consolidate innovations in this field and the granting of loans: to this end, EIB loans for projects concerning batteries are increasing and set to exceed €1 billion in 2020.

4.5. THE ROLE OF HYDROGEN

Hydrogen, due to its calorific power and flammability, is an important energy vector and has long been used in the industrial sector. Current consumption amounts to approximately 10 EJ, equal to 1.5-2% of the world's energy consumption.

65. Having regard to the lithium industry self-sufficiency outlook, four projects for the extraction of sustainable lithium for a total of €2 billion were launched in Europe (Spain, Portugal, Germany/Czech Republic, Germany/France) that should come fully on stream by 2022-2024. These projects are meant to cater for up to 80% of the lithium required in Europe by 2025, thus contributing directly towards the strategic autonomy of Europe.

Despite being the most widespread naturally occurring element on Earth, pure hydrogen is not available in nature and must therefore be obtained through processing: at present **96% of hydrogen is made from hydrocarbons**.

Steam Methane Reforming is the most widely used process. It consists in the endothermic catalytic processing of light hydrocarbons (for example, methane, gasoline) using high-temperature, high-pressure water vapor. Another technology is the partial oxidation of heavy hydrocarbons (e.g. petrochemical processing residues) or coal (this being convenient only in those countries such as China and South Africa that produce large amounts of coal). The processing of hydrocarbons described above is a major contributor of CO₂ emissions, save where combined to Carbon Capture & Storage (CCS) systems which are still little used.

However, many observers believe that hydrogen production might become a valuable ally for achieving the global warming reduction targets: boosting RES production is in fact an opportunity to **develop “sustainable” hydrogen**.

One first step towards decarbonizing hydrogen production can be the **combination of hydrogen processing to CO₂ capture and conservation systems**: this is referred to a “**blue hydrogen**” and its large-scale development requires cheaper CCS technologies and a clear regulatory framework for CO₂ storage. In any case, one should specify that blue hydrogen cannot qualify as carbon-free, both for the impact of hydrocarbon extraction upstream and for the effectiveness of CCS processes which, high as it may be, does not allow to capture 100% of the CO₂ produced.

The so-called “**green hydrogen**” is more promising for climate-related targets. It is produced through electrolysis processes driven by **electricity from renewable sources**. Beyond the curve of maturation of the electrolysis-based hydrogen production technologies, it is the development of non-programmable renewable sources that supports the supply chain of green hydrogen. Indeed, the high penetration in some geographies of solar PV and wind energy (in particular offshore) makes available, for several hours a year, significant amounts of energy at extremely low prices (even negative, depending on the rules based on which the market is organized).

The **EU hydrogen strategy**, adopted at the beginning of July 2020, aims for a more efficient and interconnected sector, with the twofold environmental and economic goal. In an integrated energy system, hydrogen can encourage the **decarbonization of industry, transport, electricity production and construction** across the old continent. This strategy intends to tap this potential through ad hoc investments, regulatory measures, the creation of a market, research and innovation.

Due to its being also suitable for sectors that are difficult to electrify, hydrogen can provide storage capacity to offset the variability of renewable energies flows. The top priority is the development of renewable hydrogen, mainly from wind and solar energy. Still, in the short- and medium-term, other forms of low-carbon hydrogen are needed in order to rapidly reduce emissions and support the creation of a profitable market.

This being a staged transition, it requires a step-wise approach, as follows:

- between 2020 and 2024 at least 6 GW of renewable hydrogen electrolyzers are expected to be installed in the EU alongside the production of up to one million tons of renewable hydrogen;
- between 2025 and 2030, hydrogen should be an integral part of the integrated energy system, with at least 40 GW of electrolyzers for renewable hydrogen and the production of up to 10 million tons of renewable hydrogen in the EU;
- between 2030 and 2050 renewable-hydrogen-based technologies should reach maturity and be applied on a large scale in all such sectors as are difficult to decarbonize.

A coordinated European public/private action is needed in order for the strategy to be successful. For this reason, the Commission has launched the **European Alliance for Clean Hydrogen**, which gathers industry players, representatives of the civil society, national, regional and EIB delegates. The Alliance will establish a portfolio of investments aimed to boost production and will support the demand for clean hydrogen in the EU.



THE CHALLENGE OF ENERGY TRANSITION IN THE COMPOSITION OF A BALANCED AND SUSTAINABLE PORTFOLIO

Federico Merola, CEO, Arpinge SpA

Sustainability has become key and is increasingly a must when making investment choices and constructing portfolios meant to help pursue major goals in transitioning to a climate-neutral economy at an increasingly faster pace.

This is the very scenario in which Arpinge has always operated since it was established. Indeed, environmental, social and economic (ESG) sustainability has always been a core component of its activity. Arpinge was set up at the end of 2013 as a pillar I private contribution-based social security project (Cassa Geometri, EPPI and Inarcassa) **investing in the real economy through investments entirely focused on the three key sectors of energy transition: energy efficiency, renewables and mobility** (through the urban infrastructural parking hub). As such, Arpinge has become the leading Italian independent investor in parking spaces with a 100MW RES generation capacity, of which 85% relating to wind power. As regards energy efficiency, it has implemented, in partnership with Conad del Tirreno, an energy requalification project in respect of a number of stores resulting in a 35% energy saving and a CO₂ emissions reduction of approximately 100t per year per store. Overall, the Arpinge portfolio translates in -66,000t of CO₂ per year (equal to the

energy consumption of over 79,000 households) and a benefit mobility-wise, equal to over 37 km of car-free roads.

Still, the pursuit of sustainable goals cannot be an absolute goal and needs to be combined with an effective composition of financial risks in the construction of a solid and stringent asset allocation. The proper balance of investments in the sectors involved in energy transition has until now helped reduce and mitigate the risk profile of the portfolio due to the **historical decorrelation of such sectors**. Indeed, as shown in the table below, these sectors feature substantially different risk categories:

- a.** the renewables sector is essentially characterized by regulatory, interest rate and climate risks (which, in turn, can be mitigated through the geographic diversification of plants);
- b.** the parking sector, instead, is mainly impacted by volume (traffic) risks and risks arising from the relations with Licensors (political and administrative risk);
- c.** finally, energy efficiency is exposed to counterparty credit risk (with counterparties generally paying license fees on a periodical basis) and technological performance.

Since inception, our asset allocation, which is entirely focused on energy transition sectors, has always been and still is able to ensure sustainability and a proper risk allocation and mitigation.

FIGURE 12. The energy transition challenge: Asset & Risk allocation

ASSET & RISK ALLOCATION			RISK CORRELATION		
Sector	Prevailing Risk Category	Counterparty	Renewables	Parkings	Energy Efficiency
Renewables	Incentives/ Regulatory Climate (can be mitigated through geographic and technological mix (sources))	Public (GSE)	N.A.	macroeconomic effects (not proportioned) 	varies depending on interventions macroeconomic effects (not proportioned) 
Parking spaces	traffic Relations with licensor	Market/ Local entities	macroeconomic effects (not proportioned) 	N.A.	
Energy Efficiency	counterparty credit technological performances	Private/ public clients	varies depending on interventions macroeconomic effects (not proportioned) 		N.A.

Source: Arpinge SpA 2020

In recent years, however, **the technological and regulatory evolution in the three energy-transition-related sectors has brought about changes that impact the balance of risks**, especially because **they are more correlated**.

With the fading-out of incentives for renewables and the resulting shift to grid parity based on long-term energy sale and purchase agreements (PPAs), the risk is placed on the market, the counterparty and the structure of the contracts that allocate risks to the various components of the project. Likewise, e-mobility “integrates” the traffic risk and the cost-of-energy risk. As a result, the change in the previous portfolio balance has been emphasized by investments, leading to a greater convergence of the prevailing risks in the three sectors mentioned above (e.g., with smart mobility and energy that takes on the cost risk similarly to renewables with PPAs).

**FIGURE 13. The energy transition challenge:
Asset & Risk allocation following the evolution of renewables and mobility**

ASSET & RISK ALLOCATION				RISK CORRELATION		
Sector	Event	Prevailing Risk Category	Counterparty	Renewables	Parking spaces	Energy Efficiency
Renewables	Fading-out of incentives and use of PPAs Use of storage technologies	Financing Counterparty credit Technological Climate	Private	N.A.	Macroeconomic effects (not proportioned) Renewables installations for columns Technological risk	Varies depending on interventions Macroeconomic effects (not proportioned) Counterparty credit risk Technological risk
Parking spaces	Mobility evolution (smart and energy)	Traffic Technological (smart and energy)	Market/ Local entities	Macroeconomic effects (not proportioned) Renewables installations for columns Technological risk	N.A.	Tech. risk Energy efficiency interventions on complex installations (recharging columns and smart grids)
Energy Efficiency	Technological evolution	Counterparty credit Technological	Private/ public clients	Varies depending on interventions Macroeconomic effects (not proportioned) Counterparty credit risk Technological risk	Tech. risk Energy efficiency interventions on complex installations (recharging columns and smart grids)	N.A.

Source: Arpinge SpA 2020

Arpinge had long before foreseen and analyzed these dynamics and hence pushed investors to rebalance their portfolios, add new sectors and select those that are capable of encouraging a rebalancing towards greater diversification and de-correlation of risks, subject always to eligibility for ESG purposes.

**FIGURE 14. The energy transition challenge:
Asset & Risk allocation – Social infrastructures**

ASSET & RISK ALLOCATION			RISK CORRELATION		
Sector	Prevailing Risk Category	Counterparty	Renewables	Parking spaces	Energy Efficiency
Social Infrastructures	Counterparty credit Vendors performance	Private Local entities/ hospitals	Use of energy and heat from renewables 	Licensor risk Hospital parking spaces 	Activity often included in operational licenses Counterparty risk 

Source: Arpinge SpA 2020

This goal can be pursued, for example, by combining investments in the sectors mentioned above and those in tier-1 social infrastructures (healthcare, education and social housing) which help strengthen the S factor of the entire portfolio. There is a clear need for investments in social infrastructure. For example, according to the final report of the High-Level Task Force on Investing in Social Infrastructure in Europe (promoted by the European Association of Long Term Investors (ELTI) in 2017) the estimated need for investments for the EU (before COVID-19) is €100-150 by per year (with an overall gap of approximately €1,500 billion between 2018 and 2030).

The most widespread **social infrastructures** solution, which is also particularly attractive for institutional investors, is the construction & maintenance license with an Availability Charge. As should be expected, this solution is very similar to a real estate one, though implemented through a PPP, with the possibility, subject to specified conditions, to also solve the issue of the accounting qualification of transactions for the purposes of Eurostat (in terms of Public Administration debt) but which, aside from those aspects as are mainly related to financial statements, can create a strong synergy between the private sector, institutions and local public authorities. One of the instruments that can strongly encourage a widespread use of licenses with an Availability Charge is the Standard License Agreements drawn up by governments and which serve as master agreements by individual local authorities (adjusted as required).

The evolution of energy-transition-related sectors and the diversification of asset-allocation diversification in new areas of investment can offer considerable opportunities in terms of asset synergies which, if properly used, improve portfolio efficiency and mitigate the risk profile.

**FIGURE 15. The energy transition challenge:
Asset & Risk allocation – Possible synergies**

	RENEWABLES	PARKING SPACES	ENERGY EFFICIENCY	SOCIAL INFRASTRUCTURES
Renewables	—	Recharging columns PV roof installations E-engine storage	Storage PV for electricity and heat generation	PV for electricity and heat generation
Parking spaces	Recharging columns PV roof installations E-engine storage	—	Lighting management Re-phasing Aeration	Hospital parking spaces
Energy Efficiency	Storage PV for electricity and heat generation	Lighting management Re-phasing Aeration	—	Lighting management Re-phasing Aeration
Social Infrastructures	PV for electricity and heat generation	Hospital parking spaces	Lighting management Energy and heat management Re-phasing Aeration	—

Source: Arpinge SpA 2020

In conclusion, the implementation of sustainable investment strategies entails, besides the usual challenge of identifying and developing a set of meaningful impact assessment metrics, also that of re-styling resource allocation with a view to constructing a portfolio that is sustainable in economic and social terms and characterized by an optimal asset allocation, that is to say with a low correlation of risks, more balanced and resilient.



DECARBONIZATION AND INCREASED ELECTRIFICATION: UTILITIES' PRIORITIES FOR THE DECADE AHEAD

Velina Karadzova, ESG senior analyst, MSCI

Today, **around 60% of the world's electricity is generated using fossil fuels**. This share has remained flat in the past 20 years, despite international climate change agreements, such as the Paris Agreement, aiming to limit carbon emissions and global warming to below 1.5°C (BP 2018). In order to meet the Paris Agreement targets, the global electricity system would need to phase out existing fossil fuel-based generation. At the same time, decarbonization for other sectors, such as transport, could drive up the global electricity demand. **The increase in electricity demand and a phase out of fossil fuels could require substantial investments in new zero-carbon capacity**: an estimate from the International Energy Agency (IEA) suggested a fivefold increase by 2030 and 13 fold by 2050 vs. 2014 baseline. By 2050, there will be a 90% cut in operational emissions from power generation, more than any other sector. A massive task to deliver, while the clock is ticking fast.

Estimates by the Intergovernmental Panel on Climate Change (IPCC) pointed out that the carbon budget could be exhausted between 2026 and 2033, if the current level of emissions persists (UNEP 2019). At the same time, the capital-intensive nature of power generation with long lived assets presents additional challenges for the sector. As per MSCI ESG Research's analysis, **utilities might need more than a decade to decarbonize their asset base and to recover previously invested capital**.⁶⁶

So, how could this potentially affect investors? Long-term institutional investors could need to account for decarbonization trends at present, as the future climate resilience of their portfolios could be heavily influenced by their capital allocations today. Investments that support the energy transition could reduce potential exposure to stranded assets and increase the opportunity to benefit from growth in zero-carbon technologies.

MSCI ESG Research provides various tools for investors to assess companies' relative exposure to climate change risks and opportunities. For instance, the Low Carbon Transition Risk assessment (LCT) is designed to identify potential leaders and laggards by holistically measuring companies' exposure to and management of risks and opportunities related to the low carbon transition. The exposure is measured through two risk transmission

66. Based on annual depreciation and property, plant and equipment for financial year 2018 available in Thomson Reuters Eikon for 100 utilities, constituents of the MSCI ACWI Index as of July 2019. Outstanding property, plant and equipment as of December 2018 amounted to around \$2 trillion and the annual depreciation and amortization for financial year 2018 was around \$110 billion. Assuming no further investments and a similar level of asset operation, the existing asset base will be fully depreciated in almost 20 years' time.



channels – operational transition and product transition. Risk management assessments are based on companies' policies and commitments to mitigate transition risk, for example through carbon reduction targets. The final output of the LCT assessment results in two company-level factors – a transition category and a score.

MSCI ESG Research has defined **five transition categories**:

- 1. stranded assets** – potential to experience stranding of physical or natural assets (e.g. coal mining);
- 2. product transition** – reduced demand for carbon-intensive products and services (e.g. oil and gas extraction);
- 3. operational transition** – increased operating or capital costs due to carbon taxes or to comply with low carbon operational standards (e.g. fossil fuel power generation, cement);
- 4. neutral** – limited exposure to low carbon transition risks and opportunities (e.g. healthcare);
- 5. solutions** – potential to benefit from the transition (e.g. renewable electricity generation).

As of July 2020, 45% of the utilities for which an LCT assessment is available⁶⁷ fell under the operational transition category, indicating the required asset transition in the sector.

The tool could help inform investors' actions to **re-allocate capital from challenged carbon-intensive businesses towards activities that could benefit from the low carbon transition**. An active investment approach could supplement traditional financial analysis with LCT results. A passive investment approach could utilize the LCT results in portfolio construction. For example, the TEG has proposed using portfolio carbon intensity as a parameter for climate benchmarks. The LCT score also forms the basis for the construction of the MSCI Climate Change Indexes.

To finish off on a positive note, despite the huge challenge ahead, utilities could also benefit from being a key enabler of decarbonization. Some could profit from growth opportunities presented by low-carbon technologies. At the same time, as related disclosures and regulations strengthen, the tools available to investors could also improve, enabling institutional investors to allocate capital to more environmentally and financially resilient activities.

67. Available for 479 public and private companies classified as utilities following MSCI ESG Research classification and for over 9,000 public and private companies overall.

5.

Financing other mitigation and adaptation solutions



Chapter 5 highlights investment opportunities in such areas as are crucial in terms of climate-change mitigation and adaptation: farming and forests (§5.1.), transport and mobility (§5.2.), cities and construction (§5.3.), digital technologies (§5.4.). These sectors, similarly to the energy sector discussed above (see Chapter 4), are all included in the taxonomy of environmentally-sustainable activities with reference to climate targets (see p. 37). Transitioning to the circular economy (§5.5.) is one of the six European environmental goals and significantly helps reduce GHG emissions.

Furthermore, all of these areas are suitable for public-private partnerships in the post-COVID-19 recovery in view of pursuing social, economic and climate targets in one go.

5.1. FARMING AND FOREST

Alex Pra, Sustainable Investment Project manager, ETIFOR - A Spin-Off of University of Padua

Federico Pinato, Sustainable Investment Project officer, ETIFOR - A Spin-Off of University of Padua

Lucio Brotto, Business Development Director, ETIFOR - A Spin-Off of University of Padua

Farming and forests are **profoundly interconnected** and their **relation to climate is rather complex**. On the one hand, the mitigation actions associated with these two sectors amount to effective, strategic solutions to counter the climate crisis. As a matter of fact, plants have the unique ability to absorb the main greenhouse gas (CO₂) and retain it in the biomass and soil. Forests and other terrestrial ecosystems such as peatlands, wetlands, mangroves and grasslands are in fact carbon sinks and as such they are essential for regulating and mitigating climate change. It is estimated that **29% of the CO₂ released every year by human activities is retained by forests and other terrestrial ecosystems** (IPCC 2019).

Still, the latest IPCC report states that the farming and forestry sector is one of the main **contributors of GHG emissions**, with an estimated **24% of total emissions from human activities** (which goes up to 37% if we consider the entire agri-food chain, including food processing and food waste). This is partly due to **farming production** (including breeding) which accounts for approximately **11%** of total GHG emissions, mainly related to the use of energy from fossil fuels, soil fertilization and, to a large extent, animal breeding. The other major share, which accounts for **13%** of global emissions, is from **tropical deforestation**⁶⁸. When forests are destroyed, large amounts of retained CO₂ are released in the atmosphere thus adversely contributing to the balance of emissions. So, the connection between farming and forests is extremely clear if we consider that

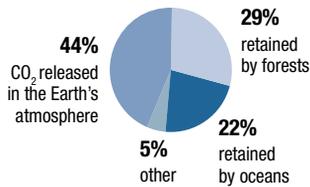
68. According to FAO, deforestation is the permanent conversion of forest to another land use, regardless of whether this is due to human activities, including the long-term reduction of tree canopy cover below the 10% threshold and the conversion of forest to farming, grassland, water basins, mines and urban use. This excludes areas of tree removal for timber and where forests regenerate naturally or through reforestation.

tropical deforestation is essentially linked to the expansion of farming and grassland to the extent of an estimated 80% (CIFOR 2012).

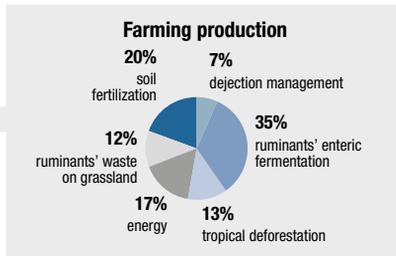
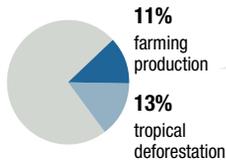
Furthermore, **the farming and forestry are among the most vulnerable to climate-related physical risks**: suffice it to think of the increase in frequency and severity of extreme weather events that hit forests and farming (e.g. storms, fires, drought, parasite attacks, etc.). Hence, adaptation and climate-related risk are key for climate-related sustainable investments.

FIGURE 16. Impact of the farming and forestry sector on climate

Where does the CO₂ emitted every year end up in?



To what extent does the Farming and Forestry sector contribute to total CO₂ emissions?



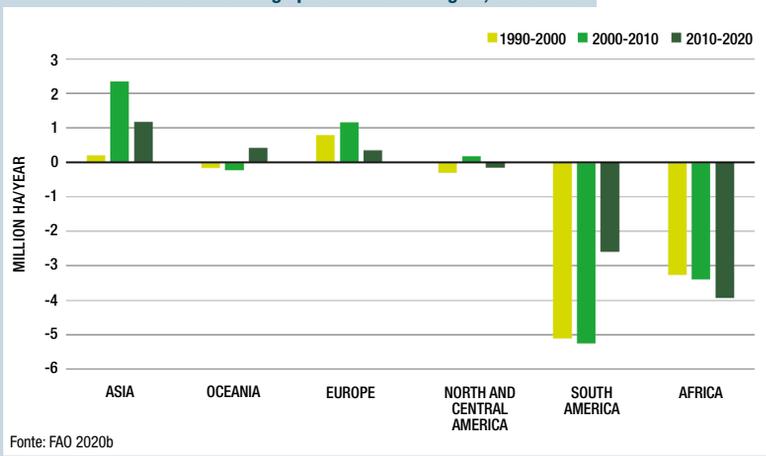
Source: Etfor elaboration

THE STATE OF FORESTS ACROSS THE WORLD

According to the latest UN FAO report on the state of forests (2020b), **forests cover 4.06 billion hectares worldwide, or 31% of the Earth's surface** (Figure 17).

Despite the clear need to end **deforestation** and notwithstanding the efforts made, over the last decade an average 4.7 million forest hectares have been lost every year (a surface almost equal to that of Piedmont and Lombardy combined). However, the **global situation is mixed**; in fact, deforestation is an issue mainly in tropical and subtropical areas, whereas temperate and boreal forests are expanding because marginal land is left untended (Figure 17).

FIGURE 17. Net forest area change per decade and region, 1990-2020



Nature-Based Solutions (NBS)

Given the unique ability of plants to absorb and store CO₂, mitigation policies increasingly consider farming- and forestry-related actions, also known as “**Nature-Based Solutions**”, which are among the most effective and strategic options, including cost-wise, to achieve mitigation targets. According to a recent study, published by an authoritative IPCC working group (Griscom et al. 2019), Nature-Based Solutions **can contribute over one third of GHG emissions reduction by 2030** based on the targets of the Paris Agreement and of the UN Framework Convention on Climate Change.

These solutions, illustrated in Figure 18, refer to a number of actions for plant and land conservation, restoration and improved management. They can be grouped in **four macro-categories**:

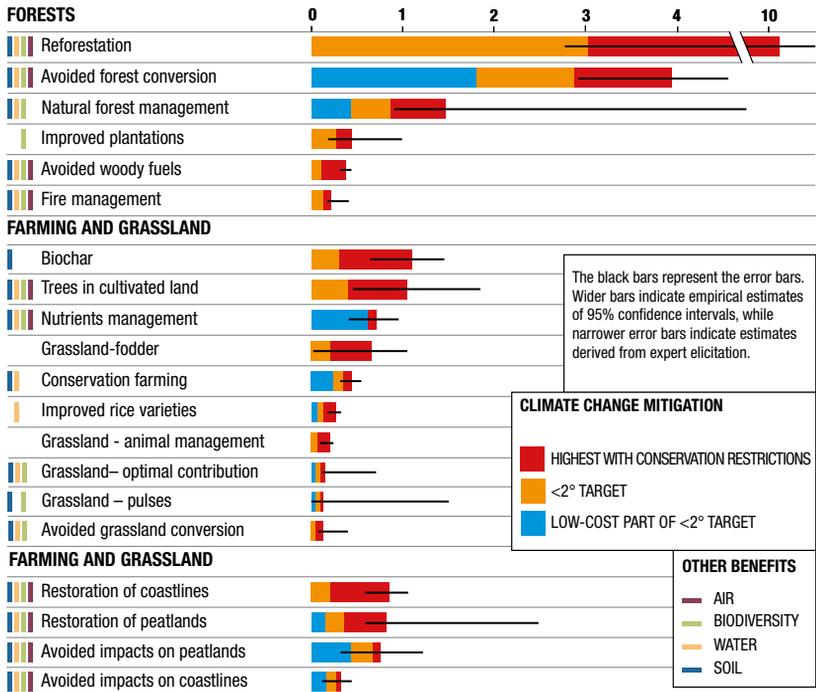
- 1. reduction of the emissions from deforestation** and degradation of forests and terrestrial ecosystems;
- 2. increase in carbon sinks through reforestation and restoration of terrestrial ecosystems;**
- 3. active and sustainable forest management;**
- 4. sustainable farming.**

The effectiveness of these actions significantly varies by **geography**. In tropical and sub-tropical areas, actions to counter the conversion of forests to other uses are a priority, including cost-wise. In densely populated, intensive-farming countries, where food security is particularly critical, the most effective actions are conservative and regenerative farming so as to increase the amount of CO₂ stored in the soil as well as actions aimed to improve logistics and reduce food waste. In other areas, such as Europe, with significant and continuously expanding forest areas (approximately 42% of the EU territory), a lot can be done to improve forest management. In the European Union, indeed, the *2030 Climate and Energy Framework*⁶⁹ targets and the commitments undertaken with the Paris Agreement are in line with the new European Forestry Strategy (European Commission 2013) that aims to enhance the mitigation potential of forests through active and sustainable forest management so as to both protect forests from the risks they are increasingly subject to (fires, storms, parasite attacks, etc.) and to help transitioning towards bio-economy by encouraging the substitution of fossil fuel-based energy-intensive materials with organic and renewable materials (such as timber for construction instead of steel and concrete).

69. For more information: <https://bit.ly/3cNpQ5i>

FIGURE 18. Effectiveness and cost of implementation of Nature-Based Solutions

Potential climate change mitigation by 2030 (Pg Co₂ e/year)



Note: 2030 mitigation of 20 Nature-Based Solutions (NBS), expressed in CO₂ petagram-equivalent per year (Pg CO₂e/year) (1 petagram = 1 gigaton = 1 billion tons). The bar length represents the maximum mitigation potential obtainable with each NBS, subject conservation restrictions imposed for other needs (food security, protection of biodiversity, etc.); the orange portion of each bar represents the mitigation that can be cost-effectively obtained (< \$100 per MgCO₂ per year) targeting a global temperature increases under 2°C and the blue portion is the low-cost mitigation option (< \$10 per MgCO₂ per year) assuming the same target.

Source: ETIFOR from Griscom et al. 2019

Instruments for investing in farming

Farming offers quite a few options to investors. A variety of instruments are available to invest in this area, including:

- direct acquisition of the securities of companies operating in the farming or agri-food compartment;
- investments in specialized investment funds (including ETFs);
- direct acquisition and/or management of farmland, which is a potentially interesting investment instrument for investors.

The relation between farming investments and the need for climate-aligned portfolios is particularly complex, including because themes of paramount importance are at play, such as food security and biodiversity. Guidance on **climate-aligned farming investments** could be based on **three broad indications**:

1. divest from deforestation-linked supply chains and companies, especially in tropical areas;
2. re-orient investments towards low-climate-impact supply chains;
3. analyze and select investable companies based on the presence of climate-related performance targets.

As most farming emissions are linked to tropical deforestation and conversion of forests to farmland and grassland, the first indication is to **disinvest from deforestation-related supply chains and companies**. While the focus should be on the commodities with the strongest impact on deforestation globally, that is to say **red meat, soy, palm oil, coffee** and **cocoa** (ETIFOR 2020), one should not lose sight of the impact of farming byproducts such as cowhide and leather. For these supply chains no reliable certifications⁷⁰ are available and therefore investors should add an analysis of the risk of deforestation to the screening and due diligence process. Over the last few years, a number of **instruments** have been developed that can support this type of analysis, for example:

- **Trase** (<https://trase.earth>): the platform launched by the Stockholm Environment Institute and by the Global Canopy, that provides information on the commercial flows and risk profiles of specified supply chains, regions and companies. Recently, this platform has adopted a specific toolset for the financial sector (<https://trase.finance/>);
- **SupplyChange** (<https://supply-change.org/>): this initiative is financed by the United Nations and the Global Environment Facility in collaboration with CDP and WWF; it aims to provide information on the companies that have declared a “zero deforestation” target, by monitoring their actions and actual progress.

The theme of **embedded deforestation** is increasingly important, including at a political and institutional level, thanks also to initiatives such as the 2014 New York Declaration on Forests⁷¹ and the 2015 Amsterdam Declaration Partnership⁷². Interestingly, the European Commission is working out a proposal

70. In recent years, a variety of initiatives have been taken for working out certification schemes, audits, sector-wide agreements and labeling such as the Roundtable on Sustainable Palm Oil (RSPO), the Roundtable on Responsible Soy (RTRS), the Leather Working Group (LWG) and the Roundtable on Sustainable Biofuels (RSB) to engage the various players of the individual supply chains and improve product sustainability and traceability. However, at present, these tools do not amount to robust and recognized guarantee systems for investors. In many cases, the effectiveness of these initiatives has been questioned by academic studies or environmentalist organizations.

71. For more information: <https://forestdeclaration.org/>

72. For more information: <https://ad-partnership.org/>

for the introduction of a new “zero-deforestation” certification for all products with supply chains that may cause direct and indirect damage to forests (European Commission 2019b).

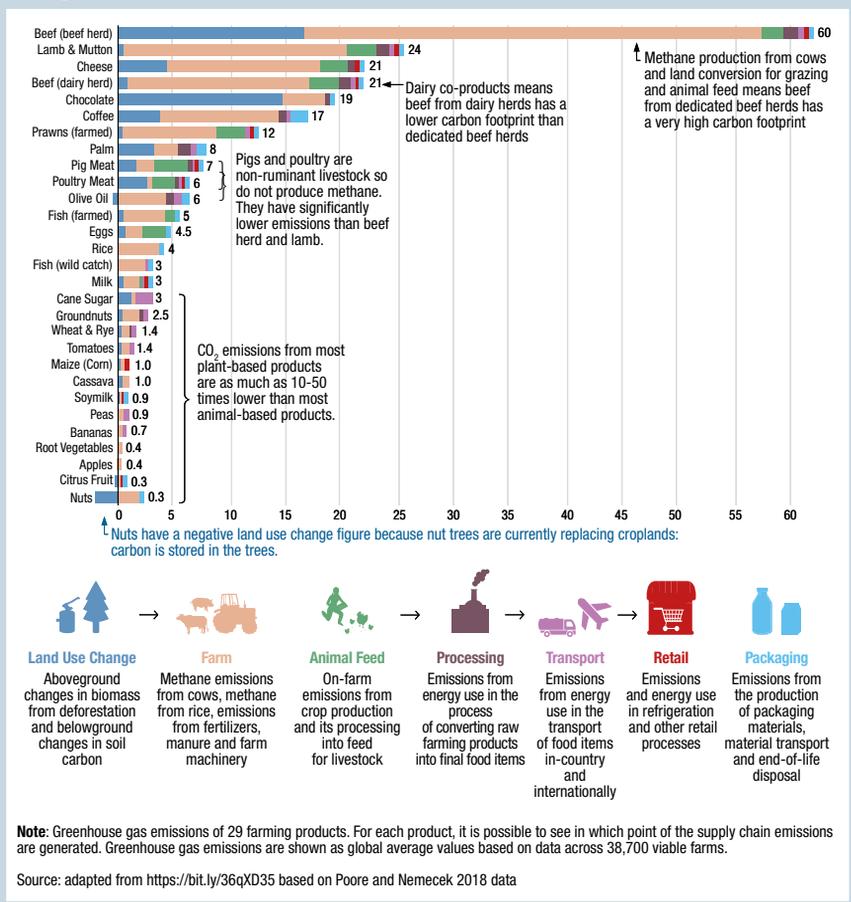
The second indication, that is to say **re-orienting investments towards low-climate-impact supply chains**, is based on the fact that there are very significant differences between the different farming supply chains as regards the level of GHG emissions. This is illustrated concisely in Figure 19, based on an authoritative study published in Science (Poore and Nemecek 2018) that compared the main farming supply chains based on the estimated GHG emissions per kg of product. In a nutshell, the impact of animal-derived products tends to be higher compared to that of plant-derived ones; the elements of the supply chain that generate most of this impact are change in land use (from forest to farming) and farming itself, whereas processing, packaging and the distribution of products contribute relatively less to total emissions. Here again, investors should try to add these considerations to their analyses and stock selection.

Finally, the third indication is to **analyze and select companies that are set on a course of climate performance improvement** and have put in place sustainable farming good practices and climate-smart practices, that is to say with no or limited adverse climate effects. Along these lines, several certification standards, trademarks and protocols are available that can guarantee the practices and commitments of the companies in the farming sector. A tool that can support investor choose from among these tools is the **Sustainability Map**⁷³, a platform financed by the European Commission, US AID and the governments of Germany, Sweden and Switzerland, that provides information on over 260 sustainability standards, including in the farming sector. Finally, mention should be made of the new standard (launched in 2020) for **Sustainable Farming**⁷⁴ arisen from the merger of the Rainforest Alliance and UTZ, which considers the impacts, in terms of deforestation, climate, biodiversity and human rights, of the companies operating in the farming sector, in particular in tropical areas.

73. For more information: www.sustainabilitymap.org

74. For more information: www.rainforest-alliance.org/business/certification

FIGURE 19. GHG emissions per kg of food product (kg CO₂-equivalent per kg of product)



Instruments for investing in forestry

Climate investing is relatively simpler in the forestry sector compared to the farming sector. In the first place, because this sector is **more advanced in terms of sustainability guarantees and impact measurement**. Already in the early 1990s, as the notion of sustainable management of forests gained ground at an institutional level⁷⁵, the sector saw the emergence and development

75. According to the most widespread definition (the one adopted in 1993 by the Ministerial Conference for the Protection of Forests in Europe), sustainable management of forests means “the stewardship and use of forests and forest lands in a way and at a rate that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions at a local, national and global levels, and that does not cause damage to other ecosystems”.

of a considerable number of instruments for measuring and guaranteeing the application of the notion of sustainability to forest management and measurement of the beneficial ESG impacts of forests. The most widespread and recognized certification system internationally is the **Forest Stewardship Council (FSC®⁷⁶)**, established in 1993 as the reference international entity for certifying the sustainability of the management of forests and of the chains of custody of forest-derived products.

In the second place, investing in the forestry sector ensures alignment with climate goals because forests have a **huge strategic potential for mitigating climate change**, with a **twofold contribution**: a **biophysical action** in terms of capturing and retaining CO₂, plus **indirect storage** (given that the CO₂ captured by trees remains stored in the biomass also during the life cycle of woody products) **and substitution** deriving from forestry supply chains. This last element, in particular, is linked to the development of **bio-economy**, in which the forestry sector plays a central role: indeed, the most interesting biotechnological developments relate to the use of timber for the production of bioenergy, bioplastics, biofabrics, drugs and other products substituting fossil-derived products.

Finally, one should highlight that forest-related benefits are not limited to climate action alone but also concern other products (for example, medicinal plants, cork, natural resins, fruits, mushrooms and truffles etc.) and, especially, **services referred to as “eco-systemic”** (for example, **regulation of the water cycle, land conservation, protection of biodiversity**, etc.) that are essential for humans. Considering that the habitat of over 80% of the Earth’s species is in the forests, the protection of biodiversity is very important as the latter is the main driver of the wealth and ability of ecosystems to provide services. Finally, it is worth highlighting that recent events connected to the COVID-19 pandemic have shown the **crucial role of forests in countering viral zoonosis**: in fact, the spreading of new viruses in the human population is in many cases due to deforestation and degradation of tropical forests and, in particular, of their fauna which is used as food (as in the case of the Nipah disease, SARS and Ebola (Di Marco et al. 2020)).

From the financial point of view, the **instruments for investing in the forestry sector** include the following:

- securities of listed **companies that operate in the forestry sector**;
- **thematic funds** managed by Timber Investment Management Organizations (**TIMOs**) or Real Estate Investments Trusts (**Timber REITs**);
- **acquisition and/or direct management of forest areas**.

76. For more information: <https://it.fsc.org>

In particular, the benefits for investors of a **sustainable management of forests as an asset class** are clear not only in relation to alignment of investors with environmental and climate-related goals, but also from a strictly financial point of view. These benefits are essentially related to the **ability to reduce the risk component in the investment portfolio**, given that the rates of return of forestry investments have a weak or non-existent connection with those of the asset classes. Indeed, the biological growth of trees, which is the main component of yield, is independent from macroeconomic conditions and financial markets. Furthermore, forests ensure the **preservation of the capital invested**, due to their being factories and warehouses at the same time: their management implies both the production of timber, the value of which increases as trees grow, and its conservation on site, with the flexibility to choose the time of use and sale, which can be established based on market conditions.

In recent years, the capital invested in sustainable forest management by institutional investors globally has grown exponentially, from approximately \$10-15 billion in the first three years of 2000 to over \$100 billion today (PRI 2019). Furthermore, in 2018 as many as 93 signatories of PRI (out of a total of 1,400+), mostly concentrated in Europe and North America, reported that they have investments in the forestry sector, against 60 in 2014⁷⁷.

77. More information on forestry investments can be found in paragraph 4.4. ("Forests and Sustainable Farming") of the handbook *Impact Investing: la finanza a supporto dell'impatto socio-ambientale* ("Impact Investing: Finance Supporting Social and Environmental Impacts") (FFS 2017).



CO₂ COMPENSATION AND FORESTS: THE IMPORTANCE OF A CONSISTENT AND STRUCTURED APPROACH

Tree planting, reduction of deforestation and improvement of existing forests are increasingly used by companies outside the forestry sector to **compensate their CO₂ emissions** and reduce their adverse impact on climate. Still, undisputed as the mitigation potential of forestry actions is (see Figure 18), one has to consider that these actions alone are **not enough**. The root of the problem, which underlies the climate crisis, is to be found in overuse of fossil fuels, which is responsible for most of the greenhouse gas emissions in the atmosphere. For this reason, it is unprecedentedly urgent for companies across all sectors to combine compensation actions with **consistent and structured actions for reducing emissions**. Over the last decades, several **tools and methodologies** have been developed which are now available to those who decide to consistently and structurally improve their climate impact. Set out below are the four main actions included in the approach of the most advanced companies in this field – that is to say the organizations that aim to be climate neutral or even climate positive⁷⁸:

- 1. start from the identification and measurement of the impacts** of activities and products, which is relatively easy to do with tools such as the **Carbon Footprint Assessment** or the **product Life Cycle Assessment (LCA)**, an international structured, comprehensive and standardized method used to quantify all relevant emissions, resources consumed and related impacts on the environment and health;
- 2. commit to avoid or reduce emissions and adverse impacts right from the start:** investments in renewable energies and sustainable mobility, improvement of the energy efficiency of buildings and machinery, substitution of high-impact materials with low-impact ones, design of products aimed to encourage reuse and recycling are but some of the actions that every company can, to some extent, implement;
- 3. analyze the new risks (and opportunities)** arising from a context of climate crisis: these can be either climate-related (for example: prolonged drought, storms, etc.) or aimed to “transitioning” to a low-emission economy (for example, more stringent regulations) or reputational (with a public opinion that is increasingly more sensitive to environmental themes, those companies that fail to prove that they are set on a course of environmental responsibility might be attacked or boycotted); here again, multiple tools are available⁷⁹;

78. See the examples of Patagonia (<https://bit.ly/3eJm3a0>) and IKEA (<https://bit.ly/3nbPENx>). These approaches can also apply to the financial sector, see for example the approach of Etica Sgr with its fund Etica Azionario.

79. For example: ENCORE (<https://encore.naturalcapital.finance/en>)

4. being aware that there will always be impacts and emissions that cannot be eliminated, it is important to **compensate by supporting forestation projects as well as projects for the conservation and restoration of terrestrial ecosystems**. It should be noted that rather than being isolated, point-in-time interventions, these are part of a broader strategy or, as said above, of a consistent and structured model to counter the climate crisis.

Finally, the **communication** of the course of sustainability started is equally important. Here again, reference can be made to the recommendations of the TCFD, the GRI standards, or the framework of the Climate Disclosure Standards Board.

NATURAL CAPITAL: INVESTING IN NATURE

Barbara Galliano, Deputy Country Head, Head of Retail Distribution, Natixis Investment Managers Italian Branch

Natural capital investments aim to meet environmental challenges such as climate change and the protection of land, biodiversity, soil and sea resources. In order to be able to address this challenge, it is going to be indispensable to combine public finance and private resources.

Natural capital investment is the **investment in solutions that are closely connected to natural resources**, that is to say in sustainable economic models based on production from natural systems such as land and oceans. This includes sustainable farming, forestry and fishery as well as investments in conservation and protection of biodiversity.

This relatively recent asset class is by now unavoidable in many areas and particularly in the fight against climate change and aims to address many other social and environmental issues such as supporting a growing population and countering conflicts and involuntary migrations.

The “Social” component of ESG

The world population increase is going to bring along an increasing demand for foodstuffs. Farming causes the loss of millions of hectares of rainforests every year. It is therefore



important to develop a more sustainable farming that does not need to destroy forests, degrade soil and cause the extinction of animal and plant species to the detriment of the livelihood of millions of people in developing countries and of the quality of the products sold in developed countries.

Having regard to the oceans, 90% of those who make a living out of fishing are in emerging countries, seaside tourism employs 277 million people and a total of 350 million jobs worldwide depend on activities related to the oceans (Mirova 2018).

Regardless of whether one invests in land or in the oceans, a greater focus is needed on the S – the social factor – of the ESG equation. Natural capital investments can help meet this need.

With a primary role in sustainable investing, Mirova – a company of the Natixis IM group – combines far-sightedness and the skills required to grow the natural capital market. The company manages \$300 million worth of investments on this theme⁸⁰ and continues to generate new initiatives and opportunities.

For example, Mirova has a long history of managing strategies specializing in social impact innovative investments, through the identification of initiatives targeting marine and coastal projects with the goal to generate a sustainable economic return from fishing, aquaculture, fishery supply chains, sea waste recycling and the protection of the marine environment. The company also collaborated with the United Nations on the first investment initiative that leverages public finance to attract private capital for sustainable development and land protection projects. In 2020 the British Ministry of the Environment provided £10 million for this strategy as part of its program of international climate finance.

Teamwork

The crux of the matter is the **lack of long-term finance** in the natural capital sector. Nature-based investments are considered to be too risky and it is believed that they still offer poor visibility on future cash flows.

As such, **blended finance** is also needed, that is to say public and private capital solutions to channel investments to sustainable development projects. This investment opportunity meets all the requirements to be understood, assessed and supported by a growing number of institutional investors.

An example of how blended finance can work in natural capital solutions is an initiative – announced at the beginning of 2020 in Davos at the WEF – with Mirova as the lead investment advisor and the Dutch government and Rabobank as lead investors. This initiative intends to channel commercial banks finance towards projects that support the

80. Source: Mirova, data as at December 31, 2019.



transition to a more sustainable farming and the protection of forests.

The transformation of farming production systems requires considerable funds and this initiative aims to free up \$1 billion for sustainable farming and sustainable land use without deforestation. Moreover, it will provide de-risking financial instruments and subsidies for technical support to the food supply chain and farmers in particular.

All beneficial impacts are measured against a global environmental and social framework developed in close collaboration with the UN Environment Program. A separate technical support instrument will also strengthen the transition towards sustainable land use through the agreements and investments under this initiative, besides ensuring larger-scale sustainable innovation in farming for other farmers.

This is a great example of how natural capital investment can work in practice, and points the way to a future in which public and private investors can join forces through partnerships with governments with the goal of generating beneficial impacts and positive returns. After all, the future of the Earth and seas will increasingly depend on its success.

DISCLAIMER

Before agreeing, read the prospectus and the KIID available from distributors. This text is informative only and should not be interpreted as investment advice or a recommendation or an offer to purchase or sell any securities or an offer of services. All investments entail risk, including the risk of capital loss. Investors should carefully consider their investment goals, risks and charges of any investment before investing. The views and opinions expressed herein are as at the date shown and may change depending on market and other conditions. There is no guarantee that developments will be as foreseen.

This text is provided by Natixis Investment Managers S.A., an asset management company, or by its Italian subsidiary Natixis Investment Managers S.A., Succursale Italiana, a company included in the list attached to the Register of SGRs held by the Bank of Italy under # 23458.3. Natixis Investment Managers S.A. (RCS B 115843), 2 rue Jean Monnet, L-2180 Luxembourg, Grand Duchy of Luxembourg. Natixis Investment Managers S.A., Succursale Italiana, Via San Clemente 1, 20122 Milan, Italy.

5.2. SUSTAINABLE TRANSPORT AND MOBILITY

According to the latest statistics of the European Environmental Agency (EEA) the **transport sector accounts for 24.6% (one fourth) of the EU GHG emissions** (Statistical Pocketbook 2019). Most emissions (71.7%) are from **road transport**; two more significant sources of emissions are **civil aviation** (13.9%) and **waterways** (13.4%) (European Commission 2019c).

In Italy, the transport sector accounts for 24.4% of GHG emissions and 33.7% of the domestic energy requirement (ISPRA 2019).

In Europe, 2017 transport emissions were 28% higher than the 1990 average⁸¹. In Italy between 1990 and 2017 emissions were up by almost 4% (EEA 2019d).

In addition, transport contributes to **atmospheric pollution**: the sector originates at least 40% of PM 2.5 (EEA 2019a), the pollutant responsible for the highest number of casualties in 2016 (374.000) (EEA 2019b). Since 2000 **emissions of pollutants declined**, including as a result of a number of actions taken by the European Union such as the standards set for the pollutants released by vehicles (Euro 1-6 system) and environmental quality requirements for fuels.

The measures to restrict the circulation of people and goods introduced to curb the spread of COVID-19 have had a significant impact on the transport sector. As to atmospheric pollution, in many European cities that have been locked down, the EEA has recorded a **reduction in the concentration of nitrogen dioxide**, a pollutant generated by combustion processes that is mainly produced by motor vehicles (EEA 2020). The EEA points out, however, that other components of atmospheric pollution did not decline (such as for example PM 2.5, which is generated by other sources such as the heating systems of buildings).

CONNECTING EUROPE FACILITY is the European instrument for financing infrastructural projects, including in the transport sector. Under the European Green Deal Investment Plan, 60% of the budget will be allocated to initiatives aimed to achieve climate-related targets: the EU Green Deal foresees to use this instrument to finance service automation and digitalization interventions. For example, with these resources a project was started for managing goods traffic in the Swedish port of Goteborg through self-driving e-vehicles and innovative software to monitor and coordinate loading and unloading⁸².

European policies for environmentally -sustainable mobility

Under the **EU Green Deal** the European Commission **set out to reduce emissions from transport by 90% by 2050**, with actions in all mobility sectors.

These actions have been foreseen:

- **diversify the means used to transport goods**, through a reduction of high-polluting systems – such as road transport – in favor of low-emission

81. Excluding international maritime transport.

82. For more information: <https://bit.ly/36pd9N7>

ones such as railways and waterways;

- **increase digitalization**, by integrating in road and urban infrastructures such tools as are capable of reducing congestion and pollution, especially in urban areas;
- **modulate transport prices to better reflect impacts on the environment and health**, for example, by ending fossil fuel subsidies, reforming tax exemption and emission quotas exchange systems and introducing more effective rates for road transport;
- **strengthen the production and offering of sustainable alternative fuels** from renewable sources, such as electricity, hydrogen and biofuels⁸³;
- **reduce pollution, especially in cities**. In order to achieve this goal, the European Commission will proceed with a set of combined measures aimed to reduce emissions and congestion in urban areas and improve public transport (see Box “Urban Mobility”, p. 117).

In the Next Generation EU recovery plan, the European Commission highlighted **the crucial role of transport for the functioning of supply chains and business activities**. All public investments aimed to support the recovery of this sector will have to come along with **commitments by companies to invest in more sustainable and lower-environmental impact systems**.

*In Italy and Poland projects have been financed through the **LIFE PROGRAMME** to equip cars with components made from more lightweight materials and using renewable energies. Thanks to these initiatives, 30.000 new cars have been made that are equipped with innovative components which can reduce by 8% the emissions of carbon dioxide, a highly polluting agent (European Commission 2020b). The European Green Deal Investment Plan provides for a 72% increase in the endowment fund of the LIFE program, to €5.4 billion; 60% of the budget will be devoted to projects with beneficial climate impacts.*

Italian policies for a more environmentally-sustainable mobility

In Italy, the strategy for reducing the environmental impact of the transport sector by 2030 is set by the **National Integrated Plan for Energy and Climate**, published in December 2019 and updated in 2020 to align with the novelties of the EU Green Deal. The initiatives and goals for mobility fall in five courses of action under the plan:

- decarbonization;
- energy efficiency;
- energy security;

83. Biofuels (be they liquid or gaseous) are produced from biomasses, that is to say waste and residues from farming and forestry activities and related processing, and from the biodegradable portion of industrial and household waste and wastewater.

- development of the domestic energy market;
- research, innovation and competitiveness.

Out of the €186 billion deemed necessary to achieve environmental and climate-related targets by 2030, 27 refer to the transport sector (motor vehicles only); in addition, for the development of sustainable mobility systems, significant **interventions** are foreseen **for strengthening the electricity system** (grids and storage) which between 2017 and 2030 need **€16 billion additional investments** (MISE 2019).

For an in-depth analysis of the transport system, the NICEP refers to the document ***Elementi per una Roadmap della Mobilità Sostenibile*** (“Elements for a Roadmap of Sustainable Mobility”) drawn up in 2017 thanks to the collaboration between the Ministry of the Environment and for the Protection of Land and Sea, the Ministry of Economic Development, the Ministry of Infrastructures and Transport, research entities, industry players and consumers’ and trade associations. The following are among the priorities listed:

- construction of an innovative technology-based industrial supply chain of vehicles;
- development of a vast infrastructural network for alternative fuels;
- local policies that encourage sustainable mobility;
- education of people movement (through web-conferences, teleworking and smart working as well as online services).

The car sector and the opportunities of electrification

The car industry has been one of the hardest hit by the COVID-19-related restrictive measures, with both production and demand plummeting. One opportunity to support the recovery while curbing the environmental impact of the sector is **transitioning from internal combustion engine vehicles to electric vehicles (e-vehicles)**. The latter can be full electric (equipped with **e-batteries** only) or **hybrid** (alternating two engines, of which an electric one and a gasoil- or gas-operated heat engine). In the following pages, the term “e-vehicles” will be used to generically refer to both types.

E-vehicles still account for a modest share of the car market; however, the sector has recorded a **significant progression** in recent years. Based on IEA findings, in 2019 over 2 million e-cars were sold – up 6% over the previous year and equal to 2.6% of the overall market (which stood at 2.4% in 2018 and 1% in 2017).

Several market analyses foresee that, despite the impact of the pandemic, the sector will continue to grow in the long term⁸⁴. By 2040, according to Bloomberg New Energy Finance (BNEF), 500 million e-vehicles will circulate.

84. In particular, sales of e-vehicles will continue to increase to hit 8.5mn in 2025 (equal to 10% of the total), 26M in 2030 (28%) and 54Mb in 2040 (58%). China and Europe combined will account for 72% of new registrations in 2030 (BNEF2020).

The market expansion results from the combined effect of multiple factors:

- **fast technological improvement**, especially in terms of efficiency, life cycle and fast battery recharge;
- **investments in enabling infrastructures** with a view to establishing a capillary recharge network;
- **progressive reduction of production costs**, of batteries in particular, which were already down 87% between 2010 and 2019;
- **government action**, through the introduction of market incentives, GHG emissions regulations for road transport and policies aimed to progressively reduce circulation of internal combustion engine cars;
- **investments in the companies** involved in the supply chain: in 2019 in Europe public and private investments in this sector (production of vehicles and batteries) totaled €60 billion, 19 times more than the previous year (European Federation for Transport and Environment AISBL 2020).

In turn, these factors are driven by market size increase. Finally, according to BNEF **e-vehicles and internal combustion vehicles will attain price parity around 2025**: quite a significant achievement indeed, as this means that the market would no longer need incentives.

ENVIRONMENTAL AND SOCIAL BENEFITS OF E-VEHICLES

Reduction of atmospheric pollution

Differently from internal combustion vehicles, e-vehicles **do not generate exhaust emissions**⁸⁵, contributors of pollutants, especially nitrogen oxides, which cause irritations and respiratory problems and add to the formation of acid rains (EEA 2019c). The shift to e-vehicles would be considerably beneficial in terms of: **reducing air pollution** – especially in urban areas – **improve the health conditions of citizens** and, as a result, **reducing healthcare expenditure** for chronic respiratory diseases. This need has become even more central following the coronavirus pandemic.

Reduction of GHG Emissions

In order to calculate the GHG emissions of an e-vehicle, one needs to **consider the life cycle** (production, use and disposal). In general, the production of an e-vehicle needs more energy (+70%)⁸⁶. Conversely, **e-batteries are more efficient** than internal combustion engines as they are able to convert energy in mileage (with a proportion of 80:25). **The amount of GHG emitted** for the production, use and disposal of an e-vehicle **depends mostly on the type of energy source used**: a higher share of renewables over fossil fuel generates more environmental benefits.

Reduction of acoustic pollution

This benefit is more evident in large urban centers, where vehicles travel at a lower speed and traffic is more congested. It is important to decrease acoustic pollution in order to **protect the health** of citizens, in particular to reduce the risk of onset of sleep disorders, cardiovascular diseases, hypertension, stress, increase in aggressive behaviors and mood swings.

85. As regards hybrid vehicles, if 100% e-battery operated, they generate no exhaust emissions; if 100% i.c. engine-operated, their emissions are higher compared to a traditional vehicle because the vehicle is heavier due to the presence of the battery. Hence, the level of emissions of each vehicle depends on the proportion of use of the two systems.

86. The requirement mainly depends on finding the raw materials for components and on the making of the battery.

PUBLIC AND PRIVATE INVESTMENTS FOR ELECTRIFYING THE CAR SECTOR

In view of the post-COVID-19 economic recovery, national governments have boosted **public investments** and **stimuli in the form of incentives to buy** e-vehicles, with the twofold goal of giving momentum to the car sector and achieving environmental and climate-related targets. Italy as well has increased the incentives already introduced under the Budget Law of 2019 for the purchase of new low-emission cars. Moreover, the Legislative Decree approved in August 2020 provides for the disbursement of funds for recharge infrastructures.

A major contribution comes from the **car industry**: several analyses confirm that the companies' investment plans will not undergo significant changes due to the pandemic; BNEF estimated that in 2022 as many as 500 e-vehicle models will be on the market (BNEF 2020).

Car markers' appetite is influenced, amongst other things, also by the action of investors who are keen on environmental and social sustainability themes, which, in many cases, engage with investee companies (**engagement**) in order to familiarize with their orientations, goals and commitments in the transition to e-mobility.

POTENTIAL DEVELOPMENT OF E-VEHICLES IN VIEW OF SUSTAINABILITY

The e-vehicles life cycle is going through a fast and vast process of evolution and technological innovation, which is also significant in view of **mitigating climate change**. Set out below are a number of aspects that are of interest for sustainable investors:

- **transparency and responsible management of supply chains**, especially in relation to finding raw materials – such as cobalt, lithium and nickel – that are mostly extracted in areas of Africa and South America where violations of human rights and child labor have been documented;
- **energy efficiency and decarbonization of production processes**, by boosting procurement of electricity from renewable sources and supporting the development of less-energy-intensive technical solutions;
- **longer-lasting and higher-performance batteries**, which can favor a more



widespread use of e-vehicles for private and corporate use (as batteries account for 30% of the average cost of a car), and enable a more efficient management of resources;

- **adoption of circular solutions for the disposal of exhaust batteries**, by boosting recycling and energy storage to serve infrastructures, private dwellings, large residential or commercial real estate and industrial plants;
- **widespread network of recharging stations**, that are complex and expensive to install and which might be the object of public-private partnerships to reduce investment-related risks;
- **reindustrialization and reskilling of the car industry employees**, for example through the **Just Transition Mechanism** (see p. 140) and the **Solvency Support Instrument**, conceived as part of Next Generation EU to finance the companies that suffered significant damage because of the pandemic and that have difficulties accessing capital markets; in addition, the **European taxonomy** can guide automotive companies in the design of green transition plans in line with minimum requirements for social protection.

Air transport

In the European Union, air transport accounts for 3% of GHG emissions and 14% of transport-related emissions. Passengers increased by 6.2% per year globally over the last decade; despite the pandemic has caused a sudden decline in traffic and significant economic damage to industry players, the IEA expects global demand to continue to grow in the long term (IEA 2020a). **This sector is carbon intensive**, with carbon intensity being an indicator of the amount of carbon emissions produced per kilometer by a passenger: flying produces 285g of CO₂ per kilometer per passenger; a car produces 42 (Il Sole 24 Ore 2019).

Reducing the environmental impact of air transport is therefore crucial for the recovery of the European economy and to mitigate climate change. A first move was to **compensate for GHG emissions**. This practice, which consists in capturing CO₂ from the atmosphere, for example through forestation, has been adopted by many airlines including for marketing purposes. However, it is rather controversial and often criticized: in many cases companies are not sufficiently transparent on the efficacy and monitoring of the projects undertaken. Furthermore, many point out that **this solution cannot replace the commitment to reduce emissions** (see box “CO₂ compensation and forests: the importance of a consistent and structured approach”, p. 104).

Areas of investment for decarbonizing the air transport sector

The European Union is working on other initiatives focusing on fuels. Air transport depends almost entirely on kerosene, a highly polluting fossil fuel. The industry is considering the use of **alternative fuels**, still the performance of e-batteries and other non-fossil fuels, for the time being, falls short of the energy intensity required for aircraft operation.

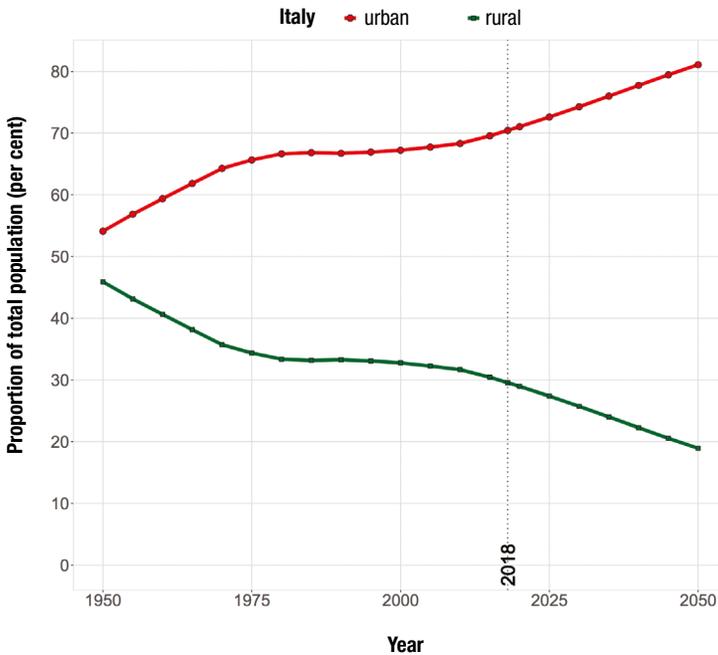
In the mid-term, the sector is working to **improve the energy efficiency of aircraft and engines** as well as to **reduce the emissions generated by fuel production**.

The situation is further complicated by the fact that this is **a competitive market with very narrow operating margins**: for aircraft manufacturers and airlines it is risky to appropriate the sizable investments that are necessary to introduce innovations. In this regard, the **public finance** provided to alleviate the economic impacts and job cuts caused by the pandemic can be an important opportunity. For example, out of a €15 billion package, the French government appropriated €1.5 billion to R&D activities to reduce by 30% the emissions of the Airbus A320 aircraft (one of the most commonly used for commercial flights) by the beginning of next decade. Besides, by 2035 the goal of Airbus – a European company based in France – is to launch a zero-emission aircraft, probably hydrogen-based. Besides these measures, the French government requested that Air France dramatically restricts domestic flights for which a less than 2.5 hours railway ride is an option (Fabre 2020). Still, several NGOs deemed this measure to be insufficient, highlighting that, in order to achieve climate mitigation targets, it is also essential to reduce long-haul flights.

5.3. SUSTAINABLE CITIES AND CONSTRUCTION

By 2050, over two thirds of the world population will be living in cities. Urbanization will increase from 55% to 68%, driven mainly by the dynamics of countries such as India, China and Nigeria: it is estimated that Delhi will become the most densely populated city in the world starting from 2028. In Europe, already today two thirds of the population (approximately 500 million people) live in cities. As regards Italy, it is expected that in 2050 over 80% of people will reside in urban areas (UN DESA 2018).

FIGURE 20. Percentage of inhabitants in urban and rural areas in Italy



Source: UN DESA 2018

Unless adequately governed, **this transformation can entail adverse repercussions on the environment and society**. For example, the preservation of green areas within cities is a practical challenge in view of protecting the population and the most fragile individuals, given the beneficial impacts in terms of CO₂ absorption, improvement of air quality, reduction of heat waves and acoustic pollution.

Turns out, the strategic challenge is the design of the cities of the future. These amount to a technological innovation and sustainable development lab to ensure better living conditions for the population: use and integration of digital technologies, urban green areas, energy monitoring and saving, soft and shared mobility and the circular economy are but some of the themes that can radically change the face of the urban metropolitan landscape, bringing it closer to the notion of **smart city**. This expression refers to six interlocked dimensions: people, governance, economy, living, transport and the environment.

The notion of **smart people** entails grassroots participation and discussions between citizens and local authorities, thanks to which people can contribute to and co-design local policies. **Smart governance** entails transparent governance models centered on relational and shared assets. **Smart economy** refers to the ability to fully tap the opportunities offered by the ICT by integrating them to the services offered to citizens and enterprises. The notion of **smart living** refers to the benefit for living that derives from infrastructural innovations, including, broadly speaking, services for citizens and enterprises that range from remote home control to automatic lighting and heating systems. **Smart mobility** is one of the key dimensions underlying the notion of smart city and is one of the clearest examples of actions in the phase following after the health crisis (see box below).

Finally, from the environmental point of view, it is necessary for **sustainability** to be **the red thread of the transition to this new paradigm of smart cities**, that should be based on transformative processes which minimize impacts and on a model of circular economy centered on energy efficiency and reuse.



URBAN MOBILITY

Over the last few years, cities have been at the center of a major evolution driven by two factors: **technological and digital innovation** – of both means of transport and mobility infrastructures – and **changes in the needs and habits** of citizens. **Smart mobility** refers to a new way of conceiving and organizing mobility that has, essentially, four distinctive features: **sharing, connectivity, electrification and automation**. The goals are: to improve the quality and effectiveness of mobility; to increase the cost-effectiveness of transport for users; to increase the efficiency of mobility service providers and to reduce the impact on the environment.

Financial players as well are drawn to the theme of smart mobility, which many consider to

be a **megatrend**, that is to say a phenomenon that is capable of bringing about structural changes in economic and financial services as well as in politics and society.

Mobility as a Service

The notion of Mobility as a Service is a new way of conceiving mobility: it is a shift away from personally-owned modes of transportation and towards planning a route by choosing the combination of modes that is most suitable to one's needs.

GREEN PUBLIC PROCUREMENT FOR SMART MOBILITY

Green Public Procurement (GPP) is a functional instrument for implementing smart mobility initiatives. It is the process whereby Public Administrations purchase low-environmental-impact goods and services. In Italy since 2015 it is mandatory to join GPP for a number of services, including mobility.

Mobility as a service is based on **digital technologies** which enable interconnection of a variety of services and operations: for example, traffic management infrastructures (such as smart traffic lights), apps and software platforms with which users can select the route, choose and book multiple modes, make electronic payments and monitor the status of their journey. As such, **Internet connectivity and data**

availability become more important – and the same holds true for the companies that collect, manage and analyze data; this wealth of information can be used to monitor service quality and environmental impacts.

Technological innovation and connectivity have a broad potential, including relating to **automation**, which can turn out to be particularly effective for road goods transport in combination with the electrification of means of transport. Here again, the development process will depend on the availability of **artificial intelligence solutions** to guarantee adequate levels of security.

The notion of smart mobility also entails a stepwise shift away from personally-owned modes, especially cars, towards car **sharing** or other **micro-mobility** solutions such as bike- or scooter-sharing.

Milan is the reference city in Italy (with a fleet of 2,900 cars, 1 million registered users and 6.15 million rentals in 2019) and tops European rankings of car sharing (ANIASA 2019).

ENERGY EFFICIENCY IN THE CONSTRUCTION INDUSTRY

According to Eurostat (2019), buildings account for 40% of overall energy consumption and 36% of GHG emissions, mainly from construction, use, renovation and demolition.

Today, approximately 75% of European real estate has a poor energy efficiency performance. Renovation of existing buildings might reduce EU energy consumption by 5-6% and CO₂ emissions by approximately 5%. In 2018, energy efficiency investments attained \$240 billion globally in the construction, transport and industrial sectors but way behind required levels (IEA 2019a). Moreover, in 2020 invested volumes are expected to decline by 20% due to the COVID-19 pandemic (IEA 2020c).

For Europe, the EU Commission (2019a) foresees that **in order to achieve 2030 climate targets, €260 billion per year in additional investments will be needed**, which will have to focus first on real estate energy efficiency – to which three-quarters of the investments will have to be appropriated according to the estimates of the HLEG Final Report (2018). As such, public financial resources should be used as a driver of transformative change, maximizing the impact of private investments. The Next Generation EU plan recently approved (see p. 56) will be a substantial contributor to this target, which, in order to be achieved, needs unprecedented collaboration to align public and private investments with sustainable development targets.

Public authorities, in particular municipalities and local authorities, are vital for sustainable development as they have a role not only in the renovation of public and private buildings but also in areas such as sustainable mobility, circular economy, social infrastructures and countering soil consumption⁸⁷.

87. On the importance of introducing circular processes in the construction industry, see box "Circularity in the construction industry", p. 133.

5.4. DIGITAL TECHNOLOGIES

The importance of the digital sector has become particularly clear over the last few months; besides, it cuts across many areas, from research (including processing models linked to risks and climate scenarios) to social inclusion. As a matter of fact, optimal fruition of public services as well as participation in the labor market increasingly depend upon connection to digital services (Capgemini 2020). For the post-COVID-19 economic recovery ItaSIF recommends, amongst other things, to encourage digital innovation projects that are environmentally sustainable and aimed to bridge the digital divide (FFS 2020a).

According to the 2019 Digital Economy and Society Index, **Italy is still a laggard in Europe in terms of digitalization**. This situation has entailed social and economic issues during lockdown when, for example, many students had a hard time accessing distance learning⁸⁸.

Therefore, policies and investments for strengthening technological infrastructures are increasingly urgent and important. Still, in this sector it is essential to identify inclusive, low-environmental impact solutions. **The pollution caused by the Internet and electronic devices is, in fact, increasing**. In 2007 the ICT sector (i.e., all the devices and technologies used for exchanging digital information, such as the Internet, the e-mail and smartphones) accounted for 1% of global CO₂ emissions: this proportion currently stands at 2% (European Commission 2020a). A study by the McMaster University (Belkhir and Elmeligi 2018) estimated that by 2040 the ICT sector might account for 14% of total emissions.

What makes the digital so polluting? In the first place, production processes: the devices that we use every day such as computers, smartphones and tablets contain materials, so-called “rare earths”, that need high-climate-changing-emissions extraction activities. Furthermore, **technological devices are complex to dispose of** due to both their components, made from a variety of different materials (copper, mercury, lead, aluminum and gold among others) and for the possible leakage of hazardous substances in case such devices are opened or damaged. In addition, we have become accustomed to using these technological devices and replace them increasingly frequently. Smartphones, in particular, entail the most severe consequences for the environment as they are energy-intensive because they require to be charged more frequently than previous mobile phone models, their life cycle is shorter and are recycled only to a limited extent.

The Internet remains the main source of pollution: if it were a State, it would rank sixth among energy consumers worldwide; every activity carried

88. According to the May 2020 Censis report, as little as 11.2% of school executives said that, at the time of the survey, all students were involved in distance learning; this is in line with the situation in Italy as a whole, with slight differences among geographies, save in North-Western areas where this rate declines to 9.5%.

out through the Internet implies complex data processing by servers and data centers which, in turn, are energy-intensive; plus, the devices used need energy to be recharged (Fabre 2018). The environmental footprint of the ICT sector is influenced by its **high energy consumption**, estimated at 5-9% of worldwide electricity consumption – possibly up to 20% by 2030 (Enerdata 2018). Having said that, though, one should also bear in mind the complexity and uncertainty of processing hard data on the pollution generated by the digital technologies sector, which is subject to ongoing innovation that can significantly modify the parameters used. Which is why, estimates such as those mentioned above are not universally agreed upon. According to the study by Ericsson published in February 2020, despite the exponential growth of the ICT sector in recent years, its current contribution in terms of global CO₂ emissions has remained stable and in any case within 1.4% (Ericsson 2020).

Having said that, though, without underestimating adverse environmental impacts, one should consider the positive contribution of ICT to sustainability. In fact, the **digitalization of services** enables us to save paper, reduce postal shipments and boost the efficiency and speed of processes, as is the case with the Public Administration and some financial transactions (e.g., online banking). Besides, it is possible to curb and compensate adverse impacts: for example, the Ecosia search engine uses some of the proceeds from users' searches to finance reforestation projects; Google has developed the carbon-intelligent computing platform to curb the energy impact of its data centers so as to use clean energy only (Radovanovic 2020). High-tech juggernauts the likes of Facebook and Apple are on the same path. In Italy, the premises and data centers of Aruba (the leading Italian provider of data center IT data, web hosting, e-mail, certified e-mail and domain registration services) are 100% based on renewable energy sources⁸⁹.

The **commitment of the European Union towards digital transformation**, set against this background, aims to achieve three key goals:

- technology to serve people;
- fair and competitive economy;
- open, democratic and sustainable society.

These goals are directly linked to achieving the European Green Deal: the European Commission (2020a) recently declared that “digital solutions can favor the circular economy, support decarbonization in all sectors and reduce the environmental and social footprint of the products put in the EU market”, thus helping achieve **the goal of climate neutrality**. This declaration of intents resulted in a list of specific goals the “**Digital Strategy of the European Union**”, presented in February 2020 and comprised of the following actions:

89. For more information: <https://bit.ly/3pdXSFC>

- launch a new EU industrial strategy to support its green and digital transformation⁹⁰;
- improve the EU's ability to forecast and manage environmental catastrophes, including thanks to the development of a digital model of the Earth (Destination Earth)⁹¹;
- support the circular economy, including through the introduction of new “product passports” to provide information on their origin, composition, end-of-life management and recycling;
- start an initiative on circular electronic devices to improve regulations to extend the life cycle of electronic devices;
- aim for zero-impact data centers and ICT infrastructures by 2030, by promoting their energy efficiency;
- profit from artificial intelligence, 5G, cloud and edge computing as well as Internet of Things;
- support automated and interconnected transport by developing smart mobility systems;
- increase the sustainability of public procurement, ensuring enforcement of EU rules on green public procurement.

But just how can those **investors** who are sensitive to environmental and social themes seize the opportunities linked to the digital sector while promoting greater sustainability? They can do so, for example, by **financing the most innovative green applications** or starting to **engage with investee companies**. In terms of

social and governance sustainability, responsible investors have already taken actions on the practices of ICT companies: an example is the 2018 Facebook–Cambridge Analytica scandal, that exposed privacy issues and concerns for the use of data to influence the political choices of the electorate. This event triggered a reaction from financial players committed to sustainability and impacted the management of investments and ESG ratings (FFS 2018).

THE INDUSTRY 4.0 PLAN

The Industry 4.0 (today Enterprise 4.0) Plan focuses on innovation and digitalization in Italy; however, it does not propose a consistent view on sustainability and, as a result, in some cases, it supports technological changes in linear systems, without encouraging the use of technology as an enabler of the transition towards a low-emission, circular economy.

90. In its press release of March 10, 2020, the European Commission informed that it has presented a new strategy to help European industry lead the two-fold transition to climate neutrality and towards digital leadership with a view to boosting Europe's competitiveness and its strategic autonomy: <https://bit.ly/38roVr2>

91. For more information: <https://bit.ly/2Fw64zh>

The need to accelerate the digital transition as the driver for sustainable development was recently highlighted also by the Italian Alliance for Sustainable Development (Alleanza Italiana per lo Sviluppo Sostenibile (ASviS 2020)). In its May 2020 report ASviS maintains first of all the importance of **digitalization to support welfare and smart working**, with beneficial effects on mobility and, as a result, also on climate and in terms of better air quality. In addition, it also dwells on the opportunities offered by digital innovation for sectors like agri-food, healthcare and social inclusion.

The ICT sector is among those included in the **taxonomy of environmentally-sustainable economic activities** (see p. 37): in particular, digitalization is considered an enabler for the reduction of the GHG emissions of other sectors or activities (TEG 2020b).

5.5. THE CIRCULAR ECONOMY

Elisabetta Bottazzoli, Sustainability and Circular Economy Expert

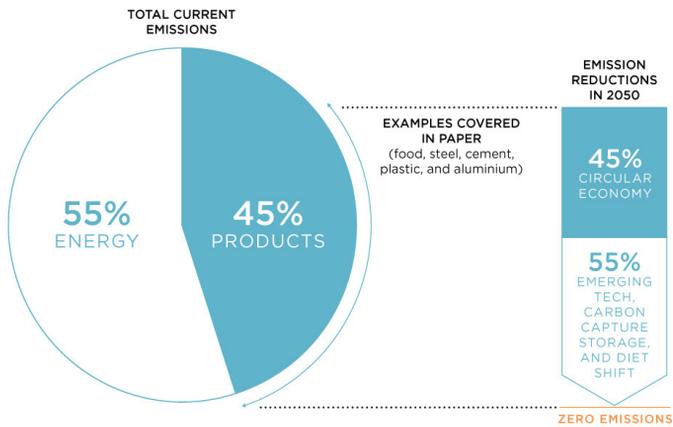
The global response to climate change is, at present, an unfinished picture, a blurred photograph. We need to rush and finish off this photograph so it is sharp. This, essentially, is the call to action of the Ellen MacArthur Foundation (2019) in its report *Completing the picture. How the circular economy tackles climate change*, aimed to investigate **the link between global warming and the linear economy**, highlighting such strategies as a circular economic model would enable to adopt to counter climate change⁹².

The World Economic Forum of Davos confirmed that this avenue has yet to be resolutely taken: it would appear that at present the share of the circular economy worldwide is as little as 9% (Van Houten and Ishii 2020). Also the latest *Circularity Gap Report* (published in 2020 based on 2017 data) pointed out a negative trend of circularity in our planet, though acknowledging that some States are taking significant steps ahead, especially in Europe where 13 countries have put in place policies aimed to accelerate transition to the circular economy⁹³.

92. As defined by the Ellen MacArthur Foundation, circular economy is a generic term to define an economy conceived to be capable of autonomous self-regeneration. In this model, material flows belong to either biological cycles (which feed back into the atmosphere) or technical cycles (with products being recovered and restored with no feedback into the biosphere). This economic system is designed for reusing materials in subsequent productive cycles, thus minimizing waste and which, in all phases, from design, to production, consumption and even end-of-life, is capable of curbing materials and energy inputs and minimizing waste and losses, by focusing on the prevention of negative environmental externalities on adding value to society and the territory.

93. Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Poland, Portugal, Slovenia, Spain and The Netherlands.

FIGURE 21. Circular economy and GHG emissions reduction



Underpinned by a transition towards renewable energy, a circular economy can help tackle the overlooked 45% of emissions by transforming the way goods are made and used.

Source: Ellen MacArthur Foundation 2019

Transitioning to the circular economy in order to reduce GHG emissions

Circular strategies enable to achieve many of the 17 UN SDGs, including #7 on energy, #8 on economic growth, #11 on sustainable cities, #12 on sustainable consumption and production, #14 on oceans and #15 on life on Earth. Even more importantly, the circular economy enables to speed up achievement of #13 on climate change.

As a matter of fact, the way in which the current extraction-production system interacts with natural resources and raw materials accounts for most energy consumption and related GHG emissions (extraction, processing, transport, use and waste of materials). Transitioning to a circular production-consumption model, that is to say to a regenerative economy that is capable of improving and optimizing productive processes, enables to:

- **save commodities and materials;**
- **reduce energy consumption and emissions** all the way across the procurement chains of resources and materials;
- **maintain and add to the value of the products' embedded energy;**
- **increase the carbon sequestration potential** through the regeneration of natural systems.

Many authoritative sources agree that a more circular world economy can be key to keep global temperature increases under 1.5°C. In order for the

transition from linear to circular economy to be effective, it has to apply these three principles⁹⁴:

- 1. design out waste and pollution**, so that goods and services are designed and made to be circular, thus eliminating waste since the design phase and providing for materials replacement;
- 2. keep products and materials in use**, by encouraging reuse of finished products and/or their components and “recirculation” by feeding back materials into the production system;
- 3. regenerate natural systems**, thanks to regenerative farming which ensures land protection and is beneficial for the environment.

These principles have a profound impact on all such production sectors as are considered to be responsible for most GHG emissions. For example, steel, plastics, cement and aluminum require priority action in the **secondary (industrial) sector**. In a linear economy, these compartments imply the extraction of raw materials and considerable energy consumption due to the high temperatures of production processes and products’ end-of-life management. Now then, an upstream and downstream circular approach to processes and products could reduce emissions by 40% by 2050, according to the estimates of the Ellen MacArthur Foundation.

The primary sector, also known as AFOLU (Agriculture, Forest and other Land Uses)⁹⁵ can significantly help fight climate change through its ability to sequester carbon in the soil, minimize emissions along the supply chain and regenerate natural ecosystems. Targeted action can be taken in the value chain, by extending useful life and marketability (shelf life) of products, a proper end-of-life management (composting and anaerobic digestion), models for sharing and supplying new services, as well as more digitalization and application of innovative technologies.

For the primary and secondary sector alike, **the circular model of production-consumption enables to decouple economic growth and prosperity from the exploitation of resources that by now have become scarce**, operating within the limits of our planet and taking account of the “resource constraint”⁹⁶. Supported by a transition to renewable energies and the use of renewable resources/materials, the circular approach is characterized by the active and **collaborative participation** of enterprises, countries, cities and local communities. Moreover, it aims to extend the life cycle of products, reduce the use of materials and make

94. These principles were identified by the Ellen MacArthur Foundation: 1) *design out waste and pollution* (design for circularity; eliminating waste; substituting materials); 2) *keep products and materials in use* (reusing products and components; recirculating materials); 3) *regenerate natural systems* (regenerate farming).

95. Agriculture, Forestry and Other Land Use or AFOLU as defined by the IPPC (Integrated Pollution Prevention Control).

96. “Resource constraints”, European Investment Bank. The Earth is a closed system, where demand for resources is constantly increasing. It is necessary to decouple prosperity and the use of scarce natural resources and effectively manage scarce materials flows, thus ensuring prosperity by operating within the limits of our finite planet.

products and components broadly reusable, provide easy disassembly of parts for repair and replacement as well as new service models such as goods support and sharing.

FIGURE 22. Circular economy measures in the agri-food supply chain

Circular value chain	Lifetime extension/ shelf life extension	Recovery & reuse	Sharing and service models	Digital platform
<ul style="list-style-type: none"> Optimized use of fertilizers and water in agriculture by using smart sensors Prevent waste in the supply chain and at consumer level Energy recovery from waste (biogas) Energy efficiency improvements in the supply chain Shift from meat and milk towards plant-based alternatives Shift from beef to alternative meat like chicken and insects Sell food products that deviate in shape or otherwise, without compromising minimum food conditions 	<ul style="list-style-type: none"> The shelf life of food can be extended by advanced packaging using different materials and different portion sizes 	<ul style="list-style-type: none"> Anaerobic digestion of vegetable and fruit waste Increase recycling of packaging materials like plastic, metals and cartons by advancing recycling systems 	<ul style="list-style-type: none"> Sharing food products and meals via smart communication channels Optimal use of food residues, e.g. via recipes or supermarket policy 	<ul style="list-style-type: none"> Early warning of approaching expiry date of food Smart refrigerators

Source: WBCSD 2017

Resources or Waste?

In Europe, over the last few years, in the area of waste management, an innovative materials policy has been developed which aims to design and organize cycles: waste becomes materials flows and products are designed to be made from recycled materials and be themselves recyclable.

In order to encourage the production of recycled products, European Directive 2008/98/CE introduced the notion of **End of Waste**⁹⁷ in order to set technical and environmental targets capable of establishing when, following specified recovery operations, waste ceases to be waste and becomes a product (which, as such, is no longer subject to the regulations that govern waste).

By focusing on **maximizing the products' inherent (economic and energy) value** and by closing cycles (by feeding them back into such products or materials as compose them in the market), the economy becomes increasingly

97. ISPRA specified that Article 6, paragraph 1, of EC Directive 2008/98 (Framework Directive on waste) provides that waste ceases to be waste when it is recovered (including recycled) and complies with specific criteria: <https://www.isprambiente.gov.it/en>

circular and, as highlighted above, so resilient that it mitigates the effects of climate change.

In order for its strategy to be effective, Europe should take resolute action to solve some criticalities, including the fact that waste exports are still a significant disposal channel that is used for the amounts that the European recovery system is unable to absorb and that commodities markets are subject to recurrent fluctuations, with a rather marked price volatility, especially in recent years due to both the current economic situation and geopolitical factors, and specific industrial and commercial dynamics of individual sectors.

Italy: strengths and weaknesses

The waste sector is an integral part of the manufacturing industry as it is a source of secondary raw materials and is strategic for a processing economy such as that of Italy. Indeed, Italy is a large exporter of manufacturing goods and an equally large importer of virgin raw materials and semi-finished products; besides, it has historically been quite good at reusing secondary raw materials (this being an ability that Italy originally developed to reduce imports).

Italy is one of the four European States with the highest recycling rates for packaging from urban waste collection; overall it has already attained the targets set in the European Package for Circular Economy by 2030 (only plastic packaging falls short of the 2025 targets)⁹⁸.

Our country is **a best practice also in the processing of organic waste**, which results in the production of good quality compost as well as biogas and biofuels. As a matter of fact, the European Package for Circular Economy provides that by 2023 biodegradable waste must be segregated and sent for industrial composting or anaerobic digestion, whereas from 2027 only organic waste from waste segregation can be reckoned in relation to recycling targets (as has long

THE EUROPEAN PACKAGE FOR CIRCULAR ECONOMY

The contribution of the circular production-consumption model towards achieving climate targets has been confirmed by the recent European Package for Circular Economy at the heart of which lies action based on four pillars relating to waste flows, with ambitious recycling targets⁹⁸.

In addition, in March 2020 the European Commission adopted a new Circular Economy Action Plan, which is an integral part of the EU Green Deal for sustainable growth in Europe. With measures for the entire life cycle of products, the Plan focuses on resource-intensive sectors with a high circularity potential: electronics and ICT; packaging; plastics; textiles and food.

98. At present, in Italy, legislative decree 116/2020 has transposed EU Directive 2018/851 which modifies EU Directive 2008/98/CE on waste and EU Directive 2018/852 which modifies EU Directive 1994/62/CE on packaging and packaging waste.

99. For in-depth information on the theme of packaging recycling and recovery: FFS and CONAI 2018; FFS and COMIECO 2020.

been the case in Italy).

In Italy, the circular economy strategy based on the «**recycling**» of materials can be said to be well-established and features excellent achievements: indeed, Italy is among the top five European economies in the ranking of overall circularity index; tops the ranking of the waste management index, ranks second in the performance index relating to the use of secondary raw materials (CEN and ENEA 2020)¹⁰⁰.

Still, in Italy, the waste management system is penalized by the fact that it is still **perceived as an “urban hygiene” service rather than a source for materials** to be re-marketed thanks to an industrial system that is integrated in the national entrepreneurial system. Hence its low reputational value which, alongside other political and social factors, hampers the adoption of strategies (aimed to minimize waste and pollution) for the design and conservation of products and materials (to extend use as much as possible)¹⁰¹. If these criticalities were fixed, Italy would be a best practice also in terms of competitiveness in the circular economy.¹⁰²

Effects of the pandemic on integrated waste management

The weaknesses of the system have become even more evident during the crisis caused by the Coronavirus. In a matter of a few weeks, due to the subsequent restrictions we have seen (Utilitalia 2019):

- a sudden and sharp decline in the production of special manufacturing waste;
- an increase in household waste and in particular organic waste;
- a sharp decline in the share of like waste from commerce, tourism and the service sector as part of urban waste;
- tourism-related activities grinding to an almost complete halt (with these activities being among the main contributors of waste in some areas);
- an increase of healthcare waste at risk for infection;
- a lesser amount of green structuring waste for composting plants as maintenance of public and private green areas had in turn come to a halt.

All of this also caused **strong market fluctuations** and **difficulties for the related facilities** given that the latter, for optimal operation, need stable incoming flows (quantity- and quality-wise).

The economic crisis that set in on the back of the pandemic can in turn impact the transition to the circular economy and trigger processes that risk reducing the quantities of “resource-waste” to be recycled and increase, conversely, the

100. The following indicators have been considered for assessing performance in terms of waste management: urban waste production; all-waste production; urban waste recycling; all-waste recycling; landfill disposal. The performance in terms of use of secondary raw materials is assessed based on the results achieved in terms of rate of circular use of materials (CEN and ENEA 2020).

101. “Design out waste and pollution” and “keep products and materials in use” (Ellen MacArthur Foundation).

102. The following are competitiveness indicators considered for assessing performance in terms of circular economy: number of patents; eco-innovation inputs; eco-innovation outputs; eco-innovation index; employment; added value; investments (CEN and ENEA 2020).

“waste-waste” flows intended to be used for energy recovery¹⁰³ or to be disposed of in the landfill (for example because of the strong recovery in the consumption of single-use, often non-recyclable, products for reasons of safety and infection prevention).

This trend can be countered thanks to the circular production-consumption model: still, the latter needs to be supported by strong policies and targeted investments, both of which are necessary to develop a new technological, infrastructural and industrial capacity.

The capacity to treat the fractions from waste segregation to be “re-circled” as materials is linked to all those productive activities that are its natural outlet: from papermills, to panel factories, foundries, glassmaking mills and so forth. However, in order to strengthen this circular link, an **adequate network of facilities is needed in terms of size, reach and ability to be equipped with state-of-the-art technologies and investments in R&D**. This would ensure a reduction of:

1. the uncertainty in the procurement of materials and goods, while enhancing the ability to counter price volatility thanks to resilience and innovative solutions to tackle scarcity of resources;
2. production costs thanks to an eco-design that encourages reuse, disassembly, regeneration and recycling, thus maintaining the inherent value of goods/materials (for example energy);
3. waste management costs, thus generating higher margins given the optimization in the use of resources, reverse logistics¹⁰⁴ and industrial symbiosis¹⁰⁵.

Finally, the difficulties Italy is facing in establishing infrastructures for - and modernizing - facilities are not in terms of finding economic resources but rather of **political and regulatory instability that makes it difficult to plan sustainable investments**.

103. Directive 2008/98/EC sets forth the waste management hierarchy: prevention, preparation for reuse, recycling, recovery (for example, energy recovery) and disposal. The R1 formula defined in a note to Annex II of the Directive was introduced for the purpose of distinguishing incineration of urban waste classifiable as energy recovery (R1) from incineration of urban waste classifiable as disposal (D10): it qualifies energy recovery when urban waste incineration significantly contributes to the production of electricity and thermal energy. The reference regulatory framework is legislative decree 152/2006 as amended and supplemented thereafter.

104. The European Working Group (Revlog) defines reverse logistics as the “process of planning, implementing and monitoring the flows of raw materials, semi-finished products and finished products from production, to distribution and from the end customer to the point of recovery or to the point of collection and distribution “: www.rev-log.com

105. By “industrial symbiosis” it is meant the interaction among different industrial plants (as clustered in districts or set apart, as the case may be, depending on the operation) used to maximize the reuse of the resources typically considered as waste and optimize the knowledge and skills of companies. It involves industries that have traditionally been segregated and does so with an integrated approach aimed to promote competitive advantages through the exchange of materials, energy, water and byproducts. Among the key aspects that enable industrial symbiosis are collaboration among companies and the possible synergies available in a given geographic and economic area.

Measuring circularity helps monitor the contribution towards countering climate change

In order to establish a Circular Economy, measurement systems are needed which are capable of highlighting any criticality and enable clear communication of the benefits obtained and/or that can be obtained, above all with respect to the emission of climate-changing gases and other pollutants. Measuring circularity amounts to **quantifying the resources used during the entire life cycle of a process, service or product**: Life Cycle Assessment is an analytical and systematic methodology that determines the environmental footprint of a product from the extraction of raw materials, through to production, distribution, use and final disposal and shows the environmental impact of the entire life cycle. One of the impact categories measured is the increase in greenhouse gas emissions due to human activities (*Global Warming Potential - 100 years*), as measured based on the amount of CO₂eq emitted in the atmosphere as a result of the consumption of energy and materials in the life cycle of the product/service. As it determines energy and environmental burdens, the LCA is the main tool of Life Cycle Thinking, which, in view of circularity, results in the “from cradle to cradle” approach. Having regard to the constituent materials of products, for example, the adoption of this approach and of LCA assessments enables to identify and use such materials as have a better environmental footprint.

Internationally, the LCA methodology is regulated by ISO 14040¹⁰⁶ rules, including ISO 14067 Carbon footprint of product and ISO 14046-1 Carbon footprint of organization. There being no overall view, for now, of how an organization can enhance the entire production cycle, ISO has decided to set up a new technical Committee: ISO/TC 323 “Circular economy” for developing the requirements, reference frameworks, guidelines and support tools relating to the implementation of circular economy projects. At present a number of tools **for measuring the degree of circularity of companies** are available, such as, for example, **Circulytics**, a tool developed by the Ellen MacArthur Foundation and tested by over 30 companies in 2019¹⁰⁷.

Circulytics uses the broadest set of indicators currently available and enables to:

- measure the entire circularity of a company (rather than just the flows of products and materials);
- support the decision-making process and strategic development for the uptake of the circular model;
- highlight strengths and areas of improvement;
- provide transparent disclosure to investors and customers as to results and policies;
- enhance the performance of the circular economy.

106. For more information: <https://bit.ly/3ikeg2O>

107. For more information: <https://bit.ly/33gx3b5>

Another tool is the **Circular Transition Indicators (CTI) Tool**¹⁰⁸, developed thanks to the collaboration between the World Business Council for Sustainable Development and Circular IQ aimed to help companies measure and enhance the circularity performances by identifying priority actions subsequent to assessment and interpretation of results, understanding of risks and opportunities as well as definition of intermediate targets to monitor progress and achievements down the line.

108. For more information: <https://ctitool.com>

THE “VALUE” OF THE ORGANIC WASTE SUPPLY CHAIN

Approximately 48 Mt of organic waste were produced in the European Union in 2018, of which 80% used for composting, 17% for anaerobic digestion and the remaining 3% for combined plants (European Compost Network 2019). The ECN has estimated that treatment of the organic fraction has enabled to produce 129,000 tons per year of renewable nitrogen and 42,000 tons per year of phosphorous, with 3.5 Mt of carbon stored in the soil through approximately 12 Mt per year of compost. Not only that though. Indeed, this sector can generate between 6 and 8 billion m³ of biomethane, which is an advanced biofuel.

In Italy a specific standard is commonly used to define the quality of compost which under Italian regulations is referred to as *ammendante compostato* (compost-based soil improver) and is included among the fertilizers available for consumption (Annex 2 to Legislative Decree 75/2010 as amended and supplemented thereafter): in 2018 2.04 Mt of compost and 312 million Nm³ of biogas, were obtained, equal to an energy production of 664.000 MWh (Centemero and Bottazzoli 2020).

Besides **the production of organic fertilizers generated by the processing of organic waste**, the marketing of new products is also driven by technological innovation and the search for new applications in order to replace fossil resources with renewables. An example of this is **biomethane**, the fuel obtained from the purification of biogas which, following appropriate chemical and physical treatments (purification or upgrading), becomes eligible for the subsequent phase of compression to be fed to the natural gas grid. At present, biomethane is considered to be an advanced fuel if it is derived from the processing of specified matrices, including the organic fraction from waste segregation. Pushed by a scheme of incentives, a new trend surfaced in 2018 that has grown significantly since then: the design of a treatment system whereby the biogas production line is upgraded for the production of biomethane. In 2018 there were six plants with 86 million m³ of biomethane produced, in 2019 the Italian association of composters (Consortio Italiano Compostatori) estimated nine plants with 104 million m³ and foresees at the end of 2020 13 plants with a production capacity of approximately 200 million m³ of biomethane. All of this also benefits those Municipalities that can start virtuous processes through an optimal integrated management of the waste cycle, providing, for example, for the production of biomethane that can be used to fuel the vehicles used for collecting waste or for local public transport¹⁰⁹.

Uncountable benefits derive from the use of biomethane: environmental benefits, from the significant reduction in GHG emissions released into the atmosphere; economic benefits, from captive-consumption and the sale of products in addition to the reduction

109. Further information is available on the website of public transport companies and on www.autobusweb.com

of waste disposal costs; social benefits, from the beneficial impact on local employment, including in terms of skilled jobs required for innovative and technologically advanced plants.

CIRCULARITY IN THE CONSTRUCTION SECTOR

Construction uses several materials derived from waste (e.g., glass, steel, tires), thus reducing the use of non-renewable raw materials; in turn, the construction sector is a source of materials to be reused at the end of the life cycle of buildings. Still, there are broad areas of improvement to make the construction sector more circular and environmentally sustainable: indeed, the European Commission has included construction and demolition among its priority actions and construction and real estate activities are included in the taxonomy of environmentally-sustainable activities (see p. 37).

Traditionally, demolition did not provide for waste selection at source. In recent years, however, a circular practice has become widespread in the construction sector: **selective demolition**. A first indication of this comes from DG GROW of the European Commission (2018) with the publication of a Protocol for construction and demolition waste management (September 2016), as part of the 2020 strategy for the construction sector (European Commission 2012) and of the Communication on the opportunities to improve resource efficiency in the construction sector (European Commission 2014), as well as of the Package on circular economy. By “demolition” or “selective deconstruction” it is meant **demolition through a systematic approach aimed to facilitate components and materials segregation so as to plan disassembling and the related costs as well as to recover components and materials** (to the extent possible intact, undamaged and not contaminated by adjacent materials) so as to maximize their potential reusability and/or recyclability¹¹⁰.

However, in a really circular model, no building should be constructed without thinking upfront how to recover its materials: **the recovery and valorization of all components should originate in the design stage**. For example, in 2010 RAU Architecten, a Dutch

110. The reference practice is UNI/PdR 75:2020; UNI - Ente Italiano di Normazione: www.uni.com



company specializing in sustainable constructions, designed the Turntoo model (Rau and Oberhuber 2019), in which the maker is responsible for the entire life cycle of products (with the latter meeting the needs of consumers and acting as a warehouse of raw materials for the maker, it being in the maker's best interests to recover such raw materials). Thus, buildings are a materials bank and have their own "identity card" to ensure identification and add value.

6.

The importance of the Social factor



Chapter 6 examines climate-change-related social aspects and their importance from a financial viewpoint, in terms of both risks (more inequalities, involuntary migrations, damage to health), and opportunities (in terms of just transition and greater resilience of companies and human societies).

Climate-related social risks

Recently, the literature (IPPR 2019) has highlighted **the interconnection between environmental, social and economic risks**: extreme weather, indeed, can worsen existing crises or cause new ones, thus undermining the stability of economic, social and political systems even more disruptively than during the 2008 economic crisis. For example, drought and floods can damage farming, with long-term consequences throughout the food supply chain: the United Nations have estimated that back in 2018 soil deterioration and the resulting loss of biodiversity impacted the life of 3.2 billion people (IPBES 2018).

Climate change is also responsible for recurrent **criticalities in terms of social justice both locally and internationally**. As a matter of fact, socio-economic impacts are spread unevenly: poorer countries are more stressed and so are the most vulnerable groups within each State. According to Oxfam data (2020), the richest 10% of the global population accounted for 52% of cumulative emissions between 1990 and 2015, against 7% of the poorest 50% that have not increased their emissions during the last 25 years differently from the wealthiest and the middle class. These inequalities apply also to Europe and within individual States (Ivanova and Wood 2020).

Involuntary mass migrations

The World Bank estimates that **140 million** inhabitants of Sub-Saharan Africa, southern Asia and Latin America might become **“climate migrants” by 2050**. These people are forced to move because of increasingly more pressing problems such as water scarcity, desertification, sea level rise and sea storms. Climate migrants would add to the millions of current migrants forced to move, either within their country or abroad, for economic, social, political or other reasons (World Bank 2018).

Between January and June 2019, 10 million domestic migrants were recorded globally, of which 7 million caused by catastrophes such as the Ildai typhoon in southeast Africa, the Fani typhoon in southern Asia, hurricane Dorian in the Caribbeans, floods in Iran, the Philippines and Ethiopia, associated to severe humanitarian crises. **The climate crisis is the main cause of forced domestic migrations**, with an impact that is seven times stronger compared to earthquakes and volcanic eruptions and three times stronger than wars and armed conflicts (Oxfam 2019). Over the last decade, climate-change-related extreme events have increased five times forcing every year over 20 million people to leave their homes. As already highlighted, the impacts of climate change hit mainly the poorest

countries, which account for fewer GHG emissions.

For this reason, the Paris Agreement on climate expressly requires that the special committee set up by the Warsaw Climate Conference in 2013 establishes guidelines for a legal definition of environmental migrants. More recently, the General Assembly of the United Nations approved the *Global Compact for Safe, Orderly and Regular Migration* (2018) which expressly requires governments to introduce plans to prevent climate migrations and support the people hit by the climate crisis.

Responsibilities and compensations

Article 9 of the Paris Agreement (Climate Finance) stipulates that “Developed country Parties shall provide financial resources to assist developing country Parties with respect to both mitigation and adaptation in continuation of their existing obligations under the Convention”¹¹¹. This commitment originates from the notion of “fair share”: a report promoted by over 100 civil society associations indicates that the USA and the EU account for the largest share of historical emissions and as such they must undertake to cover over 54% of climate-change-related adaptation and mitigation costs, by way of compensation. Indeed, over the last 10 years, the countries that are having more difficulties have suffered economic losses equal to 2% of GDP because of the environmental crisis: a percentage that can reach 20% in the hardest hit nations (CSO Equity Review 2019).

Being aware of these aspects, the European Commission has undertaken the ambitious commitment to make Europe the first climate-neutral continent, while ensuring that the transition to this new model of green growth will be just and fair for all citizens. The environmental policies implemented by the EU will have an uneven impact on regions, communities, sectors and workers in Europe and for this reason must be accompanied by social and economic policies to ensure that no one is left behind (see box “Just Transition Mechanism”, p. 140).

The financial impacts of COVID-19 and the importance of the S factor

On the back of the recent health emergency, the just and fair transition will have to factor in the need to improve the capacity to tackle epidemics, in terms of prevention, treatment and assistance. Crises such as the current one, indeed, might become increasingly frequent: **climate changes are associated to an increase in the risk of pathogens spreading** and, in general, entail adverse consequences for human health (see box below and box “Climate and Young Generations”, p. 144). In turn, **health problems will hit the population unevenly**, thus contributing towards increasing inequalities, with considerable economic and financial consequences.

111. Paris Agreement (2015): <https://bit.ly/3nGro5h>

For example, according to the Bank of Italy (2020) the index of unequal household income distribution increased by 2% in Q1 2020, reaching a high since 2009 (equal to 37%). The main causes are **an increase in the number of low-income workers in the sectors that are most exposed to the risk of infection**, for whom work-from-home is less of an option; at the same time, income support has been short-lived but the adverse impact on the income capacity of households is going to be long-lasting. Besides, both economic and **gender- and generation-related inequalities** have worsened. Between March and April 2020, the number of people employed declined by 400.000 hitting particularly hard restaurants, tourism and childcare services. The hardest hit by job loss were women (-2.3% employed women compared to -1.3% employed men) and the young aged 25-34 who today account for a mere 17% of those in employment. In 2008 the employment rate of the young exceeded that of 50-64-year-olds by 23%; in April 2020 the gap declined to -0.3%¹¹².



THE EFFECTS OF CLIMATE CHANGE ON HUMAN HEALTH

24% of diseases in the general population and over 33% of diseases in children aged 5 and under are linked to exposure to **environmental factors** (WHO 2016) including diarrhea, lower respiratory tract infections, malaria and perinatal (i.e. experienced immediately before and after birth) conditions.

Climate change has considerable short- and long-term, direct and indirect consequences on human health. It is estimated that by 2050 **heat waves** will cause over 120,000 deaths per year in the European Union (EEA 2015): high temperatures (often associated to air pollution) can cause respiratory and cardiovascular conditions, especially in children and the elderly. Other climate-change-related phenomena that can cause damage to health are:

- **floods**, which can worsen the contamination of water and farmland as they convey pollutants;
- greater spreading of **viruses and bacteria** because of high temperatures¹¹³;
- appearance of **new pathogens** due to the loss of biodiversity (WWF Italia 2020b).

112. 2020 Istat updates.

113. High temperatures are conducive to large-scale spreading of pathogens, especially as regards zoonosis, that is to say the diseases transmitted from animals to humans. In ecology and epidemiology, spillover is the mechanisms whereby a pathogen passes from a host species to another one. Today one cannot rule out that these phenomena can underlie the spreading of the novel coronavirus SARS-CoV-2 (WWF 2020a).

It should be pointed out that **strong inequalities are associated to an increase in significant financial risks** such as economic stagnation, economic capacity reduction and increase in non-performing loans. Conversely, the integration of ESG criteria, and especially **the S factor**, in capital allocation strategies **enhances the resilience to exogenous crises**. As a matter of fact, there is a growing interest in these themes: 77% of investors believe that corporate human capital management policies are important and are the second most influential criterion in voting following after the fight against climate change (Morrow Sodali 2020). In March 2020, over 300 investors signed a letter replying to an OCSE consultation – on the *OECD/G20 Inclusive Framework on BEPS (2020)*, Action 13 – requesting more fiscal transparency from companies¹¹⁴; that same year in June, 335 investors with an AUM exceeding \$9,500 billion submitted a declaration so that investee companies undertake to be more respectful of human and social rights in times of COVID-19 (ICCR 2020).

Witnessing the importance of social aspects also from the financial point of view (Del Giudice 2018), in recent months **the companies with high ESG ratings recorded lower losses**¹¹⁵ **especially thanks to the “S factor”**: indeed, the pandemic has highlighted the centrality of elements such as safety and the well-being of workers, supply chain management, customer support and protection of their personal data, as these can reduce a company’s exposure to unexpected crises. In a context characterized by isolation and social distancing, the companies that have been able to maintain effective stakeholders’ relations turned out to be more resilient and better prepared to promptly react to the difficulties connected to an exogenous shock such as is COVID-19 (Vigeo Eiris 2020).

114. The fiscal theme correlates strongly with that of inequalities as the decline in public revenues impairs the public spending capacity, damaging in the first place the most vulnerable groups of the population.

115. According to a recent analysis by AXA IM, covering January-March 2020, as regards the equity market, using the MSCI ACWI base index, ESG Leaders stocks outperformed by 16.8% the stocks of ESG Laggards. Looking at the fixed income market, using the Bloomberg Barclays Global Corporate Aggregate Bond as base index, ESG Leaders outperformed ESG Laggards by 5.2%. Besides, in both asset classes, ESG Leaders outperformed their benchmarks.

NN Investment Partners has pointed out that its global and European ESG investment strategies outperformed their benchmarks by 6.5% and 4.1% respectively.

Looking at market volumes, according to a recent study by Morningstar (Silano 2020) the interest of investors in environmental, social and governance aspects has remained stable: with an outflow of €178.2 billion from mutual funds and traditional ETFs, European ESG funding has been the only one to be positive from January to March (+€30.1 billion). Compared to December 2019, the assets managed by European sustainable funds were down 10% (at €621 billion), against a 16% decrease in the global European fund universe.

THE JUST TRANSITION MECHANISM

On the occasion of the launch of the EU Green Deal Investment Plan, on January 14, 2020, the European Commission presented a proposal for setting up a **Just Transition Mechanism**, conceived to provide **financial support to those European regions that are most vulnerable to the adverse socio-economic effects of transitioning to climate neutrality** such as for example the regions that are heavily dependent on fossil fuels for their production systems, economic structures and employment.

According to the proposal made by the Commission, the Mechanism should mobilize **investments worth at least €100 billion between 2021 and 2027**; all investments must be in line with the EU Green Deal.

The Just Transition Mechanism is based on three pillars:

NAME	METHOD OF FINANCING	FORM OF FUNDING
Just Transition Fund	Fed by: <ul style="list-style-type: none">• €7.5 billion fresh resources from the EU budget¹¹⁶;• co-funded by Member States;• commitment of Member States to increase transfers to other funds with social and cohesion goals such as the European Regional Development Fund and the European Social Fund Plus	Provides mainly grants
Scheme dedicated to just transition as part of InvestEU	Mobilizes up to €45 billion worth of investments from InvestEU	Generates private investments
Instrument for public-sector loans, set up at the EIB	Mobilizes investments worth €25-30 billion	Leverages public investments; provides mainly public-sector loans

116. In the communication on Next Generation EU, the European Commission proposed to increase the endowment of the Just Transition Fund to €40 billion. In the text of the Agreement with the Council of the European Union, the amount of Next Generation EU for the Just Transition Fund has been reduced to €0 billion. See: Final Text of the Conclusions Adopted by the Council of the European Union during the Session of July 17-21, 2020), A14, page 5: <https://bit.ly/3pevMKD>

In order to set up the Just Transition Fund, the European Commission proposed regulations (2020c), currently being discussed with the Parliament and the Council, according to the ordinary legislative process of the EU known as the trilogue. According to this proposal, the Just Transition Fund will provide support to Member States, prorated to their economic development and requirement in terms of magnitude of the economic and social challenge.

In order to have access to funds, Member States are required to draw up “**Just Transition Plans**” identifying the regions that require support in order to manage the economic and social consequences of the transition (for example in terms of professional requalification of those employed in the sectors penalized by the transition). The Plans must give details on the transition process and on the type of interventions foreseen. The Plans must be drawn up in line with the National Plans for Energy and Climate and discussed with the European Commission, for approval and granting of the relevant finance. Approval of the Just Transition Plans also gives access to the funds provided for under the other two pillars of the mechanism.

The projects that are eligible for financing under the Just Transition Fund fall in the following areas:

- economic stimuli (for example, investments for establishing new companies);
- social support (for example, professional requalification of workers);
- environmental restructuring (for example, site decontamination).

THE COMMITMENT OF ETICA SGR FOR THE JUST TRANSITION

Aldo Bonati, Corporate Engagement and Networks Manager, Etica Sgr

After the presentation of the Just Transition (JT) to PRI in Person 2018, Etica Sgr signed the “Investor Statement to Support a Just Transition on Climate Change” (2018).

The main commitment undertaken by Etica Sgr is to include themes relating to work and community in its engagement on climate change.

In 2019 Etica Sgr joined an investor JT working group coordinated by the PRI and introduced the topic, posing a number of ad hoc questions relating to the social sphere and to SDG8

(decent work and economic growth)¹¹⁷.

Etica Sgr started by asking investee companies questions on the JT and monitored the answers. The main goals were to:

1. create awareness among companies of the expectations of investors on JT;
2. gather examples of actions taken and good practices to present an example to other companies;
3. fine-tune Etica engagement approach to JT.

Risks and opportunities for investors

Climate change is one of the most urgent themes that investors have to manage. According to the Global Energy Review of IEA (2020b), in 2020 CO₂ will decline by 8% due to the pandemic; the UNEP Emissions Gap Report (2019) maintains that, in order to achieve the Paris target, emissions will have to decline by 7.6% every year until 2030. Hence, radical changes are required in the way companies operate. The main point is that all this should not be done to the detriment of workers' rights, which are already being threatened by the pandemic.

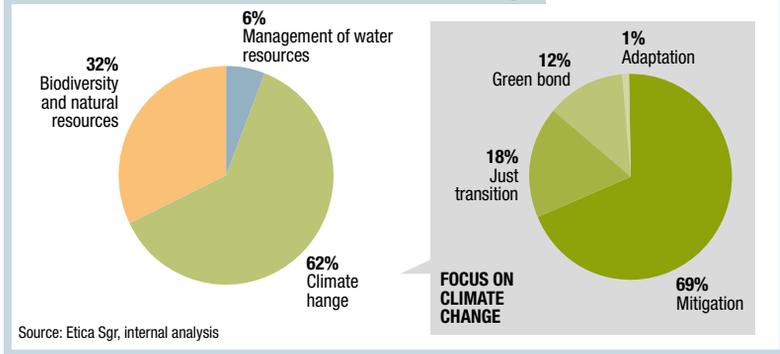
The companies that underestimate the consequences for their employees, suppliers, customers and local communities in transitioning their business model expose their business and their investors to financial risks such as higher stock price volatility. Moreover, **the prompt development of an adaptation strategy helps mitigate the social consequences of the transition and boost the resilience of the business model.**

The activity of Etica Sgr on the Just Transition

In 2019, Etica Sgr engagement entailed approximately 800 questions on ESG themes submitted to over 90 companies across the world. Questions on climate change accounted for 62% of the questions relating to the environment (E) and 35% of all questions. 18% of questions on climate change concerned the JT, which, as such, was the second main environmental engagement theme after mitigation. Questions on the JT were addressed to 17 companies in seven countries (of which seven Italian ones) and a variety of sectors (six in the utilities sector and two in the energy sector).

117. SDG8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all: <https://bit.ly/2JUyTm5>

FIGURE 23. Questions on the environment and climate change



The main outcomes of engagement were: **raising the awareness** of companies on the JT and **verifying** that considerations on the workforce are included in climate-related policies and processes.

Engagement is focused on:

1. potential dismissals due to the transition;
2. strategies to curb the impact on employees, for example through the development of reorganization plans and requalification programs.

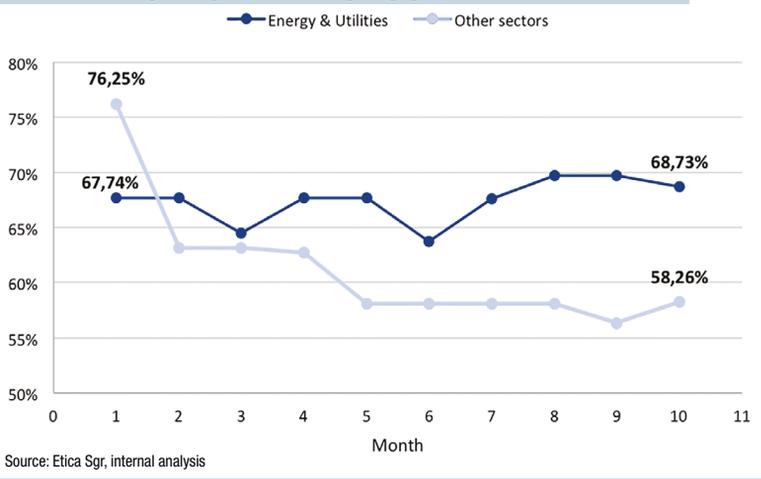
All the 17 companies engaged answered the questions of Etica Sgr. Most of them declared a generic commitment to avoid job loss. Some companies implemented early retirement plans, whereas most of them worked out plans to improve skills so as to enable employees to adapt to the new corporate requirements.

Etica's engagement provides for a quantitative assessment of the companies' answers according to a standardized grid. The chart shows, based on JT-related engagement alone, the aggregate evolution of the answers of the 17 companies based on the moving average of their score.

At the end of 2019, the average score for the Utilities and Energy sectors was 10% higher compared to other sectors. This comes as no surprise, given that these sectors are among those most exposed to transition risks, and accordingly, these companies are better prepared to tackle JT-related themes.

Among the seven Italian companies, only two were aware of the theme, whereas the majority had already developed policies to limit and manage dismissals during company reorganization.

FIGURE 24. Moving average of the Etica Sgr Engagement Score on Just Transition



CLIMATE AND YOUNG GENERATIONS

Chiara Zanetti, Children's rights & innovative finance specialist, UNICEF Italy

Climate Change directly threatens the ability of children and teenagers to survive, grow and prosper. **Extreme weather**¹¹⁸ threatens their life and destroys infrastructures which are crucial for their well-being, such as schools. It is estimated that by 2040 approximately 600 million children and teenagers will live in areas at high risk of **water-related environmental stress**: too much or too little water (UNICEF 2019). **Floods** damage water and sanitation systems, increasing the risk of water contamination. The increasingly longer and frequent periods of **drought** jeopardize harvests and cause an increase in the prices of foodstuffs which, for the most vulnerable categories, means insecurity and nutritional

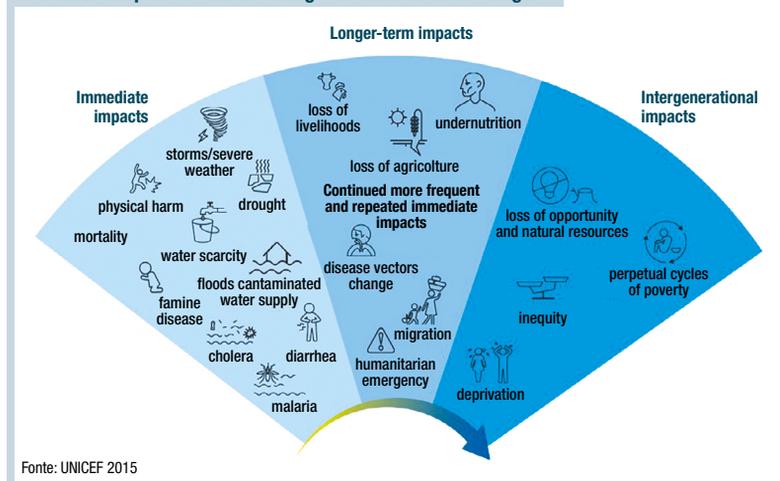
118. Globally, the frequency of natural disasters connected to extreme weather increased approximately 5x over the last 40 years (UNICEF 2015).

deprivations, with a direct impact on the life of children¹¹⁹.

Another crucial element that suffers the consequences of the human activities that are also responsible for climate change is air. Every year, approximately 920,000 children aged 5 and under die of respiratory diseases directly linked to high levels of **air pollution** (UNICEF 2017); whereas approximately 2 billion people under 18 (out of a total of 2.5 billion) live in areas in which air pollution (PM 2.5) exceeds the thresholds set by the World Health Organization and, of these, approximately 300 million live in areas in which pollution is six times higher than allowed.

In summary, one can maintain that climate change produces devastating impacts on children and teenagers who, as clearly shown in the image below (UNICEF 2015) range from **disease spreading** (cholera, dysentery, malaria, pneumonia, asthma, ...), to the increase in **malnutrition, forced migrations** – it is estimated that by 2050, between 25 million and 1 billion people will be forced to leave their homes because of climate change (Nielsen 2019) – to effects that impact the whole lifetime of a child, generating or perpetrating **social exclusion or inequalities**.

FIGURE 25. Impact of climate change on children and teenagers



119. For more information: <https://uni.cf/34fGFSt>



These days, besides the adverse effects of climate change, children and teenagers are faced with a new threat: the **COVID-19 pandemic**. Even though the direct effects on children and teenagers (who are inherently more vulnerable than adults) are still hardly quantifiable, it is estimated that the pandemic can add to the current 690 million malnourished people between 80 and 130 million people who in the coming months will suffer some form of **malnutrition** (FAO 2020a).

Besides, the International Labor Organization forecasted **dramatic job cuts in the informal economy**¹²⁰, that employs especially the young and women, on top of the **closing of schools**, which in 188 countries interrupted or modified the education of over 1.5 billion students, jeopardizing their right to education (UNICEF 2020).

The current health, social and environmental emergency witnesses to the urgency of **investing in children and teenagers**, seizing the **multiple opportunities** that come with these age groups. First, today we have the largest young generation ever: 1.8 billion children and young adults aged between 10 and 24 years, almost one fourth of the world population – which is per se an opportunity, if investments are made to prepare the young to transition to the labor market and have a beneficial impact on the economy, the environment and society in view of achieving the SDGs¹²¹.

Data proves that **if the States and the private sector invest in the young, they produce high returns for society**: actions aimed to boost employment and education of the young generate a return on investment of two to five times; conversely, failure to take action produces a reduction up to 34% of the GDP per year (World Bank 2010); every year secondary education generates a return on investment for teenagers of 16% (Psacharopoulos and Patrinos 2018) and, finally, investing in the vocational training of the young increases the productivity of employees – with a return in excess of 200% on the funds invested¹²².

Therefore, **placing the young at the center of post-COVID-19 recovery strategies** and, more in general, of development policies, is key to respond to the current emergencies and build systems that are more resilient to future challenges, in terms of climate change, first, but also of new health, social and economic crises. “Generation Unlimited”¹²³, a global, multi-sector partnership promoted by the United Nations in collaboration with UNICEF, aims

120. Approximately 1.6 billion people employed in the informal economy (especially women and the young) might lose their job due to the lockdown imposed by governments to curb the spread of the disease (United Nations 2020).

121. For more information: <https://www.unicef.org/sdgs>

122. BCG analysis of private sector case studies.

123. For more information: www.generationunlimited.org



to meet the urgent need to extend education, training and work opportunities for the young at an unprecedented scale. It is a fiduciary fund meant to help Countries raise additional finance from private entities and development banks¹²⁴. Next Generation EU is itself an opportunity for the States to guarantee a more sustainable and fairer future for young generations.

124. For more information: <https://bit.ly/2HJ1KgJ>

Conclusions

In 2020 human societies have had to tackle multiple crises, which have been particularly intense in the health, economic and social sphere. Environmental criticalities have nonetheless been equally severe as shown by fires, floods and other climate-related catastrophic events. The urgency of the issues related to the COVID-19 pandemic should not overshadow the issue of climate change, to which healthcare aspects are closely connected as an alteration of the ecosystems increases the risk of epidemics and, conversely, the protection of biodiversity and the fight against global warming have beneficial repercussions also on human health.

We can no longer play down or put off the issue of climate change mitigation and adaptation: the time remaining for keeping global temperature increases under 1.5°C is short and therefore immediate, incisive and globally coordinated action is required.

As such, sustainable finance plays a crucial role, in terms of both strategies and instruments capable of integrating ESG factors, and in particular the “climate factor”, in investment choices, in view of finding the resources necessary to finance mitigation and adaptation solutions. Only a renewed public-private cooperation and post COVID-19 recovery plans geared towards decarbonizing economies enable to seize the opportunity of sustainable development, thus improving the response of societies to future crises. Starting from an awareness of the profound interconnection of the different aspects of sustainability, the financial players that integrate environmental, social and governance criteria can valuably contribute to a successful climate action.

BIBLIOGRAPHY

ANIASA - Associazione Nazionale Industria dell'Autonoleggio e Servizi Automobilistici 2020, 19° Rapporto ANIASA: <https://bit.ly/3iLbQeK>

APRA - Australian Prudential Regulation Authority 2020, *Understanding and managing the financial risks of climate change*: <https://bit.ly/2SekUgt>

ASviS - Alleanza Italiana per lo Sviluppo Sostenibile 2020, *Politiche per fronteggiare la crisi da COVID-19 e realizzare l'Agenda 2030 per lo sviluppo sostenibile*: <https://bit.ly/36lfp7Z>

AXA 2019, *Climate Report 2019*: <https://bit.ly/2SgIffm>

Bank for International Settlements, Banque De France 2020, *The green swan. Central banking and financial stability in the age of climate change*: <https://bit.ly/2DX1kKN>

Bank of England 2020a, *Statement by the Prudential Regulation Authority on prioritisation in light of COVID-19*, 7th May 2020: <https://bit.ly/30ZtuF4>

Bank of England 2020b, *Insurance Stress Test 2019 and Covid-19 stress testing: feedback for general and life insurers*: <https://bit.ly/3ikx1Dc>

Bank of Italy 2020, *Relazione Annuale (anno 2019)*: <https://bit.ly/35K3GQ5>

Belkhir, Lotfi and Elmeligi, Ahmed 2018, "Assessing ICT global emissions footprint: Trends to 2040 & recommendations", *Journal of Cleaner Production*, Vol. 177, 10th March 2018: <https://bit.ly/3kpQAvp>

Bennett, Vanora 2019, "World's first dedicated climate resilience bond, for US\$700m, is issued by EBRD", *Official website of European Bank for Reconstruction and Development*, 20th September 2019: <https://bit.ly/2OUWU0l>

BHP Billiton 2015, *Climate Change: Portfolio Analysis*: <https://bit.ly/2Sscv9r>

Bicciato, Francesco, Lovera, Arianna and Casarsa, Federica 2020, "La finanza sostenibile. Il contenitore per orientare gli investimenti della ripresa economica" in: Leonardi, Matteo (a cura di) 2020, *Ossigeno per la crescita. La decarbonizzazione al centro della strategia economica Post-COVID. Proposte di riforme e azioni per un'economia resiliente*: <https://bit.ly/2S8Wa9d>

BNEF 2020, *Electric Vehicle Outlook 2020*: <https://bit.ly/34ZWrBn>

Bompan, Emanuele 2016, *Che cosa è l'economia circolare*, Milano: Edizioni Ambiente

BP 2018, *BP Statistical Review of World Energy*: <https://on.bp.com/2GeJrj4>

BSR 2018, *Climate and Supply Chain: The Business Case for Action*: <https://bit.ly/3jjnWfm>

Cadan, Yossi, Mokgopo, Ahmed and Vondrich, Clara 2019, *\$11 trillion and counting*: <https://bit.ly/3nUpPSf>

Capgemini 2020, *The great digital divide*: <https://bit.ly/35LFGfp>

Carney, Mark 2015, "Breaking the Tragedy of the Horizon – climate change and financial stability", *Speech given at the Lloyd's of London*, 29th September 2015: <https://bit.ly/3j3HuTX>

CBI - Climate Bonds Initiative 2018, *Sovereign green bonds briefing*: <https://bit.ly/2S4jpkG>

CBI - Climate Bonds Initiative 2019, *Climate Resilience Principles A framework for assessing climate resilience investments*: <https://bit.ly/3fMs71p>

CBI - Climate Bonds Initiative 2020, *Green Bonds Global State of the Market 2019*: <https://bit.ly/3j60d2d>

CEN - Circular Economy Network and ENEA 2020, *Rapporto sull'economia circolare in Italia 2020. Con focus sulla bioeconomia*: <https://bit.ly/32PDv8A>

CENSIS 2020, *Italia sotto sforzo. Diario della transizione 2020*: <https://bit.ly/3lWsnh7>

Centemero, Massimo and Bottazzoli, Elisabetta 2020, *Biowaste. Risorsa per l'Economia Circolare, Organic Biorecycling 2020*, Milano: Edizioni Ambiente

Cheng, Lijing et al. 2020, "Record-setting ocean warmth continued in 2019", *Advances in Atmospheric Sciences*, Vol. 37, February 2020: <https://bit.ly/2YZK5qV>

CIFOR - Center for International Forestry Research 2012, *Drivers of deforestation and forest degradation: A synthesis report for REDD+ Policymakers*: <https://bit.ly/301ant8>

Circle Economy 2020, *The Circularity Gap Report 2020*: <https://bit.ly/3jbA7L4>

CMCC Foundation - Centro Euro-Mediterraneo sui Cambiamenti Climatici 2020, *Analisi del rischio. I cambiamenti climatici in Italia*: <https://bit.ly/3ihrpK4>

CPI - Climate Policy Initiative 2019, *Global Landscape of Climate Finance 2019*: <https://bit.ly/39cPAWU>

CSO Equity Review 2019, *Can climate change fuelled loss and damage ever be fair?*: <https://bit.ly/30TItii>

Del Giudice, Alfonso 2018, "Rating ESG: la correlazione con performance e rischi", *From the seminar "Rating di sostenibilità. Università e industria finanziaria a confronto"*, 19th November 2018: <https://bit.ly/3ml5bUO>

Di Marco, Moreno et al. 2020, "Sustainable development must account for pandemic risk", *PNAS*, 25th February 2020: <https://bit.ly/2HvmN6a>

Durkee, Alison 2020, "Major Investors To Fed: Act On Climate Change Or Face 'Disastrous' Economic Consequences", *Forbes*, 21st July 2020: <https://bit.ly/2Ecl6cs>

EBA - European Banking Authority 2019, *EBA Action Plan on Sustainable Finance*: <https://bit.ly/30ZzSvT>

EBF - European Banking Federation 2019, *Encouraging and rewarding sustainability. Accelerating sustainable finance in the banking sector*: <https://bit.ly/316gA7K>

ECB – European Central Bank 2020a, "ECB launches review of its monetary policy strategy", *Press release*, 23rd January 2020: <https://bit.ly/2FY5Z7K>

ECB – European Central Bank 2020b, *Public consultation on the draft ECB Guide on climate-related and environmental risks*: <https://bit.ly/2H86Dzr>

ECB – European Central Bank and Banking Surveillance 2020, *ECB Banking Supervision: Guide on climate-related and environmental risks*: <https://bit.ly/2ZLERzS>

EEA - European Environmental Agency 2015, "Cambiamento climatico e salute umana", *Interview to Bettina Menne*, 22nd September 2015: <https://bit.ly/33eDOu5>

EEA - European Environmental Agency 2019a, *Air pollution sources*: <https://bit.ly/3eWJc7y>

EEA - European Environmental Agency 2019b, *Air quality in Europe - 2019 report*: <https://bit.ly/2D7LUd8>

EEA - European Environmental Agency 2019c, *Emissions of air pollutants from transport*: <https://bit.ly/34WPI4U>

EEA - European Environmental Agency 2019d, *Greenhouse gas emissions from transport in Europe*: <https://bit.ly/31dpLmV>

EEA - European Environmental Agency 2020, *Air quality and COVID-19*: <https://bit.ly/3k1Swu5>

EIB – European Investment Bank 2017, *Cleaner Transport Facility: Supporting the deployment of cleaner transport*: <https://bit.ly/3mvS1u0>

EIB – European Investment Bank 2020a, *Sustainable transport overview*: <https://bit.ly/2EcDQIZ>

EIB – European Investment Bank 2020b, *The EIB circular economy guide. Supporting the circular transition*: <https://bit.ly/2EOdQUC>

EIOPA - European Insurance and Occupational Pensions Authority 2019, *2019 Occupational pensions stress test*: <https://bit.ly/3dw1a1E>

Element Energy 2019, *Batteries on wheels: the role of battery electric cars in the EU power system and beyond*: <https://bit.ly/2RFT10I>

Ellen MacArthur Foundation 2019, *Completing the picture. How the circular economy tackles climate change*: <https://bit.ly/3ihIBPt>

ENEA 2019, *Innalzamento del Mar Mediterraneo in Italia - Aree costiere e porti a rischio inondazione al 2100*: <https://bit.ly/2EFsA8p>

Enerdata 2018, *Between 10 and 20% of electricity consumption from the ICT sector in 2030?*: <https://bit.ly/3hEZinx>

Engel, Hauke, Enkvist, Per-Anders e Henderson, Kimberly 2015, “How companies can adapt to climate change”, *McKinsey & Company*, 1st June 2015: <https://mck.co/2GnD0tF>

Equinor 2018, *Sustainability Report 2018*: <https://bit.ly/2Gsl6ol>

Ericsson 2020, *A quick guide to your digital carbon footprint*: <https://bit.ly/2FEn7Py>

ESMA - European Securities and Markets Authority 2020, *ESAs consult on environmental, social and governance disclosure rules*: <https://bit.ly/33D6YC1>

ETIFOR 2020, *Deforestation made in Italy. Le responsabilità delle imprese e dei consumatori italiani nella deforestazione dei paesi tropicali*: <https://bit.ly/3mLijlL>

EU High Level Expert Group (HLEG) on Sustainable Finance 2018, *Financing a sustainable European economy - Final Report*: <https://bit.ly/349kUUE>

EU Technical Expert Group (TEG) on Sustainable Finance 2019a, *Report on EU Green Bond Standard - Overview*: <https://bit.ly/3auxoc5>

EU Technical Expert Group (TEG) on Sustainable Finance 2019b, *TEG final report on climate benchmarks and benchmarks' ESG disclosures*: <https://bit.ly/314sjEp>

EU Technical Expert Group (TEG) on Sustainable Finance 2020a, *Taxonomy: Final report of the Technical Expert Group on Sustainable Finance*: <https://bit.ly/3kqRXKj>

EU Technical Expert Group (TEG) on Sustainable Finance 2020b, *Taxonomy Report: Technical Annex*: <https://bit.ly/347l6T5>

EU Technical Expert Group (TEG) on Sustainable Finance 2020c, *Usability Guide – EU Green Bond Standard*: <https://bit.ly/3g3pmZ1>

European Commission 2012, *Communication from the Commission – Strategy for the sustainable competitiveness of the construction sector and its enterprises*, 31st July 2012: <https://bit.ly/3iURb7K>

European Commission 2013, *Communication from the Commission – A new EU Forest Strategy: for forests and the forest-based sector*, 20th September 2013: <https://bit.ly/37T1syH>

European Commission 2014, *Communication from the Commission – On resource efficiency opportunities in the building sector*, 1st July 2014: <https://bit.ly/2EbhEim>

European Commission 2018, *EU Construction and Demolition Waste Protocol and Guidelines*: <https://bit.ly/3kvaMvW>

European Commission 2019a, *Communication from the Commission – The European Green Deal*, 11th December 2019: <https://bit.ly/3jf0yQ1>

European Commission 2019b, *EU Communication on Stepping up EU Action to Protect and Restore the World's Forests*: <https://bit.ly/3ie5KIM>

European Commission 2019c, *EU transport in figures, Statistical Pocketbook 2019*: <https://bit.ly/2D504M8>

European Commission 2020a, *Communication from the Commission – Shaping Europe's digital future*, 19th February 2020: <https://bit.ly/3kJ2DVc>

European Commission 2020b, “EU-funded projects to green the economy”, *Press release*, 14th January 2020: <https://bit.ly/3iWq4lQ>

European Commission 2020c, *Proposal for a regulation of the European Parliament and of the Council establishing the just transition Fund*, 14th January 2020: <https://bit.ly/3jGYKPk>

European Commission 2020c, “Sustainable Finance: Commission welcomes the adoption by the European Parliament of the Taxonomy Regulation”, *Press release*, 18th June 2020: <https://bit.ly/2FJEtur>

European Compost Network 2019, *ECN Status report 2019 – European Bio-waste Management*: <https://bit.ly/3ikw2CW>

European Federation for Transport and Environment AISBL 2020, *Can electric cars beat the COVID crunch?*: <https://bit.ly/33962pH>

European Lab@EFRAG – Project task force on climate-related reporting 2020, *How to improve climate-related reporting*: <https://bit.ly/3n6V5NJ>

Eurosif 2018, *European SRI Study 2018*: <https://bit.ly/2CWmAGP>

Eurostat 2019, *Energy balances – 2017 data – 2019 edition*: <https://bit.ly/33ihkbg>

Fabre, Marina 2018, “Si internet était un pays, ce serait le sixième consommateur d'énergie et le septième émetteur de CO2”, *Novéthic*, 15th May 2018: <https://bit.ly/2HdeBHK>

Fabre, Marina 2020, “Pour la France, le sauvetage de l'aéronautique passe par l'aviation zero carbon”, *Novéthic*, 9th June 2020: <https://bit.ly/3mwJoiK>

FAO – Food and Agriculture Organization of the United Nations 2020a, *The state of food security and nutrition in the world 2020*: <https://bit.ly/2FvnNXk>

FAO - Food and Agriculture Organization of the United Nations 2020b, *The State of the World's Forests. Forests, biodiversity and people*: <https://bit.ly/2SnLZ0w>

FFS - Forum per la Finanza Sostenibile 2016, *Finanza sostenibile e cambiamento climatico*: <https://bit.ly/2gGMSS2>

FFS - Forum per la Finanza Sostenibile 2017, *Impact Investing: la finanza a supporto dell'impatto socio-ambientale*: <https://bit.ly/3igBXZX>

FFS - Forum per la Finanza Sostenibile 2018, “Social network e sicurezza dei dati: allarme “governance” tra gli investitori SRI”, *Investiresponsabilmente.it*, 26th April 2018: <https://bit.ly/2RJswNT>

FFS - Forum per la Finanza Sostenibile and CONAI 2018, *Finanza sostenibile ed economia circolare. Linee guida per investitori e imprese*: <https://bit.ly/2uwVUBn>

FFS - Forum per la Finanza Sostenibile 2019a, “I rischi socio-economici del cambiamento climatico”, *Investiresponsabilmente.it*, 14th March 2019: <https://bit.ly/2ZnMrOP>

FFS - Forum per la Finanza Sostenibile 2019b, *The European Union and sustainable finance. Impacts and outlook for the Italian market*: <https://bit.ly/3IRkyK0>

FFS - Forum per la Finanza Sostenibile 2020, “Finanza sostenibile in prima linea per il rilancio dell’economia”, *Il Sole 24 Ore*, 15th April 2020: <https://bit.ly/3mAhhVg7>

FFS - Forum per la Finanza Sostenibile and COMIECO 2020, *Innovazione circolare. La finanza sostenibile e la filiera di carta e cartone*: <https://bit.ly/3kBhccT>

Fondazione per lo Sviluppo Sostenibile and FISE Unicircular 2019, *L'Italia del riciclo 2019*: <https://bit.ly/30nFdMG>

GBP - Green Bond Principles and ICMA – International Capital Market Association 2018, *Green Bond Principles. Voluntary Process Guidelines for Issuing Green Bonds*: <https://bit.ly/3nSRMKc>

GIIN - Global Impact Investing Network 2020, *2020 Annual Impact Investor Survey*: <https://bit.ly/3mH9cJ4>

Griscom, Bronson W. et al. 2019, "Natural climate solutions", *PNAS*, 31st October 2017: <https://bit.ly/34a31Vw>

GSAM - Goldman Sachs Asset Management 2020, *GSAM Insurance Report*: <https://bit.ly/3dycevk>

I4CE - Institute for Climate Economics 2018, *Getting started on Physical climate risk analysis in finance - Available approaches and the way forward*: <https://bit.ly/3cHnFjF>

ICCR - Interfaith Center On Corporate Responsibility 2020, *Investors statement on Coronavirus Response*: <https://bit.ly/3l0m00F>

IEA - International Energy Agency 2017, *Energy Technology Perspectives 2017*: <https://bit.ly/2SdzvZI>

IEA - International Energy Agency 2019a, *Energy Efficiency 2019*: <https://bit.ly/2EMp6B1>

IEA - International Energy Agency 2019b, *World Energy Model. Scenario analysis of future energy trends*: <https://bit.ly/3knWD3s>

IEA - International Energy Agency 2020a, *Aviation*: <https://bit.ly/36eVqrq>

IEA - International Energy Agency 2020b, *Global Energy Review*: <https://bit.ly/32F0zaa>

IEA - International Energy Agency 2020c, *World Energy Investment*: <https://bit.ly/33hxCRQ>

Il Sole 24 Ore 2019, "Gli aerei sono il mezzo di trasporto più inquinante. Tutti i numeri", 28th September 2019: <https://bit.ly/2Fw8wFX>

IPBES - Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services 2018, *Media Release: Worsening Worldwide Land Degradation Now 'Critical', Undermining Well-Being of 3.2 Billion People*, 23rd March 2018: <https://bit.ly/32YTP7i>

IPCC - Intergovernmental Panel on Climate Change 2018, *Global Warming of 1.5°C*: <https://bit.ly/2HO3OnF>

IPCC - Intergovernmental Panel on Climate Change 2019, *Climate Change and Land*: <https://bit.ly/36t9QEH>

IPPR - Institute for Public Policy Research 2019, *This is a crisis: Facing up to the age of environmental breakdown*: <https://bit.ly/3iJqvHe>

ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale 2018, *Emissioni nazionali di gas serra: Indicatori di efficienza e decarbonizzazione nei principali Paesi Europei*: <https://bit.ly/3kFrHMs>

ISPRA - Istituto Superiore per la Protezione e la Ricerca Ambientale 2019, *Rapporto Rifiuti Urbani. Edizione 2019*: <https://bit.ly/3ilaYw0>

Ivanova, Diana and Wood, Richard 2020, "The unequal distribution of household carbon footprints in Europe and its link to sustainability", *Global Sustainability*, Volume 3, 6th July 2020: <https://bit.ly/3mY0KFE>

Khalaf, Roula and Arnold, Martin 2020, "Lagarde puts green target top of ECB agenda in bond buying", *Financial Times*, 9th July 2020: <https://on.ft.com/3cDlk9B>

Khan, Mehreen 2020, "EU explores green bonds as part of €750bn borrowing spree", *Financial Times*, 13th September 2020: <https://on.ft.com/2S3yHGD>

Kompas, Tom, Pham Van Ha and Che Tuong Nhu 2018, "The Effects of Climate Change on GDP by Country and the Global Economic Gains from Complying With the Paris Climate Accord", *Earth's Future*, 13th July 2018: <https://bit.ly/347DuMD>

KPMG 2017, *The road ahead. The KPMG Survey of Corporate Responsibility Reporting 2017*: <https://bit.ly/2Ej3yvC>

Kulp, Scott A. and Strauss Benjamin H. 2019, "New elevation data triple estimates of global vulnerability to sea-level rise and coastal flooding", *Nature Communications*, 29th October 2019: <https://go.nature.com/3fSsiYS>

Le Quéré, Corinne et al. 2020, "Temporary reduction in daily global CO2 emissions during the COVID-19 forced confinement", *Nature Climate Change*, 19th May 2020: <https://go.nature.com/3mZHfE>

Material Economics 2018, *The Circular Economy. A Powerful Force for Climate Mitigation*: <https://bit.ly/3kPTvxw>

MATTM - Ministero dell'Ambiente e della Tutela del Territorio e del Mare 2017, *Elementi per una roadmap della mobilità sostenibile*: <https://bit.ly/3lQlAnT>

McKinsey Global Institute 2020, *Could climate become the weak link in your supply chain?*, 6th August 2020: <https://mck.co/33boldU>

Milburn, Ella 2020, "Green bond fund for central banks hits \$1bn, says Bank for International Settlements", *Responsible Investor*, 1st July 2020: <https://bit.ly/2Y8Enm6>

Mirova 2018, *Turning the tide on the conservation of our oceans*, 16th November 2018: <https://bit.ly/3mZZsdh>

MISE - Ministero dello Sviluppo Economico 2019, *Piano Nazionale Integrato per l'Energia e il Clima*: <https://bit.ly/341k7Gp>

Morgan, Sam 2020, "EU invests €350m in first domestic battery Gigafactory", *Euractiv*, 30th July 2020: <https://bit.ly/2RNff0D>

Morrow Sodali 2020, *Institutional Investor Survey 2020*: <https://bit.ly/3bMnZx8>

NGFS - Network for Greening the Financial System 2020, *Guide to climate scenario analysis for central banks and supervisors*: <https://bit.ly/30hjLJz>

Nielsen, Anja 2019, "Climate migration and education: are we making our education systems future-proof?", *The Education and Development Forum*, 2nd December 2019: <https://bit.ly/3mvtK7j>

OECD 2020, *Public consultation document: Review of Country-by-Country Reporting (BEPS Action 13)*: <https://bit.ly/2GerOzu>

OVAM 2019, *Seven messages about the circular economy and climate change*: <https://bit.ly/3ib2U16>

Oxfam 2019, *Forced from Home. Climate-fuelled displacement*: <https://bit.ly/335zWLU>

Oxfam 2020, "Carbon emissions of richest 1 percent more than double the emissions of the poorest half of humanity", *Press release*, 21st September 2020: <https://bit.ly/3cDc4C6>

Pedol, Miriam 2019, *Sustainability as a Strategic risk approach: Sustainability Option into Non-Life Insurance Pricing*: <https://bit.ly/3nT9WeT>

Pellizzari, Anna and Genovesi, Emilio 2017, *Neomateriali nell'Economia Circolare*, Milano: Edizione Ambiente

Poore, J. and Nemecek, T. 2018, "Reducing food's environmental impacts through producers and consumers", *Science*, Vol. 360, 1st June 2018: <https://bit.ly/2ZZiCG8>

PRI - Principles for Responsible Investment 2018, *Climate change and the just transition: a guide for investor action*: <https://bit.ly/3mA7ZmQ>

PRI - Principles for Responsible Investment 2019, *An introduction to responsible investment in forestry*: <https://bit.ly/30iOpC3>

Primini, Noemi 2020, “atlante.SRI. Climatici campioni qualità Esg”, *ETicaNews*, 28th July 2020: <https://bit.ly/3mERfuJ>

Psacharopoulos, George and Patrinos, Harry A. 2018, “Returns to investment in education: a decennial review of the global literature”, *Taylor & Francis Online*, 7th June 2018: <https://bit.ly/2Sax7CW>

Radovanovic, Ana 2020, “Our data centers now work harder when the sun shines and wind blows”, *Data centre and infrastructure, Google Blogs*, 22nd April 2020: <https://bit.ly/3mFFTXF>

Rau, Thomas and Oberhuber, Sabine 2019, *Material Matters. L'importanza della materia. Un'alternativa al sovrasfruttamento*, Milano: Edizioni Ambiente

Ref Ricerche 2020a, *Gestione dei rifiuti: per le imprese costi in aumento*: <https://bit.ly/3l6BwDo>

Ref Ricerche 2020b, *I distretti e la gestione dei rifiuti: la simbiosi industriale per chiudere il ciclo*: <https://bit.ly/36l7ure>

Reuters 2019, *EU approves 3.2 billion euro state aid for battery research*, 9th December 2019: <https://bit.ly/3klv6tB>

Ripple, William J. et al. 2020, *World Scientists' Warning of a Climate Emergency*, *BioScience*, Vol. 70, Issue 1, January 2020: <https://bit.ly/32Vg3HD>

SASB - Sustainability Accounting Standard Board 2020, *Promoting Clarity and Compatibility in the Sustainability Landscape*: <https://bit.ly/33Jb4ZI>

Shareholders for Change 2019, *Engagement Report. Statements, votes, dialogues*: <https://bit.ly/2H0sd9m>

Shugar, Dan H. et al. 2020, “Rapid worldwide growth of glacial lakes since 1990”, *Nature Climate Change*, 31st August 2020: <https://go.nature.com/32MY9oJ>

Silano, Sara 2020, "La raccolta dei fondi sostenibili resiste al Coronavirus", *Morningstar.it*, 27th April 2020: <https://bit.ly/3in9wdp>

Smale, Dan A. et al. 2019, *Marine heatwaves threaten global biodiversity and the provision of ecosystem services*, *Nature Climate Change*, April 2019: <https://bit.ly/34XSwGW>

Smith, Ben et al. 2020, "Pervasive ice sheet mass loss reflects competing ocean and atmosphere processes", *Science*, 12 June 2020: <https://bit.ly/36jUp1n>

TCFD - Task Force on Climate-Related Financial Disclosures 2017, *Final Report: Recommendations*: <https://bit.ly/3c97fjZ>

UN DESA - United Nations Department of Economic and Social Affairs 2018, *Percentage of population in urban and rural areas*: <https://bit.ly/32SFU2w>

UNEP - United Nations Environment Programme 2019, *Emissions Gap Report 2019*: <https://bit.ly/33hV0i4>

UNEP - United Nations Environment Programme 2020, *Managing environmental, social and governance risks in non-life insurance business*: <https://bit.ly/2ZR4Cyb>

UNFCCC - United Nations Framework Convention on Climate Change 2011, *Assessing the costs and benefits of adaptation options. An overview of approaches*: <https://bit.ly/3j19ibl>

UNICEF - United Nations Children's Fund 2015, *Unless we act now: The impact of climate change on children*: <https://uni.cf/2EMVvHs>

UNICEF - United Nations Children's Fund 2017, *Danger in the air: How air pollution may be affecting the brain development of young children around the world*: <https://uni.cf/3i6Nf4u>

UNICEF - United Nations Children's Fund 2019, *An Environment Fit for Children. UNICEF's Approach to Climate Change*: <https://uni.cf/36osxsQ>

UNICEF - United Nations Children's Fund 2020, *Education and COVID-19*: <https://bit.ly/2H8V77b>

United Nations 2020, "Nearly half of global workforce at risk as job losses increase due to COVID-19: UN labour agency", *UN News*, 28th April 2020: <https://bit.ly/3dxNMtG>

United Nations General Assembly 2018, *Global Compact for Safe, Orderly and Regular Migration*, Resolution 73/195: <https://bit.ly/36lg88W>

University of Cambridge Institute for Sustainability Leadership 2020, *Bank 2030: Accelerating the transition to a low carbon economy*: <https://bit.ly/33dSKsa>

Utilitalia 2019, “Commissione parlamentare d’inchiesta sulle attività illecite connesse al ciclo dei rifiuti e su illeciti ambientali ad esse correlati. Emergenza epidemiologica COVID-19 e gestione dei rifiuti”, *Utilitalia’s essay on the Parliamentary inquiry of the 19th May 2019*: <https://bit.ly/3cN2ahk>

Van Houten, Frans and Ishii, Naoko 2020, *The world needs a circular economy. Help us make it happen*, 22nd January 2020: <https://bit.ly/2FIKVIp>

Vigeo Eiris 2020, *Corporate Social Responsibility: The COVID-19 Stress Test*: <https://bit.ly/2ZtpfjJ>

Visco, Ignazio 2019, “Sviluppo sostenibile e rischi climatici: il ruolo delle banche centrali”, *Opening intervention at the Festival dello Sviluppo Sostenibile 2019*, 21st May 2019: <https://bit.ly/2wtiMq8>

WHO - World Health Organization 2016, *Preventing disease through healthy environments. A global assessment of the burden of disease from environmental risks*: <https://bit.ly/3n2Av0Q>

WMO - World Meteorological Organization 2019, “2019 concludes a decade of exceptional global heat and high-impact weather”, *Press release*, 3rd December 2019: <https://bit.ly/32JAFm7>

World Bank 2010, *Investing in your country’s children and youth today: good policy, smart economics*: <https://bit.ly/3jokAI2>

World Bank 2018, *Groundswell: Preparing for Internal Climate Migration*: <https://bit.ly/2RF1Vel>

World Economic Forum 2020, *The Global Risks Report 2020*: <https://bit.ly/3kFrbOw>

WWF - World Wildlife Fund Italia 2020a, *Malattie trasmissibili e cambiamento climatico. Come la crisi climatica incide su zoonosi e salute umana*: <https://bit.ly/3mPoCvc>

WWF - World Wildlife Fund Italia 2020b, *Pandemie, l'effetto boomerang della distruzione degli ecosistemi. Tutelare la salute umana conservando la biodiversità*: <https://bit.ly/32Sq7j3>

PROMOTERS

Promoter: Italian Sustainable Investment Forum

Partner: WWF

SUPERVISION

Francesco Bicciato, Italian Sustainable Investment Forum

COORDINATION

Arianna Lovera, Italian Sustainable Investment Forum

RESEARCH AND EDITING

Alessandro Asmundo, Federica Casarsa and Chiara Lemmi, Italian Sustainable Investment Forum

ACKNOWLEDGMENTS

ItaSIF thanks all the participants in the four meetings of the Working Group “Sustainable climate investments”.

In particular, for their testimonials in the working group and their contribution in drawing up the handbook: Aldo Bonati ETICA SGR, Elisabetta Bottazzoli, Lucio Brotto ETIFOR, Andreas Büchler 2° INVESTING INITIATIVE, Virginia Canazza REF-E, Barbara Galliano NATIXIS INVESTMENT MANAGERS, Giulia Galluccio FONDAZIONE CMCC, Andrea Gasperini AIAF, Maria Lilli, MSCI, Velina Karadzhova MSCI, Matteo Leonardi WWF e REF-E, Federico Merola ARPINGE SPA, Fabio Moliterni ETICA SGR, Francesca Morra HERBERT SMITH FREEHILLS, Pietro Negri ANIA, Elisa Ossola JOINT RESEARCH CENTRE, Lorenzo Parola HERBERT SMITH FREEHILLS, Claudia Pasquini ABI, Valeria Piani UBS AM, Federico Pinato ETIFOR, Alex Pra ETIFOR, Gianfranco Refosco CISL VENETO, Clio Scandola REF-E, Eugenio Sini FONDAZIONE CMCC, Riccardo Spani FONDAZIONE ENI ENRICO MATTEI, Emmeline Stein 2° INVESTING INITIATIVE, Angela Tanno ABI, Giovanna Zacchi BPER BANCA, Chiara Zanetti UNICEF

DISCLAIMER

The authors of the individual contributions and the coordinators of this publication shall only be liable for the contents expressed in this text. This applies to all of the organizations that are members of the Forum, which, even though they encouraged and approved the project as a whole, do not necessarily agree with each and every statement included in this document – which, for this reason, does not reflect their position on this topic. This document has been drawn up for information and dissemination purposes. The reproduction of contents is in no way limited: quite to the contrary, it is encouraged. Please always quote the Italian Sustainable Investment Forum and the authors who have provided and signed their contributions.



Forum per la Finanza Sostenibile

The Italian Sustainable Investment Forum (ItaSIF) is a not for profit association founded in 2001. Its membership base is multi-stakeholder: its members are financial actors and other organizations interested in the environmental and social impacts of financial activities. ItaSIF mission is to promote the awareness and the strategies linked to sustainable investments, with the aim to encourage the integration of environmental, social and governance criteria into financial products and processes.

ItaSIF activities are divided into three main areas: research, projects and advocacy.

Within these sectors ItaSIF:

- runs research and education activities and facilitates working groups to promote best practice and contribute to the analysis and growth of sustainable investments;
- informs and advises the financial community, the media and society as a whole, on sustainable finance through the organisation of communication campaigns, conferences, seminars and cultural events;
- engages with Italian and European institutions to encourage the implementation of a regulatory framework promoting sustainable investments.

Since 2012, ItaSIF has organized the Italian SRI Week, one of the leading initiatives in Italy on sustainable and responsible investment.

ItaSIF is a member of Eurosif, the association for the promotion of sustainable investment in the European market.



With its 5 million supporters, in 96 countries around the world and over 2,000 projects, WWF is the world's largest organization for the conservation of nature.

Founded in Switzerland in 1961, the World Wide Fund for Nature was created with the aim of protecting nature and the planet ecology. The panda logo, one of the best known in the world, represents a symbol of commitment, concreteness and positivity for the protection of our ecosystems.

The activities of the WWF are inspired and give contribution to its founding values: scientific approach, integration of the global and the local level, synergy and participation, independence. Thanks to the support of citizens and the involvement of companies and institutions, WWF daily contributes to preserving natural systems and works to activate the necessary changes to lead to a more sustainable life, using innovative methods and aggregating the best cultural, social and economic resources.

Study realized by



Forum per la
Finanza Sostenibile

In collaboration with



With the support of

BPER:
Banca

