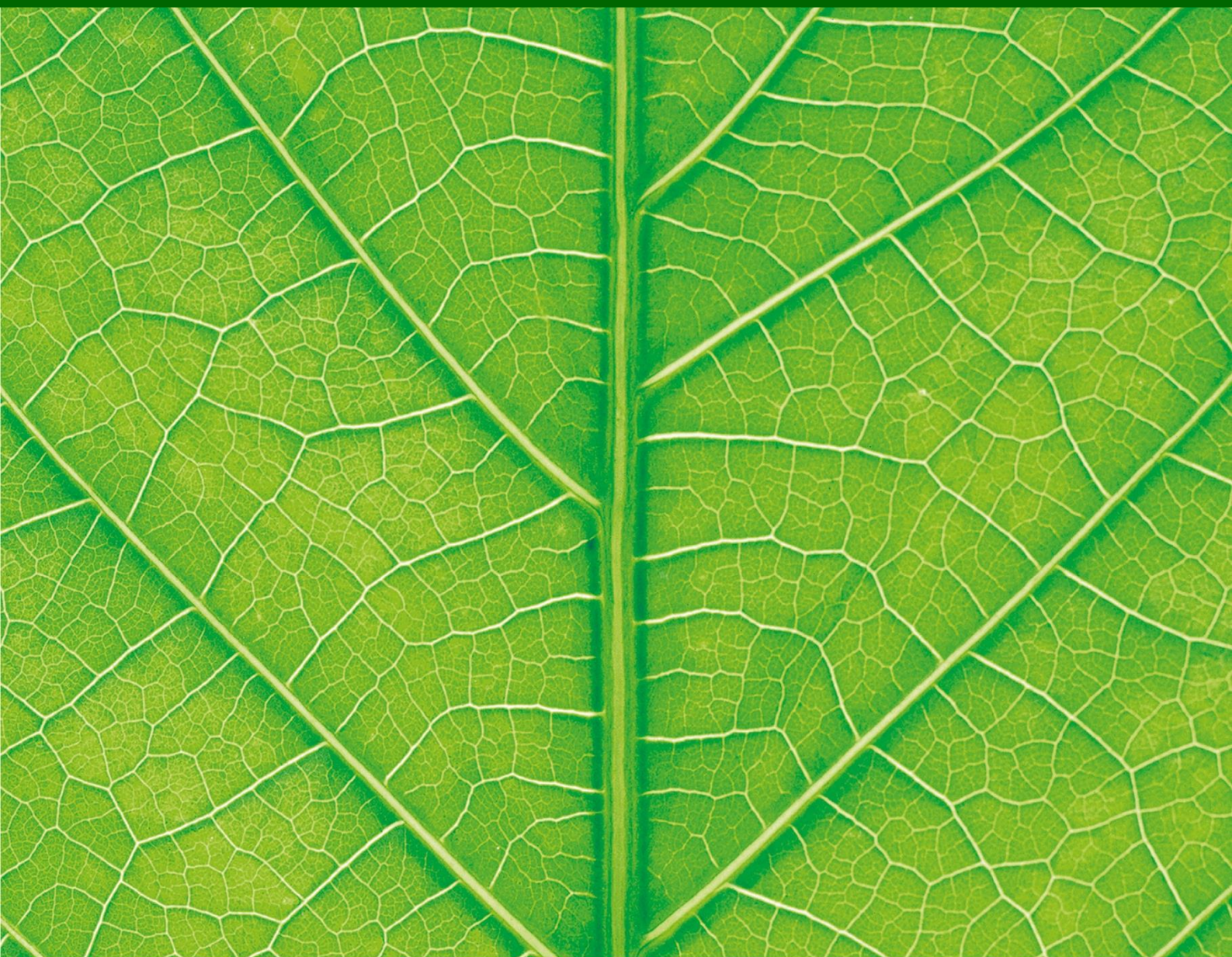


BTP Green

Allocation and Impact Report

2023





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Executive Summary

This **2023 BTP Green Allocation and Impact Report** refers to the **proceeds collected in 2022** through the issuances of **BTP Green**¹ and it shows the allocation of such proceeds to several State budget expenditures in line with the criteria spelled out in the **Italian Sovereign Green Bond Framework**² together with the positive environmental impact of the interventions made possible by such expenditures. In addition, the Report presents a detailed analysis of the programmes and projects according to their financial nature (tax expenditures, capital expenditures and current expenditures), their temporal distribution during the 2019-2022 four-year period and to their relative weight to the total amount allocated.

For this edition of the Report, the structure of the **Treasury Department**, established in the Ministry of Economy and Finance, could rely on the support of the Directorate Sectoral Strategies and Impact of the **Cassa Depositi e Prestiti S.p.A.** Furthermore, all data and analyses presented in this Report refer to information available as of 30 April 2023.

The resources raised through the bonds issuance have been entirely used to finance the **six categories of expenses** present in the State budget in the 2019-2022 four-year period and eligible to be financed with the **BTP Green** in line with the Green Bond Framework: **1)** Renewable sources for electricity and heat production; **2)** Energy efficiency; **3)** Transport; **4)** Pollution prevention and control and circular economy; **5)** Protection of the environment and biological diversity and **6)** Research.

The allocation of the net proceeds of the issuances has been distributed over the 2019-2022 four-year period. With respect to the various typologies of expenditures, the **category 2**, related to **intervention for Energy efficiency**, represents the major measure financed (with **47.5%** of the total expenditure), while the **category 3**, related to **transport**, is the second class of expenditure (with **33%** of the total allocated). A significant part of this category is related to capital expenditures (rail infrastructures, electrification of railway sections, realization of new High Speed/High Capacity (HS/HC) sections and of subways) and to contributions in support of railway mobility for passengers and freight. To the **Protection of the environment and biological diversity (category 5)** a share equal to **10.9%** of the total expenditure is allocated. Within the **category 5**, Marine Protected Areas (MPA), National Parks (NP) and State Nature Reserves (SNR) are the main beneficiaries of the financing. Moreover, significant resources have been assigned for the realization of the MO.S.E., for investments in water infrastructures, as well as for other programmes, projects and international agreements aimed at the protection of the environment. The **category 6**, related to **research**, represents **5.1%** of the total expenditures financed through the issuance of **BTP Green** in 2022. The Italian Institute for Environmental Protection and Research (ISPRA) represents, in this category, the major beneficiary of resources. Finally, the **category 4**, related to the measures for **Pollution prevention and control and circular economy**, and the **category 1** – Renewable sources for electricity and heat production related to the **incentives for the production of energy from renewable sources** – represent respectively **2.9%** and **0.7%** of the total *green* expenditure reported for the 2019-2022 four-year period.

¹ The issues have a maturity of April 30th, 2035, annual coupon of 4%, of which two *tranches* have been allocated for a total nominal value of 8 billion euros, corresponding to a gross annual yield at issue of 4,067%. The second issue of the year has been placed through auction. The first issue has been placed through a syndicate for 6 billion euros at a price of 99,734, the first time for a BTP Green. 2 billion euros of nominal amount were assigned with a demand greater than 3 billion euros. The bond was placed with a price of 97,88, corresponding to a gross annual yield of 4,26%.

² Published on February 25th, 2021.

For the total allocated resources, the distribution of the expenditures over time has been performed in the most balanced possible way during the 2019-2022 four-year period, with a greater weight attributed to the year 2019 (**37.5%** of the total expenditure) and an underweight for the year 2021 (**8%** of the total expenditure).

The entire process of selection and reporting of the eligible expenses has its origin in an analysis of the State budget aimed at the identification of the budget units whose characteristics likely show the possibility of positive effects on the environment. This process is carried out under the supervision of the **Interministerial Committee for the monitoring and publication of the information necessary for the issuance of sovereign Green Bonds**³.

Indeed, after having ascertained the consistency of the expenditure item with the aims of the principles of the International *Capital Market Association* (ICMA) to which the Italian Sovereign Green Bond Framework is based on, the representatives of the Ministries members of the Committee were asked: *i)* to verify the correspondence to the environmental objectives pursued; *ii)* to check that there were not direct financing channels for those budget chapters; *iii)* to ensure the ability of the administration to monitor punctually the spending process and the actual use of the sums for the foreseen purposes.

In the expectation of the entry into force of the new European Regulation that introduces the **European Green Bond Standard (EuGBS)**⁴ but also with the aim to provide investors with the most suitable information in relation to recent new part of the European regulation on sustainable finance, it was decided to start, already in the present Report, a first exercise of a simplified application of the EU Taxonomy⁵, aimed at **evaluating the traceability of the allocated expenditures to the economic activities classified as potentially eco-compatible** according to the above mentioned Taxonomy. In this respect, in the present Report a specific section has been added to evaluate whether the measures allocated in the 2019–2022 four-year period are in the list of the «**relevant**» economic activities for the purpose of the EU Taxonomy, as **potentially environmentally sustainable** and capable to contribute to the achievement of the objectives of the European *Green Deal*.

The **8.1 billion** of euros of **expenditures** environmentally eligible, identified in the Italian State budget during the 2019-2022 four-year period in correspondence to the proceeds coming from the **BTP Green** issuances carried out in 2022, that have been made available to the national economic system, have produced **significant impacts**, which can be quantified in about **13 billion of euros** in terms of added value, which corresponds to about 0.7% of GDP. This estimate implies that **every million euro of expenditures financed in the sectors interested by the allocation is capable of generating about 1.6 million euros of added value**. The added value stimulated by the expenditures carried out thanks to the funds obtained through the issuance of green State bonds has relevant effects on the demand of workers needed to satisfy this level of economic activity. This demand can be quantified in **over 200 thousand units of labour**: in other words, **every million euro of incurred expenses active about 25 units of labour**.

With respect to the **evaluation of the potential environmental impact** of these expenditures, the Report gives evidence – where available, or in any case valuable on a scientific basis – of the

³ The Committee is established by the Italian Prime Ministerial Decree issued on October 9th, 2020, in compliance with the provisions of the Italian Stability Law for 2020 (Italian Law No. 160 of December 27th, 2019). This Committee is composed by the following Ministries (the Ministries are reported according to their current denomination): Ministry of Economy and Finance (MEF); Ministry of infrastructures and transport (MIT); Ministry of Environment and Energy Security (MASE); Ministry of Agriculture, Food Sovereignty and Forests (MASAF); Ministry of Enterprises and Made in Italy (MIMIT); Ministry of University and Research (MUR); Ministry of Culture (MIC). Cfr. [BTP Green Inter-Ministerial Committee - MEF Department of Treasury](#).

⁴ Please refer to the European Commission Regulation Proposal 2021/0191 with reference to which recently a political agreement within the dialogue with the European Council and the European Parliament was found.

⁵ Regulation EU 2020/852 and successive delegated acts.

recorded positive environmental impact of the interventions made possible by the expenditures to which the proceeds of the **BTP Green** have been allocated.

Among the categories that are better suited to an evaluation of the environmental impact of the employed resources it was found, for example, that the **tax incentives for energy efficiency** of buildings, in the various categories of intervention, have contributed to avoid the emission of more than 307 thousand tons of CO₂ in 2019 and of 334 thousand tons of CO₂ in 2020. In the long term, taking into account the entire useful life cycle of the interventions for energy efficiency financed through issuances of **BTP Green**, the virtuous cumulated environmental effects of the measure amount to 7.6 million tons of CO₂ for the interventions initiated in 2019 and to 7.8 million tons of CO₂ for those initiated in 2020.

With respect to the tax incentives for production of electric and thermal energy from renewable sources, the measure financed has avoided about 2.09 million tons of CO₂ in 2021. Taking instead into consideration the whole period of financing of the measure through the issuance of State *green bonds*, that is 2018-2022, the environmental impact of the measure is estimated to be around 8.86 million tons of CO₂.

Significant environmental benefits can be found also in reference to the resources assigned to the sector of transports. In this category, for example, the **measure of support to freight rail traffic** (STFM), in the period of financing of the measure with issuances of **BTPs Green**, has brought an annual average reduction of climate-altering emissions measurable between 150 thousand and 200 thousand tons of CO₂eq.

The Report also offers an assessment of the tangible positive impacts for the environment that can be associated with the expenses and contributions for the **railways infrastructure**, which have contributed to the improvement of the national railway infrastructure, also through **investments in the HS/HC network**, that have made possible a relevant reduction in the time of travel, producing a significant modal *shift* from other modalities of transportation both for passengers and freight, with a related diminution of the CO₂ emitted into the atmosphere and an improvement of the quality of the air. As an example, the Report contains the environmental impact analysis related to two projects from the proceeds of the 2022 **BTP Green 2035** issuance: the new railway line **HS/HC Salerno-Reggio Calabria** and the doubling of the railway system of the **railway junction of Palermo**.

An additional significant employment of the resources obtained by the green bond issuances can be found in the **protection of the biological diversity** and the **national system of protected natural areas**, marine and terrestrial, which contribute to the achievement of the objectives of climate mitigation, thanks to their capacity of absorbing climate-altering emissions, as well as of adapting to climate change, thanks to their role of presiding over the territory. In this respect, it must be pointed out that in Italy as a whole the areas of the national forests allow to absorb annually 4.5 billion of CO₂.

In addition, in cases where the complexity of the financed initiatives does not allow a punctual quantification of their environmental impact, the Report offers a detailed **context analysis**, in which are presented quantitative and qualitative elements which characterize the sectors interested by the allocation presented. These focuses and insights are related to: soil protection and interventions against the hydrogeological disruption; sustainable use and protection of hydric resources; prevention and control of pollution and circular economy; international cooperation for environmental protection.

At the bottom of the Report, the outcome of the Report *External Review* by ISS ESG, the firm selected by the Ministry of Economy and Finance for this purpose, is included.

Introduction



2022 BTP GREEN ISSUES

In 2022, the Italian State issued a new **BTP Green** maturing 30 April 2035, with a 4% annual coupon of which two *tranches* were placed for a total nominal value of **EUR 8 billion**.

The **first issue** was placed through syndication for **EUR 6 billion** at a price of 99.734, corresponding to a 4.067% gross annual yield at issue. Around **290 investors** participated in the transaction for a total demand that reached **EUR 40 billion**, with a significant participation of ESG (*Environmental, Social and Governance*) investors who subscribed more than half of the placement.

The **second issue** of the year was placed by auction, the first time for a **BTP Green**, at which a nominal **EUR 2 billion** was allocated against a demand of over EUR 3 billion. The bond was placed at an allotment price of 97.88, corresponding to a 4.26% gross annual yield.

As a continuation of last year, this Report illustrates the allocation of the proceeds of these issues made in adherence to the criteria set out in the **BTP Green Bond Framework (GBF)** published on 25 February 2021.

The sums collected were therefore allocated to the expenditures of the State budget in the **four-year period 2019-2022** concerning the **six categories** indicated in the **GBF**:

1. *Renewable sources for electricity and heat production;*
2. *Energy efficiency;*
3. *Transport;*
4. *Pollution prevention and control and circular economy;*
5. *Protection of the environment and biological diversity;*
6. *Research.*

Also, for this Report, the process of selecting eligible expenditures for the issue of **BTP Green** originates from an analysis of the State budget aimed at identifying the expenditure whose characteristics suggest the possibility of positive environmental effects. The items thus determined are then checked by cross-referencing the economic classification with the COFOG classification (*International Classification of Public Expenditure by Function*) by mission, programme, centre of responsibility and action.

The supervision of the process of identifying and collecting eligible data for green issues by the **Interministerial Committee for the monitoring and publication of the information necessary for the issue of government green bonds** (from now on the 'Committee') established by the Prime Ministerial Decree of 9 October 2020, is confirmed, in compliance with the provisions of the Stability Law for 2020 (Law No. 160 of 27 December 2019)⁶.

The Ministries participating in the Committee cooperate with the **structure of the Treasury Department** at the Ministry of Economy and Finance to ensure the traceability of the expenses and the monitoring of the sums disbursed also through the activation of the necessary institutional collaborations.

The Committee's administrations also ensure the stability of interventions with a positive environmental impact financed from the State budget. This information flow ensures the reporting of the actual use of the sums and the monitoring of the environmental impact of the uses indicated in the **GBF**.

⁶ https://www.dt.mef.gov.it/it/dipartimento/comitati/comitato_btp_green/y

Where necessary, the detail contained within the public accounts reported by the State General Accounting Office was supplemented with additional information - both qualitative and quantitative - transmitted by the Ministries responsible for those expenditures and collected within the Committee.

Having ascertained the congruence between the expenditure item and the purposes of the ICMA bond principles, in light of the information gathered, the representatives of the Ministries that make up the Committee were asked: *i)* to verify that the expenditure item met the environmental purposes pursued; *ii)* to ascertain that there were no direct financing channels for those items (to avoid any possibility of duplication with the proceeds of the issue of **BTP Green**), *iii)* to timely monitor the expenditure path and the actual use of the sums for the purposes envisaged.

The approach entails that the proceeds will be used exclusively for expenditures already made in the year the bond is issued (2022) and in the three preceding years (2019-2021).



RELEVANT ACTIVITIES ACCORDING TO EUROPEAN TAXONOMY

In the expectation of the entry into force of the new **European Green Bond Standard (EuGBS)** and to provide investors with the best possible information also concerning the recent new provisions in the EU regulation on sustainable finance⁷, an initial simplified application exercise of the EU Taxonomy (EU Regulation 2020/852 and subsequent delegated acts) was launched, already within the scope of this Report, aimed at **assessing the traceability of expenses allocated to the economic activities classified as potentially environmentally sustainable** under the scope of

the EU Taxonomy.

In this regard, in line with the gradual implementation of the regulation adopted by the European Commission, this Report includes a section dedicated to assessing whether the measures allocated in the 2019-2022 four-year period fall within the list of «**relevant**» economic activities for the EU Taxonomy, i.e., **potentially eco-sustainable** and capable of contributing to the achievement of the objectives of the *European Green Deal*.

Following a **multi-level approach**, the exercise of assessing allocated expenditure items against the objectives of the EU Taxonomy was based on the following:

- the economic activities mapped by the European Commission's **Taxonomy Compass** limited to **the first two objectives of the EU Taxonomy** (*climate change mitigation and adaptation*), for which the technical screening criteria are - as of today – published under the 2021 Climate delegated Act and net of the sectors added by the April 2023 amendment proposal;
- the economic activities identified in the draft Environment Delegated Regulation and its technical screening criteria, put out for consultation by the European Commission in April 2023, referring to the **remaining four objectives of the EU Taxonomy** (*sustainable use and protection of water and marine resources, transition to a circular economy, prevention and reduction of pollution and protection and restoration of biodiversity and ecosystems*);
- the possible connection of allocated economic activities, aggregated by homogeneous expenditure macro categories for environmental purposes, according to a **broad interpretation**, to the objectives of the EU Taxonomy taking into account relevant reports and research in the field.

⁷ In particular, by the *Sustainable Finance Disclosure Regulation (SFDR)*, which requires investors to provide additional classifications and disclosures on certain indicators, including disclosing the alignment to the EU Taxonomy for certain fund categories (*promoting Sustainability and dedicated Green*).



2018-2021 ALLOCATION REVIEW

As it is well known, the green transition is one of the pillars of the European Union's **Recovery and Resilience Facility** (RRF), which has been in force since 19 February 2021. In particular, this facility allows Member States to use European resources also to finance reform and investment programmes which facilitate the transition to environmental sustainability to be achieved by December 2026. Regulation (EU)2021/241, which established the RRF, also introduced a retroactive project

identification mechanism, according to which each Member State is allowed to consider eligible for financing under the RRF, measures and investments started on or after 1 February 2020. For this reason, great care was taken from the outset to **avoid overlaps**, particularly with this funding channel.

However, after the publication of the previous **2022 Allocation and Impact Report** referring to the issue of **Green BTPs** in 2021, it became clear that the mismatch between the timing of the disbursement of European resources (only occurring once the projects are completed) and the reporting on the use of the proceeds raised through the Green Bonds issues (occurring annually) may lead *ex-post* to overlaps even on investments expensed from the state budget in 2020 and 2021 and included in the 2022 Report.

This awareness made it necessary to revise the allocation of expenditures already reported in the 2022 Report and related to the proceeds collected in 2021 through the two tranches of the **BTP Green 2045**. In detail, on a prudential basis, the revision mainly concerned the expenditure items allocated in the 2020-2021 period and referred to measures and projects potentially exposed to overlapping. The expenditure items thus identified were replaced with other items of the State budget eligible for green issues and included in the broad portfolio of potentially eco-sustainable expenditures in line with the United Nations Sustainable Development Goals (SDGs) in adherence to the **Green Bond Principles** (GBP) issued by ICMA.

At the same time, the verification of the investment expenditures still potentially eligible for financing from European resources was strengthened and prudentially, investments that, although not already included, had such characteristics were set aside.



ALLOCATION AND IMPACT REPORT 2023

The first part of this Report provides explicit details of the revised allocation of expenditures already indicated in the 2022 Report, illustrating in the relevant allocation table the distribution of resources concerning the six environmental categories, as defined in the **GBF**, in the period 2018-2021 (**Chapter 1**).

Chapter 2 of the Report presents the details of the allocation of proceeds raised with the 2022 government green bond issues, which, again, took place in line with the UN SDGs in adherence to the **GBP** issued by ICMA.

The description of the expenditures allocation concerning the six categories to improve environmental conditions (defined in the **GBF**) is presented in **Chapters 3-8**. The detailed analysis of *green* programmes and projects is made according to their financial nature (tax expenses, capital expenditures and current expenditures), to their allocation over the four-year period 2019-2022, and to their relative weight in the allocated total.

Because of the future entry into force of the new **EuGBS** and also the willingness to provide investors with a complete information also on the EU regulation on sustainable finance as defined by the **EU Taxonomy**, **Chapter 9** presents a first simplified application exercise of the EU Taxonomy, aimed at assessing the traceability of expenses allocated to economic activities classified as potentially environmentally sustainable under the scope of the EU Taxonomy.

Part Two of the Report presents the methodology, the underlying assumptions and the results of the environmental impact assessments of the **BTP Green 2035** emissions-funded interventions and measures, as well as context analyses in cases where the complexity of the intervention did not allow for precise

quantification of the environmental impact. More specifically, the analyses and impact assessments are presented according to homogeneous purposes such as energy transition and sustainable building (**Chapter 10**); adaptation to climate change (**Chapter 11**); sustainable mobility (**Chapter 12**); sustainable use and protection of water resources (**Chapter 13**); pollution prevention and control and circular economy (**Chapter 14**); protection of biodiversity and ecosystems' health (**Chapter 15**) and research (**Chapter 16**).

Milestones

**Dec
2019**
2020 Budget Law (Italian Law No. 160 of 27 December 2019)

The issue of green government bonds is part of Italy's green new deal strategy. The Budget Law also provides for the establishment of an Interministerial Committee to support the Department of Treasury in the selection, monitoring and reporting of green expenditure.

**Nov
2020**
Establishment of the Interministerial Committee for Green Government Bond

set up by the Italian Prime Ministerial Degree of 9 October 2020

**Feb
2021**
Pubblication of the Italian Sovereign Green Bond Framework and the Second Party Opinion
**Mar
2021**
First issue of April 2045 BTP Green
(EUR 8,5 billion)

**Sep
2021**
Identification and disclosure to the market of eligible expenditures for Green government bond issues for 2018-2021
**Oct
2021**
Reopening of the April 2045 BTP Green
(EUR 5 billion)

**May
2022**
Pubblication of the first
Allocation and Impact Report | 2022
**Sep
2022**
Identification and disclosure to the market of eligible expenditures for Green government bond issues for 2019-2022
**Sep
2022**
Issuance of the new 2035 April BTP Green
(EUR 6 billion)

**Nov
2022**
First reopening of the April 2'35 BTP Green
(EUR 2 billion)

**Jun
2023**
Pubblication of the second
Allocation and Impact Report | 2023

Part I: Resource allocation



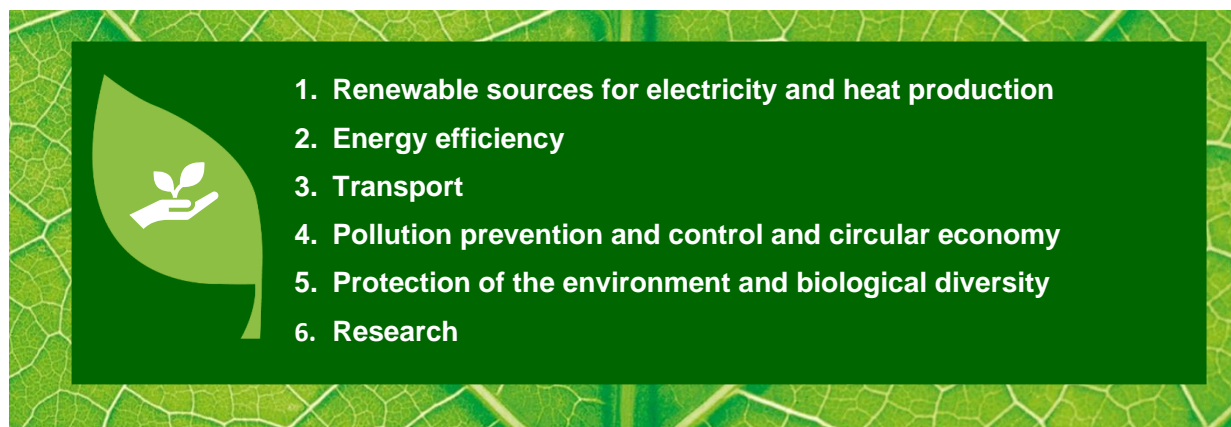
BTP GREEN: ALLOCATION OF PROCEEDS

This section illustrates the distribution of the proceeds raised from **BTP Green** issues concerning the **six categories of green** expenditures incurred by the Italian State, drawn up based on the environmental objectives expressed by the European Taxonomy of Sustainable Activities⁸ and indicated in the **GBF** published on 25 February 2021.

It should be pointed out that the eligible expenditures include tax expenditures, capital expenditures, current expenditures and transfers (e.g. subsidies) in favour of entities outside or within the public administration insofar as they are financed from general taxation and contribute to achieving the environmental objectives outlined in the European Taxonomy of Sustainable Activities.

Expenditures for which the Italian State has specifically dedicated forms of revenue or financing are not considered eligible. In particular, after dialogues with the competent Ministries, the budget chapters - or part of them - which are fed with resources deriving from EU resources, including the RRF have been excluded, thus avoiding the phenomenon of the so-called **double counting**. The chapters, in whole or in part, for which potential criticalities in monitoring and reporting have been identified have also been excluded.

It is also specified that the net proceeds of government *green* bond issues can be allocated to public agencies, public and private enterprises, local authorities, educational and research institutions, and households.



⁸ EU Regulation 2020/852 of 18 June 2020 as amended and supplemented.

1 Allocation review 2018-2021 (2045 BTP Green issues)



As a result of the process of punctually identifying the projects financed with resources attributable to the *Next Generation EU* (NGEU) or that have a high probability of being included in it, it became necessary to **review the allocation of the expenses included in the 2022 Report**⁹ and referred to the proceeds collected in 2021 through the two *tranches* of the **BTP Green 2045**, for a nominal value of **EUR 13.5 billion**. **Regulation (EU)2021/241**¹⁰ indeed established a retroactive project identification mechanism, according to which each Member State is allowed to consider measures and investments started as of 1 February 2020 in their National Recovery and Resilience Plans (NRRP).

For this reason, the revision mainly concerned those items of expenditure allocated in the 2020-2021 period and referred to projects that, although financed with resources from the State budget in the years 2020 and 2021, could result in an incoming flow - of equal value - into the State budget, if definitively approved by the European Commission. Therefore, as a matter of prudence, to **avoid any possible duplication**, these expenditures were substituted with other eligible budget items included in the broad portfolio identified to replace the previous projects.

Specifically, the most significant adjustments were made in the **transport** sector, whose overall total in the four-year period 2018-2021 was increased by **EUR 838 million**, further augmenting its weight in the overall allocation (from 57% to 62.5%). However, some downward adjustments also had to be made within it, some of which were predominantly made on the **interventions for rapid mass transport** in the years 2020 and 2021, where the impact of the absorption by the NRRP (share financed by European resources) was particularly strong. The recovery of resources spilt over onto the sub-category of **expenditures and contributions for railway infrastructures and HS/HC lines**, with a prevalent increase in favour of the year 2018 and some redistributive adjustments on the other three years, necessary to replace the financing of some railway sections that also entered the NRRP with other expenses that remained in the national budget.

Category 5, which refers to the **protection of the environment and biological diversity**, was also heavily impacted by revisions that became necessary for the same reason, with an overall reduction in the four-year period of **EUR 543 million**, which reduced its weight in the total allocation from 15.2 to 11%. In this case, the revision was limited to subtracting certain investments in **water infrastructures and soil protection and interventions against hydrogeological instability** in 2020 and 2021. Also the reduction of those budget items was more than compensated by greater **investments in railway infrastructures and HS/HC lines** above mentioned.

Less significant revisions concerned Category 1 (**Renewable energy sources for electricity and heat production**) and Category 6 (**Research**), both exclusively for the year 2019 and of a similar amount (about **EUR 60 million**). In this case, the revision was due to material errors that duplicated a fiscal expenditure in the case of Category 1 and related to a specific budget chapter in the case of Category 6. The greater resources allocated to category 3 (**transport**) counterbalanced the reduction in expenses in categories 1 and 6.

⁹ Allocation and Impact Report 2022, available on: <https://www.mef.gov.it/ufficio-stampa/comunicati/2022/documenti/Rapporto-su-Allocazione-e-Impatto-BTP-Green-2022.pdf>.

¹⁰ Regulation (EU) 2021/241 of 12 February 2021 establishes the European Union Recovery and Resilience Facility, setting out the scope of the Facility, the objectives pursued, the modalities for financing the Facility, the forms of Union funding that can be provided under the Facility, and the rules for the disbursement of such funding.

Finally, Category 4 - related to the **prevention and control of pollution and circular economy** - underwent modest revisions due to reductions made for 2020 and 2021 and related to **water purification interventions**, which are also included among the expenditures that can be financed with the NRRP under the RRF. These reductions, however, were partially offset by the recovery for the year 2018 of some minor sums on other expenditure chapters, so that the overall impact on the category in the four-year period was limited to only **EUR 8.7 million**.

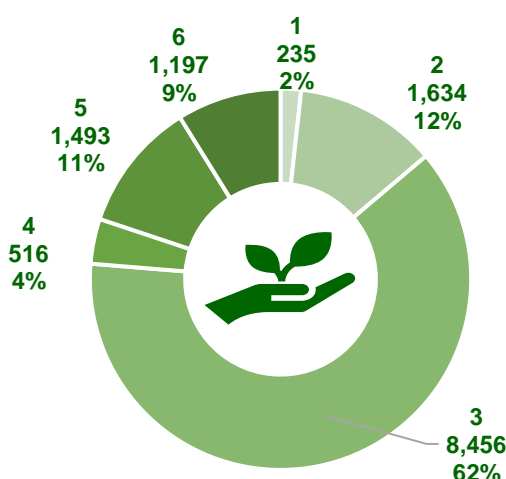
Given the reallocations illustrated above, the expenditures considered eligible, selected from the Italian State budget and related to the year of issue of the two *tranches* of the **BTP Green 2045**, i.e. the year 2021, and the three preceding years, i.e. 2018, 2019 and 2020, amount to **EUR 13.53 billion**, against **EUR 13.26 billion** in proceeds from the **BTP Green 2045** (Figure 1).

Figure 1: Green expenditures and net proceeds of 2045 BTP Green

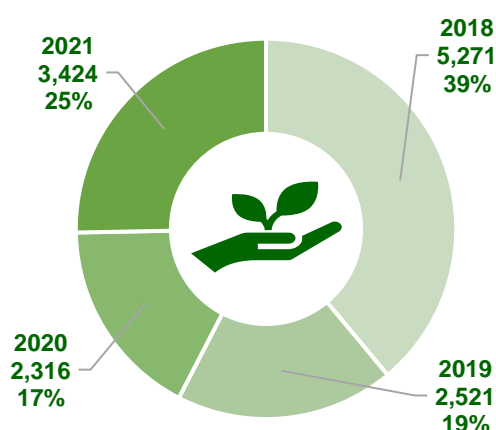


Figure 2: Allocation of green expenditures 2018-2021 (2045 BTP Green)

Breakdown by expenditure category



Breakdown of expenditure by year



Note: values expressed in EUR million.

Also following the reallocation of resources for the four-year period 2018-2021, the details of which are presented in Table 1, **Category 3** of **transport** is the main expenditure item with an amount of **EUR 8.46 billion** and a relative weight, compared to the total allocated resources, of **62.5%**. A large part of this

category is attributable to capital investments (railway infrastructures, electrification of railway lines, construction of new HS/HC lines) and to contributions in support of railway mobility (passengers and goods).

The **second** most significant item of expenditure is **Category 2**, related to **energy efficiency**, here represented by subsidies granted for spending incurred for energy-efficient upgrading of buildings. A share of **12.1%** of the total reported expenditure, i.e. **EUR 1.63 billion**, was allocated to this category.

Category 5, related to the **protection of the environment and biological diversity**, has been allocated resources amounting to **EUR 1.49 billion**, representing **11%** of the total expenditure over the four-year period 2018-2021. As a result of the allocation revision described above, the category primarily includes interventions to protect the soil and against hydrogeological instability; expenditures for the construction of the Experimental Electromechanical Module (MO.S.E.); investments in water infrastructures; and resources allocated to Marine Protected Areas (MPAs), Nature Parks (NPs), and State Nature Reserves (SNRs).

Considerable weight is reserved for **research Category 6** with **EUR 1.20 billion** of allocated resources, namely **8.8%** of the total allocated expenditure, of which the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) is the primary beneficiary.

Pollution prevention and control measures and circular economy (Category 4) and **incentive measures for the production of energy from renewable sources (Category 1)** make up, respectively, **3.8%** (or **EUR 516 million**) and **1.7%** (or **EUR 235 million**) of the total green expenditures reported in the four-year period 2018-2021.

The reallocation operation was carried out trying, as far as possible, to maintain a balanced distribution of resources also concerning the time horizon considered (2018-2021), with a greater weight for 2018 (**39.0%** of total spending) and for 2021 (**25.3%** of total spending).

It should be noted that, in some cases, the amount of certain categories or specific items of expenditure is allocated only with reference to the first years of the period considered, although disbursements are also made in the following years; in fact, as much balance as possible was maintained in the allocation among the various categories, a ratio that would have been compromised by including specific substantial amounts of expenditure for the entire four-year period. However, the following years' disbursements remained available for the subsequent **BTP Green** issues.






For further clarity, in Table 1 the changes, due to the revisions above mentioned, made in the allocation of the proceeds obtained from the issues of the **BTP Green 2045** are summarized. A comparison is made for all 6 categories of eligible expenses in the four year period 2018-2021 between the pre and post revision.

Table 1: Allocation of net proceeds 2018-2021 (2045 BTP Green)

Category description	2018	2019	2020	2021	Total	UN SDGs
Renewable sources for electricity and heat production	59,600	63,240	54,210	57,850	23,900	1
<i>Tax benefits for energy from renewable sources</i>	59,600	63,240	54,210	57,850	234,900	 
Energy efficiency	1,634,200	-	-	-	1,634,200	2
<i>Tax benefits for energy efficiency in buildings</i>	1,634,200	-	-	-	1,634,200	  
Transport	2,508,298	1,669,278	1,688,196	2,590,532	8,456,304	3
<i>Subways</i>	211,760	50,496	126,520	257,750	646,526	     
<i>Rail freight transport subsidies</i>	22,094	135,396	99,906	232,756	490,152	
<i>Interventions for rapid mass transport</i>	23,228	98,666	37,820	22,837	182,552	
<i>Expenditures and contributions for railway infrastructure and HS/ HC lines</i>	2,244,796	1,383,149	1,422,002	2,073,040	7,121,064	
<i>Padano-Veneto waterway system</i>	6,421	1,571	1,948	4,148	14,088	
Pollution prevention and control and circular economy	152,809	113,043	150,862	99,338	516,051	4
<i>Measures to combat marine and inland water pollution</i>	49,907	31,617	41,695	45,598	168,817	    
<i>Plan for environmental recovery and integrated waste cycle</i>	38,070	6,175	59,942	43,504	147,691	
<i>Water purification interventions</i>	55,392	75,236	49,225	10,236	190,089	
<i>Depollution and improvement of air quality</i>	9,002	15	-	-	9,017	
<i>International agreements to combat pollution and climate change</i>	437	-	-	-	437	
Protection of the environment and biological diversity	588,804	437,623	253,900	212,757	1,493,084	5
<i>MO.S.E. and safeguarding of the Venetian lagoon</i>	213,210	37,699	56,857	53,944	361,710	    
<i>Water infrastructures</i>	72,076	120,560	37,204	158,392	388,232	
<i>Protected Marine Areas, National Parks and State Nature Reserves</i>	83,319	76,352	72,868	421	232,961	
<i>Soil protection and interventions against hydrogeological instability</i>	166,660	203,012	86,971	-	456,643	
<i>Environmental protection, certification and protection of biodiversity</i>	739	-	-	-	739	
<i>International cooperation for environmental protection</i>	52,799	-	-	-	52,799	

Note: values expressed in EUR thousand.

Table 1 (continued): Allocation of net proceeds 2018-2021 (2045 BTP Green)

Category description	2018	2019	2020	2021	Totale	UN SDGs
Research	327,025	238,044	168,912	463,091	1,197,073	6
Contribution to the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)	211,133	214,025	141,181	453,328	1,019,666	    
Contribution to the Euro-Mediterranean Centre on Climate Change (CMCC)	5,000	5,000	5,000	-	15,000	
Contribution to European Centre for medium-range weather forecasts (ECMWF)	5,227	5,741	6,037	-	17,006	
Support for scientific and technological research in the Arctic and Antarctic	12,000	1,000	2,000	-	15,000	
ITER-DTT nuclear fusion project	-	-	10,000	-	10,000	
Sustainable development, pollution prevention and reduction	3,454	10,278	4,695	9,763	28,190	
Contribution to CNR-IRBIM: Anton Dohrn Zoological Station of Naples	-	2,000	-	-	2,000	
Contributions to the Institute for Environmental Protection and Research (ISPRA)	90,211	-	-	-	90,211	
Total categories	5,270,736	2,521,228	2,316,080	3,423,568	13,531,613	

Note: values expressed in EUR thousand.

Table 2: Summary of allocation review of green expenditures 2018-2021 (2045 BTP Green)

Category description	Allocation post-review	Allocation pre-review	Allocation change
1. Renewable sources for electricity and heat production	234,900	296,410	- 61,510
2. Energy efficiency	1,634,200	1,634,200	-
3. Transport	8,456,304	7,617,973	+ 838,331
4. Pollution prevention and control and circular economy	516,051	524,748	- 8,697
5. Protection of the environment and biological diversity	1,493,084	2,036,067	- 542,983
6. Research	1,197,073	1,251,379	- 54,306
Total categories	13,531,613	13,360,777	+ 170,836

Note: values expressed in EUR thousand.

2 Allocation 2019-2022 (2035 BTP Green issues)



The expenses considered eligible, selected from the Italian State budget and relating to the year of issue of the two *tranches* of the **BTP Green 2035**, i.e. the year 2022, and the three previous years, i.e. 2019, 2020 and 2021, amount to **EUR 8.10 billion**, against **EUR 7.94 billion** in proceeds from the **BTP Green 2035** (Figure 3).

Figure 3: Green expenditures and net proceeds of 2035 BTP Green

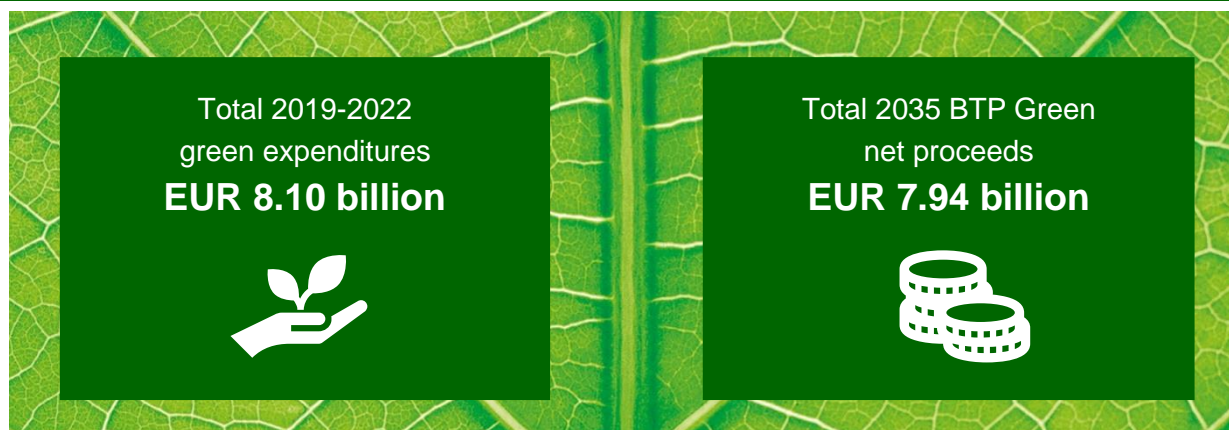
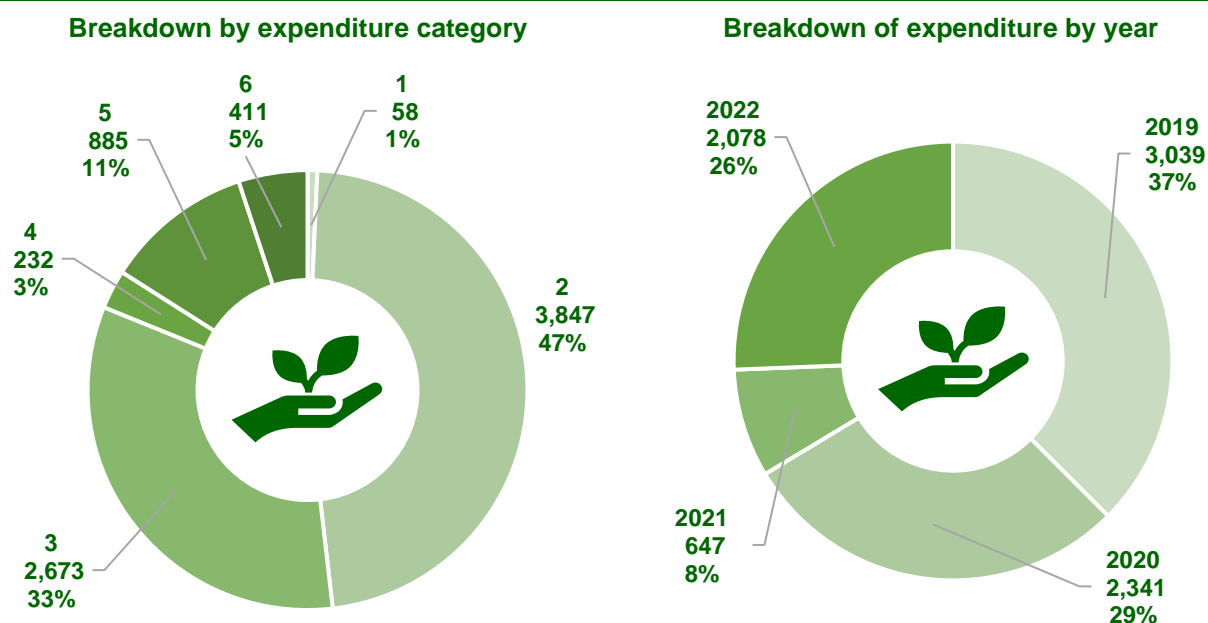


Figure 4: Allocation of green expenditures 2019-2022 (2035 BTP Green)



Note: values expressed in EUR million.

Of the total green expenditure indicated as eligible in Table 3 during the four-year period 2019-2022, **Category 2** concerning **energy efficiency measures** constitutes the main funded item with a share of **47.5%** of the total expenditure and an allocated amount of **EUR 3.85 billion**.

Transport Category 3 is the second largest expenditure item financed by government green bond issues (with an amount of **EUR 2.67 billion**) and accounts for **33%** of total expenditure. As reported in the last Allocation and Impact Report 2022, a large part of the expenditures allocated to Category 3 is attributable to capital investments (railway infrastructures, electrification of railway lines, construction of new HS/HC lines, subways), and contributions to support passenger and freight rail mobility.

The third largest category of expenditure is **Protection of the Environment and Biological Diversity (Category 5)**, to which **10.9%** of the total expenditure over the four-year period 2019-2022 (i.e. **EUR 885 million**) is allocated. Within Category 5, MPAs, NPs and SNRs are the primary recipients of funding. Significant resources were also allocated for constructing the MO.S.E., for investments in water infrastructures, and for programmes, projects and international agreements aimed at environmental protection.

To **Category 6**, which relates to **research**, was allocated sums of **EUR 411 million** in 2019-2022, accounting for **5.1%** of the total expenses raised by issuing **BTP Green** in 2022. The Italian Institute for Environmental Protection and Research (ISPRA) is the largest recipient of resources in this category.

Finally, **Category 4**, referring to **pollution prevention and control** measures and the **circular economy** and **Category 1**, referring to **incentives for the production of energy from renewable sources**, represent, respectively, **2.9%** (**EUR 232 million**) and **0.7%** (**EUR 58 million**) of the total *green* expenditure reported in the four-year period 2019-2022.

The temporal distribution of the expenditures was carried out in as balanced a manner as possible along the reported time horizon 2019-2022, with a greater weight attributed to the year 2019 (**37.5%** of total spending) and an underweight for the year 2021 (**8%** of total spending). The lower weight for the year 2021 is justified by the fact that, on the one hand, the years 2019 and 2020 are characterised by significant amounts relating to energy efficiency (Category 2) and, on the other hand, the year 2022 is affected by substantial capital investments in rail transport (Category 3). In addition, the portion of measures financed in 2021 has already been used significantly in the previous allocation, leaving less room for the present one.






Also for this allocation the amount of certain categories or specific expenditure items is allocated only with reference to the first years of the period considered. However, disbursements are also made in subsequent years. This approach has been adopted to maintain as much as possible a balance in the allocation between the different categories, a ratio that would have been compromised by including some particularly relevant expenditure items for the entire four-year period. The related disbursements will be considered in future **BTP Green** issues.

Table 3: Allocation of net proceeds 2019-2022 (2035 BTP Green)

Category description	2019	2020	2021	2022	Totale	UN SDGs
Renewable sources for electricity and heat production	-	-	-	57,850	57,850	1
<i>Tax benefits for energy from renewable sources</i>	-	-	-	57,850	57,850	 
Energy efficiency	1,828,900	2,017,700	-	-	3,846,600	2
<i>Tax benefits for energy efficiency in buildings</i>	1,828,900	2,017,700	-	-	3,846,600	  
Transport	1,058,033	26,205	215,413	1,373,671	2,673,323	3
<i>Subways</i>	4,648	26,205	58,968	244,287	334,109	 
<i>Rail freight transport subsidies</i>	-	-	-	160,597	160,597	 
<i>Interventions for rapid mass transport</i>	-	-	-	-	-	 
<i>Expenditures and contributions for railway infrastructure and high speed (HS) / high capacity (HC) lines</i>	1,053,385	-	156,445	968,787	2,178,617	
Pollution prevention and control and circular economy	27,872	50,901	44,177	108,902	231,852	4
<i>Measures to combat marine and inland water pollution</i>	2,524	2,480	2,063	54,491	61,559	 
<i>Plan for environmental recovery and integrated waste cycle</i>	16,323	37,331	37,096	49,106	139,856	 
<i>Water purification interventions</i>	-	-	-	-	-	 
<i>Depollution and improvement of air quality</i>	8,711	7,114	600	871	17,297	
<i>International agreements to combat pollution and climate change</i>	313	3,976	4,418	4,434	13,140	
Protection of the environment and biological diversity	27,296	149,541	262,651	445,393	884,882	5
<i>MO.S.E. and safeguarding of the Venetian lagoon</i>	-	-	-	147,436	147,436	 
<i>Water infrastructures</i>	8,286	26,600	25,367	75,884	136,137	 
<i>Protected Marine Areas, National Parks and State Nature Reserves</i>	14,445	81,567	193,837	123,139	412,989	
<i>Soil protection and interventions against hydrogeological instability</i>	-	-	-	55,214	55,214	
<i>Environmental protection, certification and protection of biodiversity</i>	951	3,372	6,282	6,426	17,031	
<i>International cooperation for environmental protection</i>	3,614	38,001	37,165	37,294	116,075	

Note: values expressed in EUR thousand.

Table 3 (continued): Allocation of green expenditures 2019-2022 (2035 BTP Green)

Category description	2019	2020	2021	2022	Totale	UN SDGs
Research	97,037	96,897	125,252	91,806	410,993	6
Contribution to the Euro-Mediterranean Centre on Climate Change (CMCC)	-	-	7,000	7,000	14,000	    
Contribution to European Centre for medium-term weather forecasts (ECMWF)	2,115	-	5,720	6,516	14,352	
Support for scientific and technological research in the Arctic and Antarctic	-	1,000	1,018	20	2,039	
ITER-DTT nuclear fusion project	-	-	10,000	-	10,000	
Sustainable development, pollution prevention and reduction	413	473	501	575	1,961	
Contributions to the Institute for Environmental Protection and Research (ISPRA)	91,366	94,121	95,121	76,280	356,888	
Contribution to the Council for Agricultural Research and Analysis of the Agricultural Economy (CREA) and to the Institute for the Agricultural Food Market (ISMEA)	3,143	1,304	5,891	1,415	11,753	
Total categories	3,039,140	2,341,245	647,492	2,077,623	8,105,500	

Note: values expressed in EUR thousand.

CATEGORY

1

Renewable sources for electricity and heat production

Energy from renewable sources for business activity



3 Renewable sources for electricity and heat production

CATEGORY

1

Italy has long placed the development of renewable energy sources among the priorities of its energy policy, along with the promotion of energy efficiency. At the EU level, Directive 2009/28/EC (RED I)¹¹ on the promotion of the use of energy from renewable sources (FER) assigned to Italy the **national target**¹² of a RES share in the final gross consumption **of at least 17%** to be reached by 2020. The RED I Directive was subsequently amended by Directive 2018/2001/EU (RED II) which imposed new binding targets on Member States, to be achieved by 2030, as set out in their national integrated energy and climate plans¹³.

The Italian **National Energy and Climate Plan (PNIEC)**¹⁴, finalised in 2019, has therefore redefined the targets for renewables, envisaging a RES share in the final gross consumption of **30%** and specific trajectories to reach this percentage by 2030.

As shown in Figure 5, applying the calculation criteria set up in the RED I Directive, in 2020, the share of total gross final consumption covered by RES is **20.4%**. This is, therefore, higher than the 17% target assigned to Italy by Directive 2009/28/EC¹⁵. In 2021, applying the new calculation criteria imposed by the RED II Directive to monitor the EU objectives on RES for 2030, the share of final gross consumption covered by renewable sources is **equal to 19.03%**¹⁶, thus being lower than the trajectory envisaged by the PNIEC for 2021 (19.9%)¹⁷.

To face these new challenges, Italy is therefore called upon to increase its energy production capacity from renewable sources. In this context, numerous support mechanisms can ensure a return on investment in various renewable energy and energy efficiency sectors and foster the growth of industrial sectors. In particular, measures to support the production of electricity from plants powered by renewable sources include:

- **the exemption from payment of the excise duty** on electricity independently produced and self-consumed by companies;
- **the incentives mechanism** for newly built renewable energy power plants (such as “on-shore” wind, photovoltaic, hydroelectric, sewage process gas plants) and recognised based on the net produced electricity fed into the grid by the plant¹⁸.

¹¹ Directive transposed by Legislative Decree no. 28 of 3 March 2011.

¹² In fact, the RED I Directive has set two national targets to be reached by 2020: the first target envisages a RES share of gross final consumption of at least 17%; the second target, relating only to the transport sector, envisages a RES share of at least 10%.

¹³ Directive 2018/2001/EU (RED II) stipulated that Member States shall collectively ensure that in 2030 the share of energy from renewable sources in the Union's final gross energy consumption is at least 32% and the share of energy from renewable sources in transport is at least 14% of final energy consumption in this sector. The RED II Directive also introduced important changes for the statistical monitoring of RES from 2021 onwards by changing the scope of the items to be taken into account in the outline of the RED I Directive, extending it - for example - to the renewable energy provided by the summer use of heat pumps and to the way in which renewable energy sources in the transport sector are accounted for. For this reason, relevant variations between 2021 and previous years may be related to methodological aspects, as well as to the actual development of the phenomenon being measured.

¹⁴ https://www.mise.gov.it/images/stories/documenti/PNIEC_finale_17012020.pdf

¹⁵ Renewable Sources in Italy and the Regions - Monitoring Report 2012-2020 (Gestore Servizi Energetici - GSE).

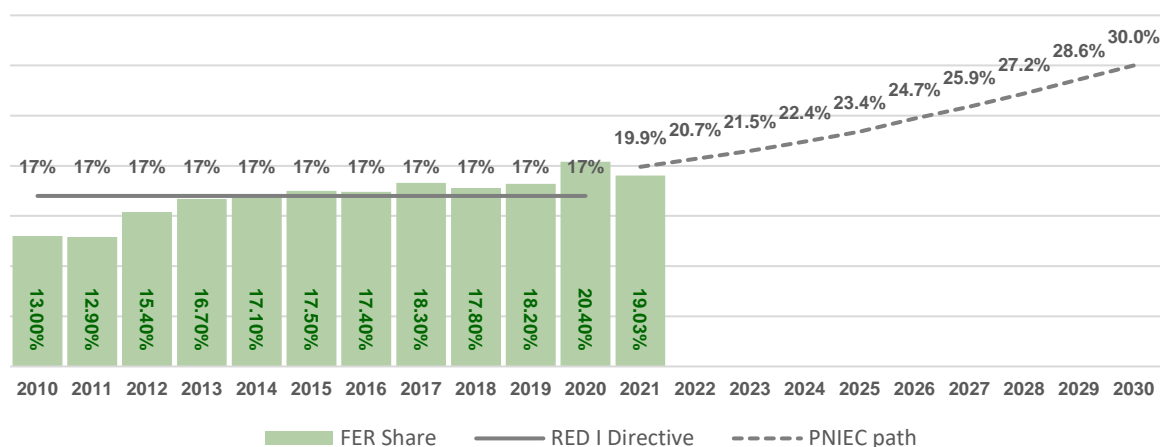
¹⁶ Applying the criteria set in RED II also for 2020, the same figure would be 20.25% (instead of 20.4% according to the criteria set by RED I).

¹⁷ Statistical Report 2021 - Energy from Renewable Sources in Italy (GSE, 2023).

¹⁸ The electricity produced is calculated as the lower value between net production (in turn equal to gross production reduced by consumption of auxiliary services, line and transformation losses) and the electricity fed into the grid, measured with the exchange meter.

Due to their use, the assets financed by these measures respect the threshold of 100 gCO₂ e/kWh set in the **GBF**.

Figure 5: Share of gross final energy consumption covered by FER and PNIEC target



Source: Elaboration on GSE data. The share of total gross final consumption covered by FER for the period 2010-2020 was calculated using the criteria established by RED I. For the year 2021, it used the criteria established by RED II.

In the period 2019-2022, only the above-mentioned measure of exemption from payment of the excise duty was taken into account for revenue allocation.

It should be noted that the proceeds collected in 2022 through the issuances of **BTP Green** have not been allocated to incentive measures for hydrogen production. Under the **GBF**, this possibility may relate to future government green bond issues.

Finally, the category excludes expenditures on energy production from high carbon stock land, land with high biodiversity value, and by conversion from forests and arable land.

Subcategories of eligible expenditure	2019	2020	2021	2022	Total
Tax benefits for energy from renewable sources	-	-	-	57,850	57,850
Incentives for hydrogen production	-	-	-	-	-

(values expressed in EUR thousand)

Two different incentive mechanisms are envisaged, depending on the power of the plant built: an all-inclusive tariff, consisting of a single tariff, corresponding to the incumbent tariff, which also remunerates the electricity withdrawn by the GSE; an incentive, calculated as the difference between the incumbent tariff and the hourly zonal energy price, as the energy produced remains at the operator's disposal. The all-inclusive tariffs and incentives are paid by the GSE from the date of commercial operation for a specific period for each type of plant equal to the useful life of the plant itself. The date of commercial operation can be chosen by the operator, as long as it is within 18 months from the entry into operation of the plant. Further information is available at: <https://www.gse.it/servizi-per-te/fonti-rinnovabili/fer-elettriche/incentivi-dm-04-07-2019>.

EU environmental objectives

1

CLIMATE CHANGE MITIGATION

2

CLIMATE CHANGE ADAPTATION

3

WATER AND MARINE RESOURCES

4

CIRCULAR ECONOMY

5

POLLUTION PREVENTION

6

HEALTHY ECOSYSTEM

UN Sustainable Development Goals

1

NO POVERTY

2

ZERO HUNGER

3

GOOD HEALTH AND WELL-BEING

4

QUALITY EDUCATION

5

GENDER EQUALITY

6

CLEAN WATER AND SANITATION

7

AFFORDABLE AND CLEAN ENERGY

8

DECENT WORK AND ECONOMIC GROWTH

9

INDUSTRY, INNOVATION AND INFRASTRUCTURE

10

REDUCED INEQUALITIES

11

SUSTAINABLE CITIES AND COMMUNITIES

12

RESPONSIBLE CONSUMPTION AND PRODUCTION

13

CLIMATE ACTION

14

LIFE BELOW WATER

15

LIFE ON LAND

16

PEACE, JUSTICE AND STRONG INSTITUTIONS

17

PARTNERSHIPS FOR THE GOALS

Subcategories of eligible expenditure subject to allocation

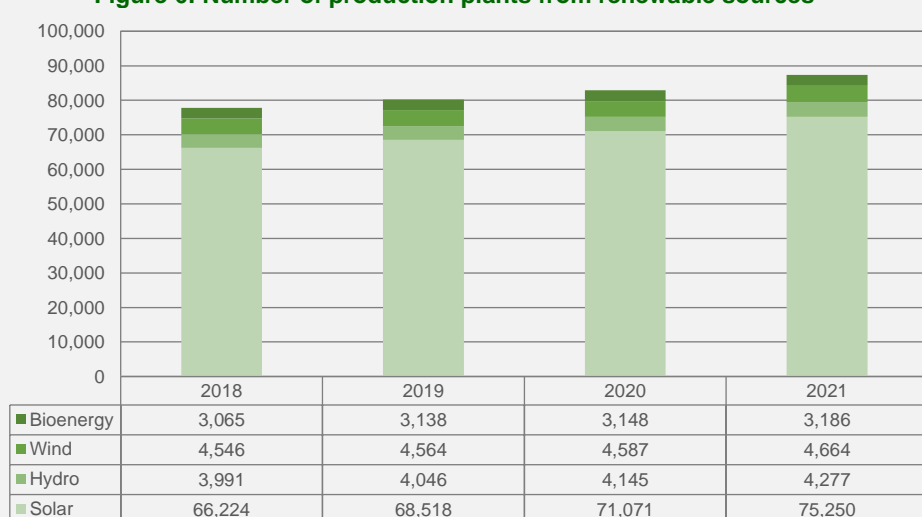
Expenditures aimed at developing renewable and other low-carbon energies such as solar, wind, wave, tidal or geothermal energy, hydropower produced in hydroelectric plants, generated from biomass or biomass products, and methane emitted from abandoned coal mines and fuel cells.

Tax benefits for energy from renewable sources

Resources earmarked for the exemption from payment of the excise duty for electricity produced by plants powered by renewable sources in accordance with current legislation¹⁹ on the subject, with available power greater than 20 kW, consumed by enterprises in self-generation in premises and places other than homes.

At the end of **2021**, there were **87,377** renewable energy power plants installed in Italy with an available power output of more than 20 kW (for an amount of electricity equal to 4,703,180,795 kWh), the majority of which (about 86%) were solar. The distribution by type of renewable source used is given below (Figure 6).

Figure 6: Number of production plants from renewable sources



	2018	2019	2020	2021
Bioenergy	3,065	3,138	3,148	3,186
Wind	4,546	4,564	4,587	4,664
Hydro	3,991	4,046	4,145	4,277
Solar	66,224	68,518	71,071	75,250

Note: Number of plants producing electricity from renewable sources, greater than 20 kW, operating in Italy in 2018. **Source:** Electricity Service Operator (GSE).

¹⁹ The rules for the application of excise duties on electricity are contained in Article 52 et seq. of the Consolidated Law on Excise Duties (TUA). The exemption considered herein is provided pursuant to Article 52(3)(B) of the TUA.

CATEGORY

2

Energy efficiency

Energy efficiency in residential buildings



4 Energy efficiency

CATEGORY

2

An objective of great importance for Italy is to make an extraordinary commitment to increasing energy efficiency and reducing energy consumption. Such a strategy will also make a decisive contribution to achieving the targets for reducing greenhouse gas emissions and expanding the coverage of total energy consumption by renewable sources.

The European *Green Deal* identified the renovation of public and private buildings as one of the critical interventions to promote energy efficiency in the building sector. Indeed, buildings account for a significant share of greenhouse gas (GHG) emissions, thus representing a **key sector to be decarbonised** to ensure emissions are reduced by at least 50% by 2030.

In pursuing this strategy, a crucial role is played by interventions aimed at supporting the renovation of existing residential and non-residential buildings, both public and private, to improve energy efficiency and achieve their gradual transformation into nearly zero-energy structures.

Among these measures, the **Ecobonus measure**²⁰ - an incentive measure for energy requalification interventions on the building stock - is financed through the proceeds collected from **BTP Green** issues.

It should be noted that this measure provided for disbursements throughout the 2019-2022 reporting period. However, to maintain a balance in the allocation among the different expenditure categories provided for in the **GBF**, when allocating the proceeds of the **BTP Green**, the amount of the **Ecobonus** was considered only for the years 2019 and 2020. Disbursements referring to the period 2021-2022 will, therefore, be taken into account in future issues.



Finally, the revenues reported here have not been earmarked for the implementation of smart grids aimed at managing increased renewable energy production, for the prevention of gas leakage SF₆ and the implementation of heating networks with a minimum 50% renewable energy requirement. According to the **GBF**, these expenditure items can be financed by future issues of government green bonds.

²⁰ The Ecobonus benefit consists of the tax deduction of a percentage of the expenses incurred and borne by the taxpayer to be repaid in several equal annual instalments. Currently, the deduction is to be spread over 10 years. Over time, the measure has undergone various changes that have affected the type of interventions allowed, the number of years over which the deduction is to be spread, the deduction rate, which has also varied by type of intervention, and has been more successful with simpler interventions carried out on individual property units, such as the replacement of windows and doors and the substitution of heat generators with more efficient ones (condensation boilers and heat pumps). To overcome this critical issue, the most recent legislative updates have sought to favour interventions on the common parts of condominium buildings as much as possible by raising the deduction percentage up to 75%, and up to 85% in the case of joint execution with interventions to reduce seismic risk by two classes. The measure can be used in all buildings of any cadastral category and by all taxpayers (individuals and companies). The Budget Law 2022 extended the application to expenses incurred by 31 December 2024.

As detailed in the section assessing the environmental impact of green projects, the Ecobonus measure produced significant results in terms of energy savings and tonnes of CO₂ avoided. It should be noted that the Ecobonus measure does not include, among the minimum criteria for admission to the deduction, the improvement of at least two levels on the Italian energy efficiency scale. This reference - indicated in the **GBF** - only concerns the measure for the energy requalification of the Italian building stock called Superbonus 110%, which was subsequently decided to be financed under the RRF and consequently was not considered when allocating the proceeds of the BTP Green.

Subcategories of eligible expenditure	2019	2020	2021	2022	Totale
Tax benefits for energy efficiency in buildings	1,828,900	2,017,700	-	-	3,846,600
Smart grids for energy management	-	-	-	-	-
Gas leakage prevention measures SF ₆	-	-	-	-	-

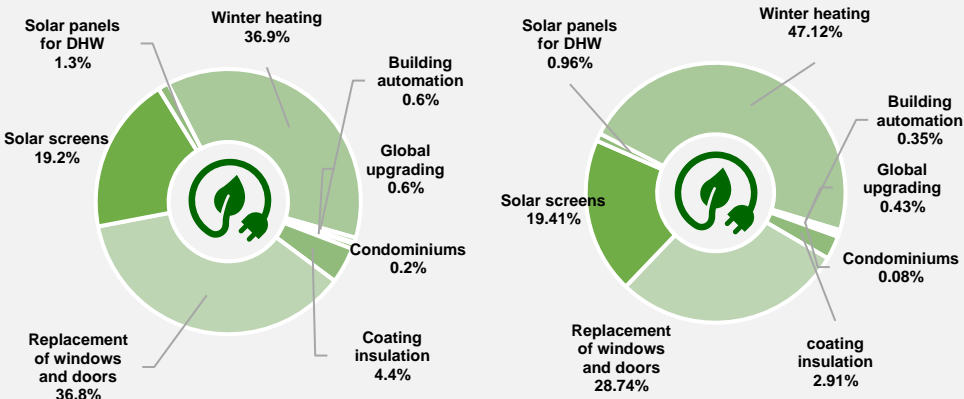
(values expressed in EUR thousand)

EU environmental objectives	
UN Sustainable Development Goals	
Subcategories of eligible expenditure subject to allocation	<p>Tax expenses incurred for energy requalification interventions in buildings of any cadastral category is aimed at increasing the efficiency of existing buildings and the diffusion of requalification interventions also through innovative technologies. The thresholds established by the law²¹ apply when selecting expenditures on the energy efficiency of buildings²².</p> <p>Tax incentives for energy efficiency in buildings</p> <p>Resources are earmarked for the granting of tax deductions for expenditures on energy requalification of Italy's building stock, the Ecobonus measure. This measure incentivises, among others, the following interventions:</p> <ul style="list-style-type: none"> ▪ global energy requalification; ▪ envelope insulation; ▪ replacement of windows and doors; ▪ solar shading; ▪ solar panels for the production of domestic hot water (DHW); ▪ winter air-conditioning; ▪ installation of building automation systems. <p>Access to the deduction is conditional on the drawing up of a certificate – Energy Performance Certificate (A.P.E.) – certifying the improvements made. Figure 7 shows the distribution of energy efficiency measures carried out in 2019 and 2020 financed with BTP Green.</p>

²¹ <https://www.efficientzaenergetica.enea.it/media/attachments/2020/06/19/d.-lgs-n.-48-del-10-giugno-2020.pdf>

²² https://www.mise.gov.it/images/stories/normativa/DM_Linee_guida_APE.pdf

Figure 7: 2019-2020 energy efficiency measures



Source: Elaboration on ENEA data.

CATEGORY

3

Transport



Palermo bypass: "Marisol" – Tunnel Boring Machine (TBM) for tunnel excavation

5 Transport

CATEGORY

3

Transforming infrastructures and the transport system to be more sustainable is indispensable to achieve the EU's greenhouse gas reduction targets set out in the new *Fit-for-55* climate package: reduction of greenhouse gas emissions by 55% compared to 1990 levels, to achieve carbon neutrality by 2050. In fact, mobility is one of the sectors that weighs the most in the global calculation of CO₂ emissions, contributing to more than 25% of total national greenhouse gas emissions, 90% of which comes from road transport²³.

Infrastructure and sustainable mobility are at the basis of the desired transition toward just and environmentally responsible growth scenarios.

Therefore, the most effective action to reduce the sector's impact is to increase the share of environmentally high-performing trips (so-called **modal shift in transport**), such as rail transport, accompanied by energy efficiency improvements to increase the use of low-emission energies.

The Italian State pursues these objectives through significant interventions, in both quantitative and qualitative terms, mainly referable to:

- **Investments** in the **expansion and improvement of the railway network**, aimed at reducing greenhouse gas emissions and continuing along the path of decarbonisation and ecological transition, an approach in which railway transport plays a central role;
- the **expansion of public transport** to reduce the use of individual vehicles and, consequently, air pollution, particularly in cities, due to the emission of CO₂ and other harmful gases and fine dust;
- the **reduction of the share of road freight transport**, mainly through investments and/or compensation mechanisms in favour of companies operating in the freight transport service.

The proceeds collected through the issuances of **BTP Green** have supported the above mentioned areas of intervention by allocating specific resources to capital investments of railway lines (both HS/HC and non HS/HC) and of subway lines, and measures to support railway mobility for passengers and freight in the four-year period 2019-2022.

In particular, all investments in railway transport infrastructure²⁴ reported here are to be considered eligible activities under the **European Taxonomy** (Reg. (EU) 2020/852 et seq.), due to their substantial contribution to mitigation and adaptation objectives, in compliance with the principle of do no significant harm to the environmental objectives (DNSH) and minimum safeguards.

Finally, it should be noted that the proceeds reported here have not been earmarked for incentives for purchasing hybrid or electric cars by individuals or companies, nor expenses related to maritime transport. According to the **GBF**, these expenditure items can be financed by future issues of government green bonds.

²³ ISPRA 'Emissions from road transport in Italy', April 2021.

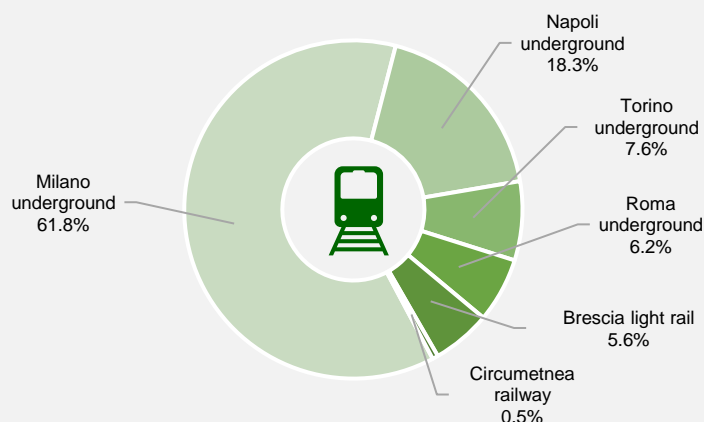
²⁴ This includes the construction, modernisation, operation and maintenance of railways and underground railways, as well as bridges and tunnels, stations, terminals, railway service facilities and traffic and safety management systems, including the provision of architectural, engineering, project drafting, construction inspection and surveying and similar services, as well as the performance of physical, chemical or other analytical testing of all types of materials and products. These activities are in fact included in the Climate Act (Delegated Regulation (EU) No. 2021/2139), under item 6.14 'Rail transport infrastructure'.

Subcategories of eligible expenditure	2019	2020	2021	2022	Total
Subways	4,648	26,205	58,968	244,287	334,109
Rail freight transport subsidies	-	-	-	160,597	160,597
Interventions for rapid mass transport	-	-	-	-	-
Expenditure and contributions for railway infrastructure and HS/HC lines	1,053,385	-	156,445	968,787	2,178,617
Incentives for the purchase of hybrid or electric cars by private individuals or companies	-	-	-	-	-
Maritime transport costs	-	-	-	-	-

(values expressed in EUR thousand)

EU environmental objectives																	
UN Sustainable Development Goals																	
Subcategories of eligible expenditure subject to allocation	<p>Subways:</p> <p>Resources earmarked for the construction and expansion of subway lines to promote public mobility in urban areas, thereby improving the overall performance of public transport through a modal diversion from private vehicles (private cars) to public transportation, with benefits in terms of atmospheric pollutant emissions. In particular, the proceeds collected through the issuances of BTP Green were allocated to expenses incurred in the period 2019-2022 and mainly related to the following interventions:</p> <ul style="list-style-type: none">▪ Milan Subway – Line M1, M3, M4 and M5;▪ Naples Subway – Line 1;▪ Turin Subway – Line 1;▪ Rome Subway – Line C;▪ Brescia Light Railway;▪ Catania Subway – Circumetnea Railway. <p>Figure 8 shows the distribution of resources for investment in subways allocated in 2019-2022.</p>																

Figure 8: 2019-2022 investment in subways



Source: Elaboration on MIT data. **Note:** Distribution of resources allocated in the period 2019-2022.

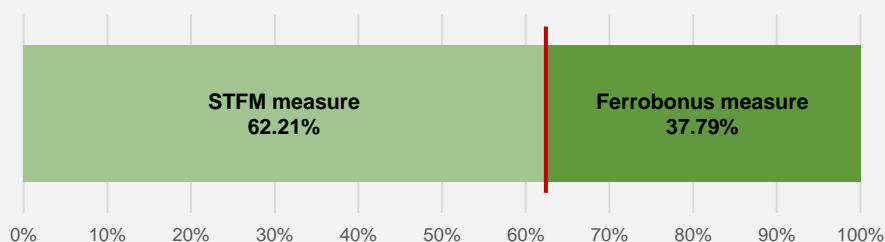
Rail freight transport subsidies:

Resources earmarked for granting subsidies to railway companies to provide incentives for rail freight transport compared to more polluting competing modes of transportation. In detail, in continuity with past allocations, the measures funded in 2019-2022 were as follows.

- **Support measure for rail freight traffic (STFM measure).** This measure provides for a compensation mechanism, in favour of companies operating in the freight transport service, for the additional costs incurred for the use of the railway infrastructure in certain areas of the country (southern regions) and for an environmental contribution over the entire national territory for the external costs that the railway mode saves compared to competing and more polluting means.
- **“Ferrobonus” measure.** It aims to shift freight traffic from the road to the rail network by favouring intermodal transport and transshipment to and from logistic hubs through an economic incentive aimed at railway services contracting companies and at multimodal railway operators.

Figure 9 shows the distribution of resources allocated to the different forms of rail freight subsidies in the 2019-2022 reporting period.

Figure 9: 2019-2022 Support measures for rail freight transport



Source: Elaboration on MIT data. **Nota:** Distribution of resources allocated in the period 2019-2022.

Both interventions are aimed at favouring the diversion of freight traffic from the road network to the rail network. Since freight railway traffic in Italy mainly relies on electrified railway lines, it is reasonable to consider that the eligibility criterion expressed in the **GBF** for this type of intervention is respected, such that the emissions per tonne-kilometre (gCO₂ e/t.km) for goods trains must be less than 50% of the reference average indicated in the “CO Regulation₂ Heavy Duty”.

Expenditures and contributions for railway infrastructure and HS/HC lines:

The allocation of the proceeds collected through the BTP Green issuances, referring to the expenditure sub-category and contributions for railway infrastructure and HS/HC lines, mainly concerned:

- capital expenditures and contributions for the **improvement of the national railway infrastructure**, including through **investments in the HS/HC network**, such as to allow a significant reduction in journey times, producing a significant modal shift from other modes of transport, such as road and air, for both passenger and freight transport;
- capital expenditures for **ordinary and extraordinary maintenance of the railway infrastructures**, and other resources for service obligations and charges related to the activity of the network operator and deriving from adaptation to new standards, changes in sector regulations or requirements of the competent authorities in terms of safety (programmes aimed at limiting risks in tunnels, seismic areas and areas subject to hydrogeological instability, as well as environmental protection measures);
- investments dedicated to completing **the non-electrified part of the national railway network**.

Figure 10 shows the distribution of the resources allocated to railway infrastructure in the 2019-2022 reporting period, divided by macro-category of intervention.

Figure 10: 2019-2022 expenditures and contributions for railway infrastructure



Source: Elaboration on RFI data. **Note:** Distribution of resources allocated in the period 2019-2022.

CATEGORY

4

Pollution prevention and control and circular economy



6 Pollution prevention and control and circular economy

CATEGORY

4

The health and well-being of the population and the protection of the environment require a fair and inclusive green transition, with the long-term goal of living well within the limits of our planet²⁵. This goal cannot be achieved without an appropriate **pollution prevention and control** strategy and a **circular economy**. Indeed, a circular economy and the efficient use of resources represent an opportunity to modernise our economy, thus increasing the competitiveness of Italian products and manufacturing, and to improve the quality of the environment and reducing greenhouse gas emissions.

Despite the progress and positive trends highlighted in recent years on various fronts, there is still a clear need to provide further impetus to environmental protection and recovery measures and to make the transformation from the linear to the circular economic model even more effective and timely.

To this end, the proceeds collected through the issuances of **BTP Green** have been used to finance expenditures of the State budget, made in the four-year period 2019-2022, which can be grouped into four main strands:

- combating marine and inland water pollution;
- plans for environmental restoration and integrated waste cycle;
- combating air and soil pollution;
- international agreements to combat pollution and climate change.

Finally, it should be noted that this category does not include expenditures for financing incineration, waste-to-energy, desalination and landfill plants.

Subcategories of eligible expenditure	2019	2020	2021	2022	Total
Measures to combat marine and inland water pollution	2,524	2,480	2,063	54,491	61,559
Plan for environmental recovery and integrated waste cycle	16,323	37,331	37,096	49,106	139,856
Water purification interventions	-	-	-	-	-
Depollution and improvement of air quality	8,711	7,114	600	871	17,297
International agreements to combat pollution and climate change	313	3,976	4,418	4,434	13,140

(values expressed in EUR thousand)

²⁵ This is stated in the *8th European Environment Action Programme (EAP)*, adopted by the European Commission, which outlines a common environmental strategy until 2030. The six priority thematic objectives of the *8th EAP* cover the reduction of greenhouse gas emissions, adaptation to climate change, a regenerative growth model, the ambition to zero pollution, the protection and restoration of biodiversity and the reduction of key environmental and climate impacts related to production and consumption.

EU environmental objectives	
UN Sustainable Development Goals	
Subcategories of eligible expenditure subject to allocation	<p>Measures to combat marine and inland water pollution:</p> <ul style="list-style-type: none"> ▪ Marine anti-pollution activities against hydrocarbons and harmful toxic substances, mainly regulated by Law 979/1982 '<i>Provisions for the defence of the sea</i>', which provides for the activation at the national level of a system aimed at preventing and combating marine pollution, in compliance with the international conventions to which Italy adheres. ▪ Contribution to Italy's participation in the Barcelona Convention²⁶ on the protection of the Mediterranean Sea from pollution through the application of specific protocols²⁷ that give concrete expression to the principles set out in the same convention with regard to the various forms of pollution. ▪ Marine systems' monitoring programme aimed at achieving a good environmental status of the waters also through the environmental sustainability of the activities that insist on the marine environment, in implementation of Directive 2008/56/EC²⁸ (transposed in Italy with Legislative Decree No. 190/2010). Monitoring activities are aimed at: <i>i)</i> the initial assessment of the state of the marine environment, the impact of anthropogenic activities and the socio-economic aspects of the use of the marine environment and the costs of its degradation; <i>ii)</i> the verification of the achievement of the <i>Good Environmental Status</i>²⁹; <i>iii)</i> the determination of the relevant environmental targets; and <i>iv)</i> the development of monitoring programmes for the continuous assessment of the environmental status of marine waters, according to the targets adopted. The projects are implemented through operational agreements between the Ministry of the Environment and Energy Security, the Italian Institute for Environmental Protection and Research (ISPRA) and the Regional Agencies for Environmental Protection (ARPA). ▪ Costs arising from the Convention between Italy and Switzerland concerning the protection of Italian-Swiss surface and groundwater from pollution or any other alteration of water³⁰ with particular regard to Lake Maggiore (Verbano), Lake Lugano (Ceresio) and the watercourses that mark or cross the border. <p>Plan for environmental recovery and integrated waste cycle:</p> <ul style="list-style-type: none"> ▪ Remediation of asbestos-contaminated public buildings. The financing is aimed at the preliminary and final design of interventions for the reclamation of asbestos-contaminated public buildings³¹. The interventions concern removing and disposing of asbestos and cement-asbestos products employed in public buildings and structures, according to specific priority criteria, to protect health and the environment.

²⁶ Convention ratified by Law 30/1979. It was amended by the neighbouring countries in 1995 to become the "Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean" and broadened its geographical scope to include inland marine waters of the Mediterranean and coastal areas.

²⁷ The Protocol on Specially Protected Areas and Biodiversity in the Mediterranean (SPAMI Protocol), for example, also takes into account protected and commercially exploited species; it also provides for the establishment of Special Protected Areas of Mediterranean Importance (SPAMI), with criteria that take into account the degree of actual biodiversity, the peculiarity of the habitat, and the presence of rare, threatened or endemic species.

²⁸ The Marine Strategy Framework Directive (MSFD) is an important governance tool for the marine system, promoting the adoption of complex strategies aimed at safeguarding the marine ecosystem to achieve *Good Environmental Status*.

²⁹ A "Good environmental status" (GES) of marine waters is defined as the ability to preserve the ecological diversity and vitality of the seas and oceans so that they are clean, healthy and productive while maintaining the use of the marine environment at a sustainable level and safeguarding its potential for the uses and activities of present and future generations (Article 3.5 of MSFD 2008/56/EC). GES is determined on the basis of 11 quality descriptors defined by the MSFD itself and available at: <http://www.strategiamarina.isprambiente.it/descrittori/i-descrittori-della-strategia-marina>.

³⁰ Convention signed in Rome on 20 April 1972.

³¹ Article 56(7) of Law No. 221/2015 (so-called 'connected environment').

- **“Mangiaplastica” experimental programme.** Provision of specific subsidies to municipalities for the purchase of eco-compactors - machines for the collection of PET beverage bottles - to reduce the volume of plastic waste and promote its recycling, with a view to the circular economy³².
- **Securing and remediating areas included in Sites of National Interest (S.I.N.)**³³.
- **Remediation of environmental orphan sites.** Expenditures for the recovery of potentially contaminated soil in abandoned industrial sites for which the polluter cannot be identified, giving the soil of these sites, so-called “orphan sites”, a new use and facilitating their reintegration into the real estate market, with a view to promoting the circular economy, pursuant to Ministerial Decree (MASE) No. 269/2020.
- **Expenses for supervision and control of integrated waste management** carried out under the Convention between the Ministry of the Environment and Energy Security (MASE) and ISPRA.

Measures to combat air and soil pollution:

- **Monitoring and control activities of industrial plants at risk of major accidents** carried out under Directive 2012/18/EU (known as ‘Seveso III’)³⁴. This activity involved approximately 1,000 establishments ‘at risk of major accidents’ present throughout the national territory and listed in the Inventory of establishments at risk of major accidents³⁵, coordinated by the MASE and prepared by ISPRA. The inspections carried out under the ‘Seveso III’ Directive in 2020 (latest available data) are just over 200 out of about 1,000 establishments, with an inspection rate of 21%³⁶.
- **Expenses for activities, studies and inspections aimed at issuing the integrated environmental authorisation (AIA-IPPC)**³⁷ carried out by the IPPC Investigation Commission. The Commission, established under Legislative Decree 152/2006, is composed of 23 experts with high legal and administrative qualifications. The Commission's task is to provide the competent authority by carrying out the necessary inspections and in good time for the issue of the integrated environmental authorisation, with a conclusive preliminary opinion and duly motivated intermediate opinions, as well as in-depth technical studies on each authorisation application.
- **Costs for implementing the REACH (Registration, Evaluation, Authorisation of Chemicals) Regulation**³⁸ concerning the registration, evaluation, authorisation and registration of chemicals produced in or imported into the EU in quantities greater than one tonne per year. More than ten years after it entered into force, the REACH Regulation has revealed significant results in increased safety in the use of chemicals for human health and the environment, estimated in the order of EUR 100 billion (over 25-30 years)³⁹. Specifically, the expenses financed by **BTP Green** refer to technical and scientific support activities carried out by ISPRA.

International agreements to combat pollution and climate change

- **Contribution resulting from Italy's participation in the European Plastic Pact (EURPP)**⁴⁰. The Pact aims to accelerate the reuse and recycling of plastics with innovative solutions for a faster transition to a circular economy. The Pact focuses on four key areas: i) circular design of plastic products and packaging; ii) responsible use of plastics; iii)

³² Ministerial Decree (MASE) No. 360/2021.

³³ <https://bonifichesiticontaminati.mite.gov.it/sin/inquadramento/>.

³⁴ Directive 2012/18/EU transposed into national law by Legislative Decree No. 105/2015. Further information is available at <https://www.mase.gov.it/pagina/la-direttiva-seveso-iii-decreto-legislativo-26-giugno-2015-ndeg105>.

³⁵ <https://www.rischioindustriale.isprambiente.gov.it/seveso-query-105/Default.php>.

³⁶ SNPA-AIA-RIR Environmental controls, monitoring and inspections report on 2020 data, SNPA Report No. 33/2020 (ISBN 978-88-448-1137-2).

³⁷ *Integrated Pollution Prevention and Control (IPPC)* is the European Union's strategy for integrated prevention and control of environmental pollution from industrial and agricultural activities with a high pollution potential (Directive 2010/75/EC). Specifically, the strategy includes measures to avoid, where possible, or reduce emissions to air, water and soil or reduce waste generation. These measures are identified on the basis of the *best available techniques (Best Available Technologies - BAT)* established under the same directive.

³⁸ Regulation (EC) No. 1907/2006 is implemented at the national level by the Ministry of Health Decree of 22 November 2007, which established the Plan of Activities and Use of Financial Resources. The Administrations involved in the implementation of the REACH Regulation on a national level are: the Ministry of Health as the competent authority, the Ministry of the Environment and Energy Safety, and the Ministry of Enterprises and Made in Italy. For technical and scientific support, the above Administrations make use of the ISPRA and the Higher Institute of Health.

³⁹ See the analyses and conclusions in Communication COM (2018) 116 of 5 March 2018.

⁴⁰ <https://europeanplasticspact.org/>.

recycling of plastics; iv) use of recycled plastics. By adhering to the Pact, governments commit to implementing policies in their countries that create an enabling environment by investing in waste collection and recycling infrastructure, providing supportive fiscal policies, and raising consumer awareness.

- **Contribution resulting from Italy's participation in the Basel Convention⁴¹ on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.** The aim of the convention is to reduce the movement of hazardous (non-radioactive) waste between nations and, in particular, to prevent the transfer of hazardous waste from developed (OECD) countries to developing countries. The convention also aims: to minimise the quantity and toxicity of waste generated; ensure an environmentally sound management as close as possible to the source of generation; and assist least developed countries in the environmentally sound management of hazardous waste.
- **Expenditure related to the implementation of the Paris Agreement⁴²,** under Ratification Act No. 204/2016. In particular, in the context of the 26th *Conference of the Parties* (COP-26) of the United Nations *Framework Convention on Climate Change* (UNFCCC), the initiative '*Youth4Climate: Driving Ambition*', organised by the Italian Government in partnership with the United Kingdom, was financed to address and discuss the main urgencies and priorities of climate action and sustainable development⁴³.
- **Contribution resulting from Italy's participation in the Concerted Programme for Monitoring and Evaluation of Long-range Transmission of Air Pollutants in Europe** (EMEP Protocol⁴⁴). This protocol constitutes an indispensable monitoring programme that forms the backbone of analysing and assessing European transboundary air pollution⁴⁵ in light of the agreements on reducing emissions⁴⁶.
- **Contribution to the project "Supporting the Western Balkan Region in implementation of Multilateral Environmental Agreements through Strengthening of Institutional Framework and Capacity Building".** The project aims to support the Western Balkans in the implementation of policies for the prevention, reduction and monitoring of pollution, starting from the promotion and strengthening of regional partnerships through the organisation of training courses, field visits, the establishment of a dedicated task force and the organisation of an inter-ministerial conference an integrated approach at the regional level will be promoted.

⁴¹ Concluded in Basel on 5 May 1989 and subsequently amended; entered into force on 5 March 1992. As of January 2015, 182 States and the European Union are parties to the Convention. More information is available at: <http://www.basel.int/>.

⁴² The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 countries at the United Nations Climate Change Conference (COP21) in Paris on 12 December 2015 and entered into force on 4 November 2016. The overall goal of the Agreement is to keep "the global average temperature increase well below 2°C above pre-industrial levels" and to continue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels".

⁴³ <https://www.mase.gov.it/pagina/youth4climate-driving-ambition-four-major-themes-center-discussion-among-young-protagonists>.

⁴⁴ <https://www.emep.int/>.

⁴⁵ Long-range transboundary air pollution is defined as the direct or indirect release, due to human activity, of substances into the air that have harmful effects on human health or the environment in another country and for which the contribution of emission sources or groups of sources cannot be distinguished.

⁴⁶ The reference framework of the EMEP Protocol is the Convention on Long-range Transboundary Air Pollution, signed in Geneva in 1979, which entered into force on 16 March 1983 and was ratified by Italy with Law 289/1982. Eight different protocols were developed under the Convention, including the EMEP Protocol.

CATEGORY

5

Protection of the environment and biological diversity

MO.S.E.: raising the barrier at the Chioggia hatchw
(Iconographic archives of the MIT - Interregional Measure for Public Works of Triveneto
Concessionario Consorzio Venezia Nuova)



7 Protection of the environment and biological diversity

CATEGORY

5

The fundamental importance of preserving and protecting biodiversity is one of the pillars of the European *Green Deal*.

Thanks to its geographical location in the centre of the Mediterranean basin, Italy holds a rich and valuable diversity of animal and plant species, subject to actual and pressing threats. Italy's biodiversity patrimony is among the most substantial in Europe, with a significant percentage of endemic species: 20% of the terrestrial and freshwater animal species and 16% of the vascular flora species present in Italy are endemic or sub-endemic⁴⁷.

To counter the decline in biodiversity, Italy has implemented important actions, first and foremost the establishment and management of **national and regional Protected Areas** and the **Rete Natura 2000**, in addition to the activities carried out in application of the European 'Birds' Directives 79/409/EEC (2009/147/EC) and 92/43/EEC (Habitats). Furthermore, the '**Parks for the Climate**' programme financed and approved 240 projects presented by the Park Authorities for actions aimed at adapting to climate change and pursuing the Agenda 2030 sustainable development goals.

Italy is firmly committed to the protection of biodiversity, including through the implementation of various global and regional multilateral agreements for the protection of species and habitats, particularly those that are threatened or endangered, such as the Bonn International Convention on Migratory Species (**CMS**), the Washington Convention on Trade in Endangered Species (**CITES**), the Bern Convention for the Protection of European Wildlife Species and Habitats, the Ramsar Convention on Wetlands of International Importance, and the Barcelona Convention for the Protection of the Mediterranean Sea from Pollution Risks.

The establishment of the experimental **Green Helmets for the Environment** programme is an innovative approach to providing specific financial resources in the three-year period 2020-2022.



As detailed below, the proceeds collected from **BTP Green** issues during 2022 support numerous initiatives aimed at **protecting the environment and biological diversity** crucial to reducing pollutant and greenhouse emissions and adapting to climate change.

Subcategories of eligible expenditure	2019	2020	2021	2022	Total
MO.S.E. and safeguarding of the Venetian lagoon	2,524	2,480	2,063	54,491	61,559
Water infrastructures	8,286	26,600	25,367	75,884	136,137
Protected Marine Areas, National Parks and State Nature Reserves	14,445	81,567	193,837	123,139	412,989
Soil protection and interventions against hydrogeological instability	-	-	-	55,214	55,214

⁴⁷ State of the Environment 2020 Report, Ministry of the Environment and Energy Security 2021.

Environmental protection, certification and protection of biodiversity	951	3,372	6,282	6,426	17,031
International cooperation for environmental protection	3,614	38,001	37,165	37,294	116,075

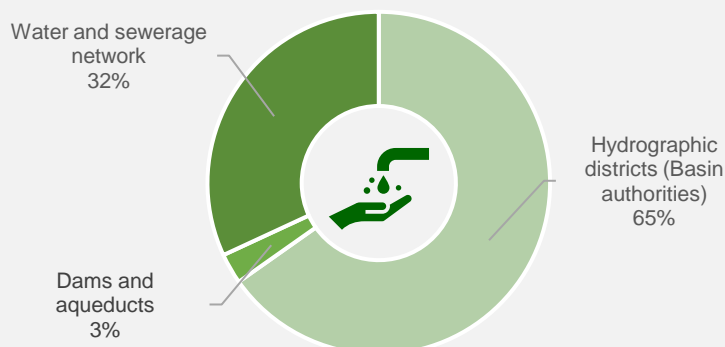
(values expressed in EUR thousand)

EU environmental objectives	
UN Sustainable Development Goals	
Subcategories of eligible expenditure subject to allocation	<p>MO.S.E. and safeguarding of the Venetian lagoon:</p> <p>The project to safeguard Venice, created to address and solve the environmental problems of the lagoon, includes:</p> <ul style="list-style-type: none"> interventions for the morphological recovery of the lagoon; interventions to halt degradation; interventions for defence against high waters; interventions to isolate the lagoon from the sea and thus achieve the complete defence of built-up areas from flooding. <p>These interventions aim to preserve the lagoon environment and have been designed in a unified and coordinated manner, adopting solutions that can contribute to improving the environment. Installing barriers seeks to isolate the lagoon from the sea in adverse marine weather situations. The solutions adopted result from numerous studies and research aimed at selecting the options most compatible with the surrounding environment. For each alternative, the effects on the lagoon and coastal hydraulics and morphology, water quality, existing ecosystems in the areas of intervention, commercial and industrial ports, fishing, recreation, emergency vessels, and safety and reliability of construction methods were examined. Innovative solutions were thus identified, with the choice of steel sluice gates hinged to the foundation structures, with flexibility and even partial closing.</p> <p>Water infrastructures:</p> <p>Expenditures earmarked for mitigation of damage related to the drought phenomenon and to promote the upgrading and adaptation of water infrastructures, also to increase the resilience of water systems to climate change and reduce the dispersion of water resources. In particular, in the four-year period considered 2019-2022, significant resources have been mainly allocated to the improvement and upgrading of the country's water infrastructure for the distribution of irrigation and drinking water, and this in the context of:</p> <ul style="list-style-type: none"> management of dams and aqueduct network reinforcement works; hydrological network and sewerage works; management and protection of water resources carried out based on water basins (river basin districts)⁴⁸ to carry out the functions of environmental and river asset enhancement, environmental monitoring, and flood and low-flow forecasting and management.

⁴⁸ One of the objectives of the Water Framework Directive (Directive 2000/60/EC) is to manage water resources on the basis of water basins independently of administrative structures (river basin district). A river basin district is defined as an area of land and sea and is made up of one or more neighbouring river basins and their groundwater and coastal waters. Art. 64 of Legislative Decree No.152/2006, later amended by Art. 51(5) of Law No. 221/2015 divided the national territory into 7 river basin districts: Eastern Alps (34,566 km²), Po River (82,700 km²), Northern Apennines (24,300 km²), Central Apennines (42,298 km²), Southern Apennines (67,459 km²), Sardinia (24,000 km²) and Sicily (26,000 km²). See also the link: <https://www.mase.gov.it/direttive/distretti-idrografici>.

Figure 11 shows the distribution by macro-category of intervention of the resources allocated to water infrastructure in the 2019-2022 reporting period.

Figure 11: 2019-2022 allocation resources in water infrastructures



Source: Elaboration on MIT data. **Note:** Distribution of resources allocated in the period 2019-2022.

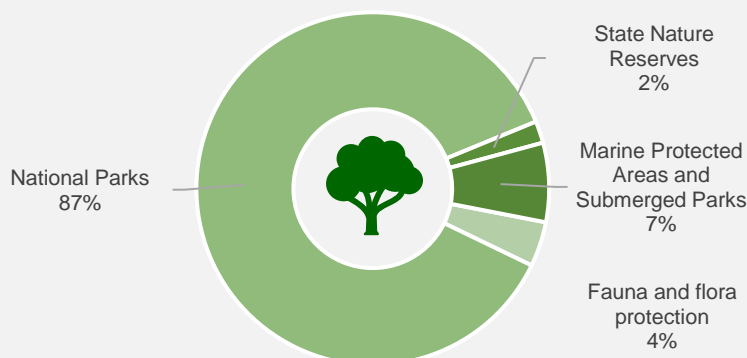
Protected Marine Areas, National Parks and State Nature Reserves:

Faced with a constant increase in pressures on biodiversity, **National Parks, State Nature Reserves, and Marine Protected Areas** constitute a practical element of conservation and protection of environments of more significant environmental and naturalistic value. Over the last ten years, Italy has strengthened the actions directed at the preservation of these areas through the identification and legislative provision of new territorial areas, both terrestrial and marine, worthy of protection, directing and increasing the actions for their conservation, and through the allocation of specific items of expenditure in the State budget that affect the entire system of national protected areas in a transversal manner.

- **Resources allocated to operating expenses** and personnel costs for the national protected areas, such as the current 24 national parks, 29 marine protected areas and the 2 submerged parks of Baia and Gaiola.
- **Interventions aimed at building and/or restoring dry stone walls.** Dry stone walls are a powerful tool for defence against erosive phenomena. They are the guardians of traditional local agriculture and therefore of cultivation and construction techniques of the ancient tradition. These structures constitute a landscape element of particular charm and significance whose importance at a global level has also been recognised by UNESCO. This recognition involves the territories of the Cinque Terre, the Amalfi Coast and Pantelleria. The priority is mitigating hydrogeological instability phenomena and maintaining habitats of particular interest for biodiversity (e.g., habitats of life and refuge for lichens, reptiles, birds, invertebrates and amphibians), ensuring the maintenance of the territory.
- **Interventions aimed at making the protected areas accessible through the valorisation, enhancement and maintenance of the path network.** These interventions are of primary importance for the national protected areas and their sustainable use through correct and governed access to the protected areas. The intervention allows an up-to-date mapping of the network of paths and a detailed knowledge of their State, favouring the necessary maintenance and possible enhancement activities.
- **The 'Parks for the Climate' programme,** through which 240 projects were financed and approved for actions aimed at adapting to climate change and pursuing the Agenda 2030 sustainable development goals (examples of the projects funded are: energy efficiency measures in park authorities buildings, investments in sustainable mobility, forestation measures).
- **Investments in MPAs** aimed at preserving the natural heritage and biodiversity of the marine protected environments. The investments mainly concern: i) extraordinary maintenance and/or restoration of the signalling elements necessary to provide precise information on the delimitation and zoning of the protected area; ii) the implementation and/or restoration of mooring fields to protect the seabed; iii) the purchase and/or extraordinary maintenance of nautical and land vehicles serving the MPAs; iv) the purchase of equipment and instruments functional to the management, surveillance and scientific monitoring of the MPAs; v) dissemination, awareness and promotion activities.

Figure 12 shows the distribution of resources allocated to the protected areas in the 2019-2022 reporting period.

Figure 12: 2019-2022 distribution of resources allocated to protected areas



Fonte: Elaboration on MASE data.

Soil protection and interventions against hydrogeological instability:

As of 2019, Italy has approved the **National Plan for Hydrogeological Risk Mitigation** to restore and protect environmental resources. Hydraulic risk mitigation for soil defence is key to the national recovery and resilience strategy.

This plan is structured into the following main areas of intervention: (i) emergency measures; (ii) prevention and safeguard measures; (iii) maintenance and restoration measures; (iv) simplification measures; (v) *governance* strengthening measures; and (vi) organisational measures.

Over time, in the implementation of this strategy, interventions of pre-eminent national interest (immediately executable and ready to be realised) have been planned for the prevention, mitigation and contrast of hydrogeological risk distributed throughout the country, some of which are financed through the proceeds collected from **BTP Green** issues.

Various monitoring and control systems – i.e., the **KRONOS**⁴⁹ and the **ReNDiS** systems⁵⁰ were developed, to check the status of implementation of these intervention plans.

Environmental protection, certification and protection of biodiversity:

- **Expenditures related to the implementation of the Washington Convention on Trade in Endangered Species (CITES).** The purpose of the Convention is to ensure that, where permitted, the international commercial exploitation of a species of wild fauna or flora is sustainable for the species and compatible with its ecological role in its habitat through the issuing of licences and certificates⁵¹.
- **Expenditures for the functioning of the Ecolabel and Ecoaudit Committee.** The Ecolabel-Ecoaudit Committee deals with the certification of the **EU Ecolabel**⁵², which is issued voluntarily to goods and services that are considered environmentally friendly

⁴⁹ https://www.mite.gov.it/sites/default/files/archivio/allegati/POA/POA_FSC_guida_operativa_KRONOS_versione_aggiornata_10052021.pdf

⁵⁰ <https://www.isprambiente.gov.it/it/progetti/cartella-progetti-in-corso/suolo-e-territorio-1/rendis-repertorio-nazionale-degli-interventi-per-la-difesa-del-suolo>

⁵¹ Convention signed in Washington on 3 March 1973. Italy ratified the Washington Convention with Law No. 874/1975. CITES lists more than 35,000 species of animals and plants with varying degrees of protection. CITES Member States work together to regulate trade in the listed species by issuing licences and certificates. In Italy, the authority for issuing certificates is the Ministry of Agriculture, Food and Forestry, which makes use of the Carabinieri's Comando Unità forestali, ambientale e agroalimentari (CUFA). The competent authority for issuing import and export licences is the Ministry of Foreign Affairs and International Cooperation. The control of compliance with the Convention, EU regulations and national legislation are entrusted to the Carabinieri CITES Regiment in the territory and to the Guardia di Finanza in the customs areas. CITES has been adopted in the European Union through regulations directly applicable to Member States (EC Regulation No. 338/1997; EC Regulation No. 865/2006; EU Regulation No. 792/2012; EU Regulation No. 1587/2019).

⁵² The EU Ecolabel was established in 1992 by Regulation (EC) No. 880/92 and is today governed by Regulation (EC) No. 66/2010 in force in the countries of the European Union and the countries belonging to the European Economic Area - EEA (Norway, Iceland, Liechtenstein).

and, therefore, have a lower environmental impact during their entire life cycle. This certification is issued based on scientific criteria linked to: the containment of energy and water consumption; the prevention of pollution (water, air, noise and soil); the development of durable products that are easy to repair and have considerable recycling potential; and the sustainable management of the natural and forest heritage⁵³.

- **Grants for the strengthening of certification activities for seed propagation material.** Separate EU and national regulations characterise seed propagation material⁵⁴. The sector comprises four areas: propagating material for vines, ornamental plants, fruit plants and vegetable seedlings, except for seeds.
- **Amounts earmarked for the protection and preservation of monumental trees** under Article 7 of Law No 10/2013 and implementing Decree of 23 October 2014. In order to ensure maximum protection, longevity and good preservation, the law prohibits the felling of monumental specimens and the modification of their trunks, reserving the possibility of such interventions only for justified cases. The latest available data reveal the presence of about **4,000 monumental trees** nationwide, a third of which are in urban areas.
- **Amounts allocated to the Italian Forest Fund⁵⁵** for interventions aimed at fostering the protection, valorisation, monitoring and dissemination of knowledge of Italian forests and at complying with the Consolidated Law on Forests and Forest Supply Chains (Legislative Decree no. 34/2018). Through the fund, various types of initiatives are financed, such as: the monitoring of the areas affected by the storm Vaia⁵⁶ (regions in the north-east of Italy) to follow the naturalistic and environmental evolution of the damaged forest areas; preparation of the territorial guideline forest plans for the planning of forest management at a local level; identification of areas classifiable as old forests for the purposes of their preservation and creation of the register of forest reproductive material. In addition, resources have been allocated for the CREA's creation of a **National Forestry Information System (SIFN)** as a collector of all the statistical, administrative and cartographic information available today and of environmental information relating to forestry matters.

International cooperation for environmental protection

- **Contribution resulting from the participation of Italy in the Union for the Protection of New Varieties of Plants** (*Union Internationale pour la Protection des Obtentions Végétales* – UPOV). The purpose of the UPOV is to promote an efficient system of protection for plant varieties and ensure that the members of the Union recognise the achievements of plant breeders by granting them intellectual property rights.
- **Expenditures for financing the experimental programme “Green Helmets for the Environment” to implement** international cooperation initiatives to protect and safeguard the environment of national protected areas and other areas recognised internationally for their unique naturalistic value and to counter the effects of climate change. To this end, a *task force* of experts has been set up to support and back up the managers of the sites, recognised in various ways by UNESCO, in defining safeguard and enhancement measures as well as in supporting management plans.
- **Contribution to the implementation of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA).** It refers to an independent international treaty that aims to conserve the migratory waterbirds listed in the same agreement in a geographical area covering Africa, Europe, West Asia, Greenland and north-eastern Canada.
- **Contribution by Italy to adhere to the ACCOBAMS Agreement** (*Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area*), which also includes the **Pelagos Sanctuary** dedicated to marine mammals in the north-western Mediterranean Sea and established by France, Italy and Monaco. To reduce threats to cetaceans and improve knowledge of these species, ACCOBAMS provides for the regulation, surveillance, protection and research of 27 cetacean species and subspecies found in the area covered by the agreement.

⁵³ The Ecolabel guarantees in particular: 1. Durable products that are easy to dismantle, repair, reuse and recycle; 2. Minimised CO₂ and pollutant emissions to water and air; 3. Minimised hazardous substances in processes and products; 4. Promotion of the use of recycled materials; 8. Reduced waste and high-quality recycles.

⁵⁴ Directive No. 2005/43/EC; Legislative Decree No. 151/2000; Legislative Decree No. 124/2010; Legislative Decree No. 124/2011.

⁵⁵ Fund established by Article 1(663) of Law No. 145/2018.

⁵⁶ Storm Vaia was a strong Mediterranean storm that occurred between October and November 2018, with hurricane-level wind gusts and heavy rainfall, which caused extensive damage.

- **Contribution resulting from Italy's participation in the Green Climate Fund (GCF)** in the implementation of the Paris Agreement and linked to the United Nations Convention on Climate Change (12 December 2015) The objective of the GCF is to support the efforts of developing countries in responding to the challenge of global warming by limiting greenhouse gas emissions or promoting adaptation policies. To date, the GCF represents one of the main vehicles of climate finance – both public and private – for climate change mitigation and adaptation⁵⁷.

⁵⁷ <https://www.mase.gov.it/pagina/green-climate-fund>.

CATEGORY

6

Research

Water sampling at the Dirigibile Italia Scientific Station of the National Research Council
NyÅlesund, Svalbard Islands. Photo Credit: @Dirigibile Italia Station – CNR



8 Research

CATEGORY

6



As already illustrated in the previous 2022 Allocation and Impact Report, the State budget finances, in addition to a number of specific projects carried out within the framework of international agreements (such as the ITER-DDT project on nuclear fusion⁵⁸), institutes which carry out research activities aimed at developing tools for understanding phenomena linked to the evolution of environmental dynamics, such as indicators for measuring the impact of human activity on climate and ecosystems. In addition, some of these institutions also have measures to counter environmentally harmful behaviour, often in the context of specific international cooperation agreements.

The total resources allocated to research against the proceeds collected in 2022 through the **BTP Green** issuances amount to approximately **EUR 411 million**, with a particularly significant weight of ISPRA, which is close to EUR 357 million, distributed among the four years reporting period.

Subcategories of eligible expenditure	2019	2020	2021	2022	Total
Contribution to the Euro-Mediterranean Centre on Climate Change (CMCC)	-	-	7,000	7,000	14,000
Contribution to European Centre for medium-range weather forecasts (ECMWF)	2,115	-	5,720	6,616	14,352
Support for scientific and technological research in the Arctic and Antarctic	-	1,000	1,018	20	2,039
ITER-DDT nuclear fusion project	-	-	10,000	-	10,000
Sustainable development, pollution prevention and reduction	413	473	501	575	1,961
Contributions to the Institute for Environmental Protection and Research (ISPRA)	91,366	94,121	95,121	76,280	356,888
Contribution to the Council for Agricultural Research and Analysis of the Agricultural Economy (CREA) and to the Institute for the Agricultural Food Market (ISMEA)	3,143	1,304	5,891	1,415	11,753

(values expressed in EUR thousand)

⁵⁸ <https://www.enea.it/it/Stampa/documenti/il-progetto-ddt-e-la-fusione-nucleare.pdf>

EU environmental objectives	
UN Sustainable Development Goals	
Subcategories of eligible expenditure subject to allocation	<p>ISPRA</p> <p>The Italian Institute for Environmental Protection and Research (ISPRA) performs technical and scientific functions, both directly and in support of the Ministry of the Environment and Energy Security, for the most effective planning and implementation of national environmental policies and the sustainability of pressures on the environment.</p> <p>The Institute carries out research, experimentation, control, monitoring, evaluation, inspection, technical and scientific assistance, strategic consultancy, environmental information management and environmental training, including post-graduate training. In these areas, it produces scenarios, reports, analyses and studies, working in constant liaison and comparison with the many scientific realities in the sector (other public research bodies, scientific societies, universities, etc.). This activity is carried out continuously with similar EU and international institutions, including the national transmission of environmental data in compliance with EU environmental legislation. ISPRA is responsible for the technical coordination of the National System for the Protection of the Environment (SNPA), implemented in a network logic with the environmental protection agencies of the regions and the autonomous provinces of Trento and Bolzano.</p> <p>ISPRA also carries out environmental monitoring and assessment activities to collect data and evidence on the state of the Italian environment. The relevant collection of data and evidence is carried out by the Agencies that make up the SNPA, which, with their widespread presence throughout Italy, can take numerous samples and carry out laboratory analyses, the results of which they communicate to ISPRA. Other data are collected through observations within the Copernicus Programme.</p> <p>Of particular note is ISPRA's certification activity, which covers three areas accredited by the Single National Accreditation Body appointed by the Italian government (Accredia)⁵⁹.</p> <p>This allocation contains the contributions paid for ISPRA's institutional activities from 2019 to 2022.</p> <p>Contribution to the Euro-Mediterranean Centre on Climate Change:</p> <p>The Euro-Mediterranean Centre on Climate Change (CMCC)⁶⁰ is a research organisation under public law whose mission is 'to carry out studies and models of the climate system and its interactions with society and the environment, to ensure reliable, timely and rigorous results, to stimulate sustainable growth, protect the environment and develop, in the context of climate change, adaptation and mitigation policies based on scientific knowledge'. The CMCC draws on the extensive applied research experience of its members and institutional partners: National Institute of Geophysics and Volcanology, University of Salento, Italian Aerospace Research Centre, Ca' Foscari University of Venice, University of Sassari, University of Tuscia, Politecnico di Milano, Resources for the Future, University of Bologna.</p> <p>The CMCC adheres to the UN Global Compact⁶¹ and collaborates with the best international centres specialised in advanced and applied climate research, with a vast portfolio of projects, for many of which the coordination has been assigned to the CMCC, which makes use of the Supercomputing Centre (SCC) in Lecce, the largest computing facility in Italy - and among the</p>

⁵⁹ <https://www.isprambiente.gov.it/it/attivita/CN-LAB/aree/area-metrologia/confronti-interlaboratorio>. For further details, see also Allocation and Impact Report 2022, p. 35.

⁶⁰ <http://www.cmcc.it>

⁶¹ The UN *Global Compact* is the world's largest strategic corporate citizenship initiative. It stems from the desire to promote a sustainable global economy: respectful of human and labour rights, environmental protection and anti-corruption (<https://globalcompactnetwork.org/it/il-global-compact-ita/global-compact/introduzione.html>).

most advanced in Europe - dedicated exclusively to research on climate change and its interaction with society and economic systems.

In 2021, CMCC was formally selected by the *World Meteorological Organization* (WMO) as one of 14 research centres for long-term weather forecasts. The WMO's *Global Seasonal Climate Update* uses Italian research to produce its quarterly bulletin.

In March 2021, the European Commission and the European Environment Agency launched the *European Climate and Health Observatory* and two CMCC scientists have been appointed to coordinate the **European Climate Adaptation Platform** (ADAPT).

Contribution to European Centre for Medium-range Weather Forecasts:

The **ECMWF** (European Centre for Medium-Range Weather Forecasts) is an intergovernmental organisation supported by 20 European Member States and 14 cooperative States, which aims to provide accurate global medium-term weather forecasts (up to 15 days) and seasonal forecasts for up to 12 months. The organisation is also characterised by the production of scientific and technical research aimed at improving these forecasts and the collection and storage of meteorological data. In the 2019-2022 reporting period, contributions were made to ECMWF for participation in numerous projects, including *Copernicus Climate Data Store* (CDS), *Copernicus Emergency Management Service* (CEMS), *Ocean Re-Analysis System 5* (Ocean5), *S2S pilot*.

Supporting scientific and technological research in the Arctic and Antarctic:

Italy is involved in numerous research projects in the polar regions, both in Antarctica, where the resources accounted for in this report are limited to participation in collaborations with international organisations, and in the Arctic, where there is a funding for missions carried out as part of the **PRA (Plan for Research in the Arctic)**. The research conducted in the polar regions is fundamental for acquiring a deeper understanding of past climate and biosphere evolution to enable the elaboration of future scenarios and, where possible, identifying actions to mitigate and adapt to ongoing climate change.

ITER-DTT nuclear fusion project:

Italy's participation in the European ITER project continues as part of the research programme managed by *Eurofusion* (a European consortium of which ENEA is a member) and in favour of the new *DTT (Divertor Tokamak Test facility)*, active in experimentation aimed at the production of nuclear energy through fusion, which, in addition to generating power without the emission of CO₂ and other greenhouse gases, will not even produce radioactive waste. This report considers the EUR 10 million grant for this purpose in 2021.

Sustainable development, pollution prevention and reduction:

This Report accounts for the contributions disbursed throughout the four-year period 2019-2022 for studies and research on air pollution carried out in the framework of international cooperation, as well as the expenditure of EUR 154,000 in 2019 in implementation of the Collaboration Agreement with the **Forest, Environmental and Agro-Food Units Command (CUFAA)** for the start-up and management of the Network for monitoring the impacts of air pollution on ecosystems "**NEC Network**".

Contribution to CREA and ISMEA:

CREA (Council for Research in Agriculture and Analysis of Agrarian Economy) is a research body supervised by the Ministry of Agriculture, Food Sovereignty and Forestry (MISAF), which deals explicitly with research aimed at studying new techniques for adapting Italian agricultural production to current climate change, preserving its quality and biodiversity. It also extends its activity to the periodic monitoring of forests in support of forestry and environmental policies to combat climate change, assessing their consistency and health. At the beginning of 2020, it completed the third **National Inventory of Forests and Carbon Sinks**, noting an increase in the national forest area (a total of 11 million hectares) of about 587,000 hectares over the past ten years. Forest biomass increased by 290 million tonnes, with a consequent increase in carbon dioxide absorption. CREA comprises 12 research centres and works in partnership with FAO, the University of California - Davis Campus, and the Faculty of Agriculture of the

University of Trieste. There are 305 research projects in place, employing 1520 researchers and technicians and managing 66 experimental farms.

In addition, in the 2019-2022 period contributions for research purposes for agricultural cooperation were provided to the Institute for Services for the Food Agricultural Market (ISMEA), which plays a vital role in information and innovation in the farming sector.

9 Relevance of allocated activities according to EU Taxonomy



In an economic context that is increasingly moving towards low-carbon models, more efficient and circular in its use of resources and aimed at combating climate change and global warming, the process of regulating sustainable finance implemented by the European institutions is becoming increasingly important; this is to ensure standard rules and an organic approach to combat *green washing* and create dedicated financing channels for environmentally sustainable projects.

In July 2021, as part of the renewed Strategy to make the EU financial system more sustainable, the European Commission presented a proposal for a Regulation⁶² outlining uniform requirements for bond issuers wishing to use the name **European Green Bond (EuGB)** label, to which any public or private issuer of green bonds can adhere.

Extending the principles set out in the ICMA **Green Bond Principles** (ICMA)⁶³, the **European Green Bond Standards (EuGBS)** will place greater focus on the projects to which proceeds raised from green issues are allocated, with the aim of supporting investors in identifying the worthiest initiatives, increasing the quality of instruments and setting *standards* for external auditing activities.

The political agreement reached on the **EuGBS** Regulation of 28 February 2023 stipulates that:

- **at least 85%** of the capital raised goes to **projects in line with the EU Taxonomy** in accordance with the EU Regulation No. 2020/852 and subsequent delegated acts⁶⁴;
- **full transparency** and detailed disclosure on how capital is allocated must be ensured, even through standardised templates for issuers to be published by the European Commission;
- monitoring of compliance with the requirements will be carried out by **external auditors**, selected in a special register and monitored by the European Securities and Markets Authority (ESMA), who will be called upon to intervene at various times during the life cycle of the bond, to ensure compliance with the Regulation and the **alignment of projects with the EU Taxonomy**, based on technical screening criteria⁶⁵.

The EU Green Taxonomy is **a unified classification tool for environmentally sustainable economic activities**, i.e. *activities that make a substantial contribution to the objectives of the European Green Deal without adversely affecting any of the other environmental goals*. They contribute to the pursuit of Europe's growth strategy to improve the well-being and health of its citizens, become climate neutral by 2050 and protect, conserve and enhance its natural capital and biodiversity.

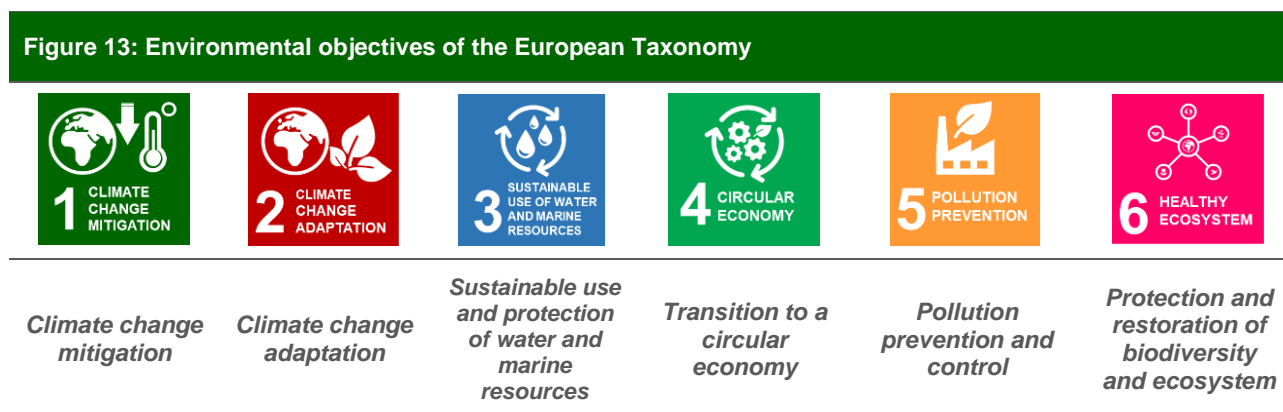
⁶² COM(2021) 391 final.

⁶³ <https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf>.

⁶⁴ For sectors not yet covered by the EU taxonomy and for some very specific activities, a 'flexibility pocket' of 15% is in fact foreseen in order to ensure the usability of the EuGB label from the beginning of its existence. The use and necessity of this flexibility pocket will be reviewed as Europe's transition to climate neutrality progresses and on the basis of the increasing number of attractive and green investment opportunities that are expected to become available in the coming years.

⁶⁵ The basic requirements of Substantial Contribution, *Do No Significant Harm* ('DNSH') and *Minimum Safeguards* are defined in general terms by Regulation 852/2020, in Articles 10 to 18. However, in order to prevent these concepts from remaining abstract and difficult to apply, the EU legislator envisaged specifying them further, through the elaboration of special *Technical Screening Criteria* ('TSC'), which aim at declining the requirements of Substantial Contribution and DNSH in the context of individual economic activities. These are therefore the requirements, based on consolidated scientific knowledge, that each economic activity must meet in order to be defined as environmentally sustainable, punctually indicated in the Climate and Environment delegated acts to Regulation 852/2020 and subsequent modifications.

The EU Taxonomy is thus a **transparency tool based on scientific criteria**, which aims to contribute to increasing the growth of sustainable investments, allowing investors' and companies' choices to be redirected towards a transition and economic growth free of negative impacts on the environment and contributing to **six climate-environmental objectives** (Figure 13).



To facilitate the application of the EU Taxonomy, the European Commission also introduced the *EU Taxonomy Navigator*, which includes the **Taxonomy Compass** tool⁶⁶. This tool enables the identification by investors of those economic activities that are to be considered **relevant under the EU Taxonomy**. At the same time, the tool helps to assess, based on technical screening criteria (defined in the Delegated Acts to the Regulation), to which environmental objectives each activity can contribute substantially without at the same time causing any significant damage to the environment (Do Not Significant Harm – DNSH principle) and in compliance with the minimum safeguards⁶⁷.

The State and public bodies are not among the entities obliged to comply with Regulation 2020/852; however, in anticipation of the entry into force of the new **EuGBS** and in the **desire to provide investors with complete information** also on EU regulations on sustainable finance, an initial **simplified application** exercise of the **EU Taxonomy** was launched in this Report aimed at assessing the **traceability of expenses allocated to economic activities classified as potentially eco-sustainable**⁶⁸.

⁶⁶ The Taxonomy Compass provides a representation of the contents of the EU Taxonomy, starting with the Climate Delegated Act (Climate Change Mitigation Annex I and Climate Change Adaptation Annex II), published in the Official Journal on 9 December 2021, which entered into force on 1 January 2022. The *Taxonomy Compass* also includes the contents of the Supplementary Delegated Act, published in the Official Journal on 15 July 2022, which entered into force on 1 January 2023. The *Taxonomy Compass* constitutes the official methodological tool for verifying which activities are included in the EU Taxonomy (eligible) and which criteria they must fulfil to contribute substantially to one of the environmental objectives and not harm any other objectives (DNSH). As it is linked to the development of official legislation, the tool refers nowadays only to the first two environmental objectives, for which delegated acts have already been published. The Commission will update this tool to the remaining environmental objectives (3-6) of the Taxonomy when the subsequent delegated acts are issued and as the relevant technical screening criteria are defined. In this regard, in April 2023, a proposal for an amendment to the Delegated Climate Regulation was published by the European Commission with the related technical screening criteria referring to Objectives 3-6 of the EU Taxonomy (proposal subject to public consultation, which ended on 3 May 2023).

⁶⁷ Minimum Safeguards are set out, in general terms, in Article 18 of EU Regulation 852/2020, which states that to be environmentally sustainable, economic activities must be conducted: 'in line with the OECD Guidelines for Multinational Enterprises and the United Nations Guiding Principles on Business and Human Rights, including the principles and rights set out in the eight core conventions identified in the International Labour Organisation's Declaration on Fundamental Principles and Rights at Work and the International Bill of Human Rights.' Anticipating the development and purpose of the future Social Taxonomy, this standard stipulates that, in any case, pursuing an environmental objective cannot violate minimum social protection standards and international labour and human rights standards (see Recital 35 of the Taxonomy Regulation).

⁶⁸ As the sustainable finance legislation gradually becomes fully operational and the EuGBS come into force, it will be possible, in subsequent editions of the Report, to further strengthen reporting against Europe's green legislation, progressively including the assessment of the alignment of the measures financed with the EU Taxonomy, measuring their actual contribution to each of the six

To assess the relevance of the country's green transition expenditure under the EU Taxonomy, the State budget individual expenditure items considered for allocating the proceeds collected from **Green BTP** issues were reconciled with the sectors and economic activities mapped in the European Commission's *Taxonomy Compass*, referring for the time being **only** to the **first two objectives** (**mitigation** and **adaptation** to climate change) dealt with in the June 2021 Climate Delegated Regulation⁶⁹, net of the sectors added by the amendment proposal published in April 2023 by the European Commission⁷⁰.

Instead, for the **remaining four environmental objectives** of the EU Taxonomy (Objectives 3-6), although the related technical screening criteria are not yet in force, the economic sectors and activities identified in the draft Environment Delegated Regulation, and the related technical screening criteria put out for consultation by the Commission⁷¹ on 5 April 2023⁷², were considered.

For the attribution of measures to the sectors considered environmentally sustainable, for the two climate objectives the codes used are those of the statistical classification of economic activities in the European Communities (NACE) indicated in the Taxonomy Compass, while for the remaining four objectives those included in the draft Environment Regulation. The precise association of the NACE classification to the individual expenditure items of the State Budget was done on the basis of the corresponding mission, programme, competent centre, action and management plan, and their association with the International Classification of Public Expenditure by Function (COFOG)⁷³. All the detailed information shared by the relevant Ministries, gathered within the Interministerial Committee for Green Government Bonds to assess the potential capacity of the individual expenditure to contribute to one or more of the *Green Deal's* environmental objectives, has also been considered.

In the presence of specific activities of the public sector, not included in the current formulation of the Taxonomy but also able to contribute significantly to climate objectives, an extensive interpretation of the classification of eco-sustainable activities has been adopted, in full respect of the *ratio* and the will of the EU legislator and in line with what was indicated by the Technical Expert Group on Sustainable Finance (TEG) in the Final Report on the 2020 Taxonomy⁷⁴. This made possible, for example, to enhance the potential contribution of marine protected areas to the objective of climate change mitigation, given the

environmental objectives, in compliance with the DNSH principle and the minimum safeguard guarantees. This assessment can in fact only intervene through the precise application of the technical *screening* criteria (so-called TSC) that will be detailed, for each of the environmental objectives, within the approved delegated acts.

⁶⁹ Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by laying down the criteria for technical screening to determine under which conditions an economic activity can be considered to contribute substantially to climate change mitigation or adaptation and if it does not cause significant damage to any other environmental objective, published in the Official Journal of the EU L 442/1 of 9.12.2021.

⁷⁰ European Commission's amendment proposal entitled "amending Delegated Regulation (EU) 2021/2139 as regards additional technical screening criteria for determining the conditions under which certain economic activities qualify as contributing substantially to climate change mitigation or climate change adaptation and for determining whether those activities cause no significant harm to any of the other environmental objectives".

⁷¹ Proposal of the European Commission 'supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to the sustainable use and protection of water and marine resources, to the transition to a circular economy, to pollution prevention and control, or to the protection and restoration of biodiversity and ecosystems and for determining whether that economic activity causes no significant harm to any of the other environmental objectives and amending Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities' and its annexes, namely: Annex I: Sustainable use and protection of water and marine resources; Annex II: Transition to a circular economy; Annex III: Pollution prevention and control; Annex IV: Protection and restoration of biodiversity and ecosystems; Annex V: Amendments to Annex I, II, III, IV, V, VI, VIII and X of the Disclosures Delegated Act; Annex VI: Revised Annex VI of the Disclosures Delegated Act; Annex VII: Revised Annex VIII of the Disclosures Delegated Act.

⁷² See, in particular, the list published in the European Commission document 'Content overview of draft Taxonomy Environmental and Climate Delegated Acts'.

⁷³ In the case of items in the state budget that affect several interventions, which can be attributed to different public expenditure functions, the same chapter has been classified as many times as the functions concerned (COFOG), and the relevant sums have been apportioned.

⁷⁴ In the Final Technical Report on the Taxonomy, the Technical Expert Group on Sustainable Finance (TEG) points out that there are 'economic activities that are not directly covered by NACE codes...important for climate change mitigation and adaptation' (i.e., energy efficiency of buildings). It adds that 'it is likely that additional NACE codes will need to be added to enable the taxonomy to cover activities such as: (i) services and facilities to support changes in lifestyle choices - for example, an increase in plant-based diets or prioritising walking over driving; (ii) conservation, restoration and creation of natural capital and related services'. See EU Technical Expert Group on Sustainable Finance, 'Taxonomy: Final report of the Technical Expert Group on Sustainable Finance', March 2020.

importance of the seas in combating global warming. At the same time, the economic activity related to the construction and modernisation of public utility works for the transport of fluids, including aqueducts, (NACE code 42.21) was considered relevant to the first environmental objective of the EU Taxonomy, in view of the lower energy consumption associated with reduced dispersion and greater efficiency of the integrated water service infrastructure.

Therefore, the relevance of the allocated expenditure items to **all objectives of the EU Taxonomy** was carried out according to a **multi-level approach** (see methodological note in Appendix II) based on:

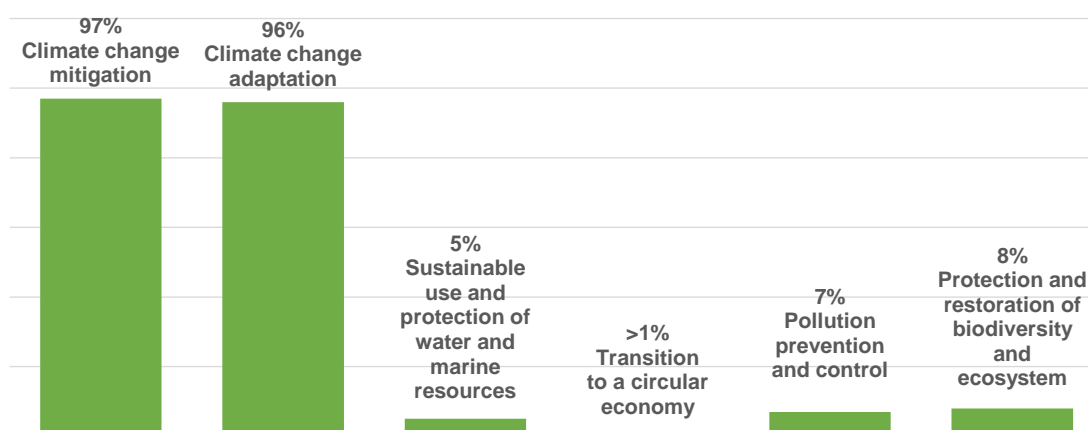
- The mapping of economic activities in the *Taxonomy Compass* of the European Commission for the first two objectives of the EU Taxonomy;
- The list of economic activities identified in the draft Environment Delegated Regulation published by the European Commission in April 2023 for Objectives 3-6 of the EU Taxonomy;
- The possible connection of allocated economic activities, aggregated by homogeneous expenditure macro-categories for environmental purposes, according to a broad interpretation, to the objectives of the EU Taxonomy, taking relevant reports and research into account.

Following this approach, it was possible to **trace all 80 the expenditure items** in the State budget allocated to potentially environmentally sustainable activities according to **all the environmental objectives set by the EU Taxonomy**. Of course, the distribution of expenditure items by EU objectives takes into account the possibility that some measures may **contribute to one or more environmental objectives at the same time**; this is in light of the characteristics of the intervention and in line with what is stated in the delegated acts to the EU Taxonomy.

Based on the exercise described above, **97% of the allocated resources are potentially environmentally sustainable according to the first two objectives of the Green Taxonomy**, being able to contribute to EU climate policy, either exclusively (84% of the total allocated) or in combination with other environmental objectives (14%). The additional measures financed, on the other hand, fall within the sectors and activities of interest to the remaining environmental objectives, in particular, the sustainable use and protection of water and marine resources, the protection of biodiversity and the prevention and control of pollution, and (to a lesser extent than the other objectives) the transition towards the circular economy (Figure 14).

Figure 14: Green BTP contribution to environmental objectives

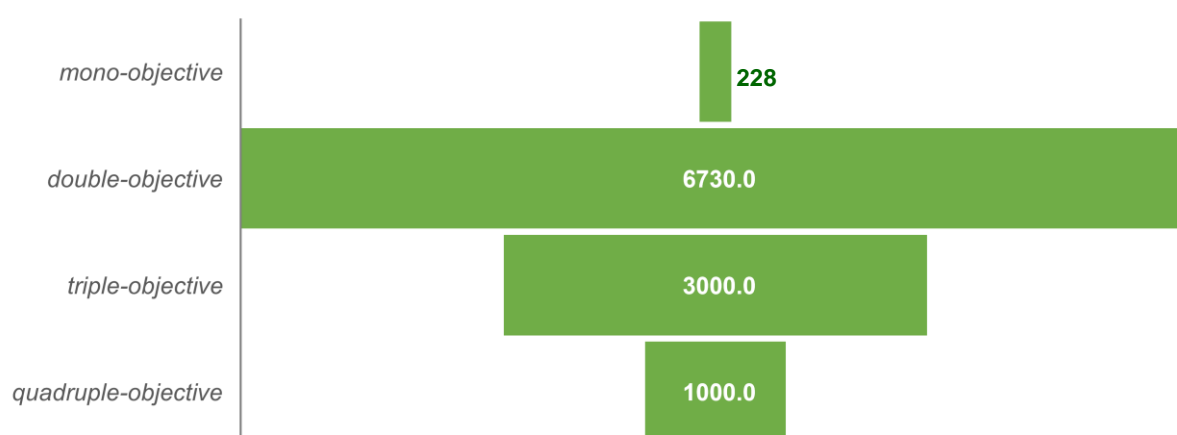
% of allocated resources contributing to each environmental objective out of total allocated resources (some measures contribute simultaneously to several objectives)



Sources: Elaboration on allocated resources.

The distribution of resources by objectives considers the possibility of some measures contributing **simultaneously to two or more environmental objectives** in the light of the specific characteristics of the intervention and with the indications of the delegated acts to the Taxonomy (Figure 15). For example, the financing of the Italian forestry fund contributes not only to both climate objectives (in consideration of the carbon storage capacity of forests and the effects of increased prevention and control of the territory, as well as timeliness in emergency response operations on the risk of forest fires related to climate change⁷⁵) but also to the protection of ecosystems and biodiversity.

Figure 15: Breakdown of allocated resources by number of intercepted objectives
(values expressed in EUR million)



Sources: Elaboration on allocated resources.

For the initiatives falling into the categories indicated by EU legislation as potentially contributing to climate objectives (1 and 2 of the Taxonomy), **the type of contribution**⁷⁶ was also **assessed**, distinguishing between:

- **Activities that can contribute to climate change mitigation and/or adaptation objectives**, as they are carried out in an environmentally sustainable (*low-carbon*) manner;
- **So-called 'enabling' activities**⁷⁷, i.e. directly enabling other activities to provide a substantial contribution to an environmental objective;
- (For the sole purpose of mitigation) **'transition' activities**, i.e., for which there are no technologically and economically feasible low-carbon alternatives and which, nevertheless, have a performance - understood as the level of carbon emissions - that corresponds to the sector's best performance⁷⁸.

⁷⁵ As stated in the National Climate Change Adaptation Plan (NACC) produced by the Ministry of the Environment and Energy Security.

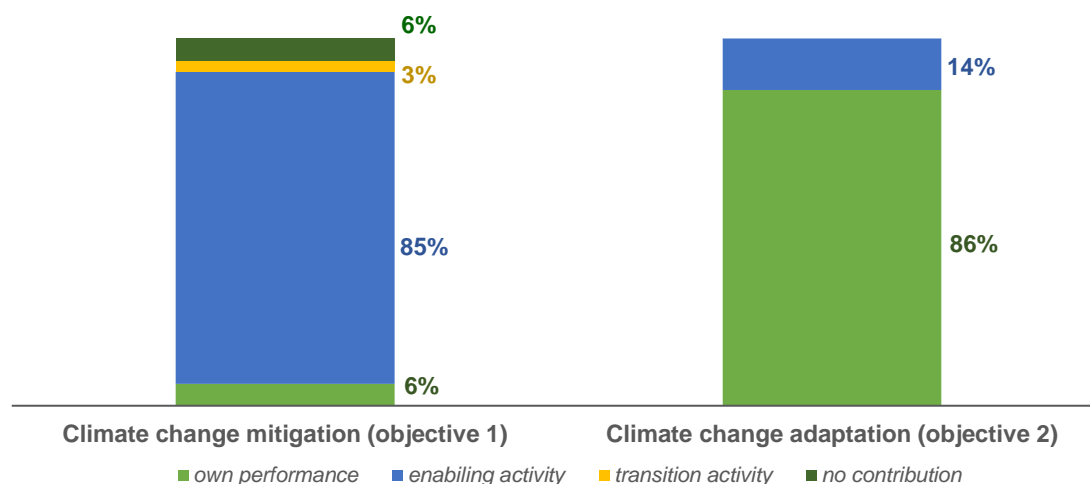
⁷⁶ The *Technical Expert Group on Sustainable Finance* (TEG) distinguishes activities that can contribute substantially to the Union's climate objectives into activities that contribute through their performance (*own performance*), enabling activities (*enabling*) and - for the climate change mitigation objective only - transition activities (*transition*). See Section 2.1.2 'Types of economic activities that contribute substantially', *EU Technical Expert Group on Sustainable Finance, 'Taxonomy: Final report of the Technical Expert Group on Sustainable Finance'*, March 2020.

⁷⁷ Definition given in Art 16 of the EU Taxonomy Regulation. This category includes, for example, activities that consist of the installation of energy-efficient equipment or that produce devices for monitoring the state of the environment.

⁷⁸ Definition present in Art 10 of the EU Taxonomy Regulation. This category is reported under the sole objective of climate change mitigation.

In detail, most **funded activities pursuing climate objectives contribute to adaptation through their own performance**. At the same time, there are still many enabling or transitional activities for climate change mitigation (Figure 16).

Figure 16: Breakdown by type of contribution to environmental objectives (1 and 2 of EU Taxonomy)
(% of total allocated resources potentially relevant to objectives 1 and 2)



Sources: Elaboration on allocated resources.

As it will be better detailed in the following section analysing the impact of the measures financed concerning the economic sectors activated, classified according to NACE codes, the resources allocated are prioritised to the most relevant sectors from the point of view of environmental impacts. In particular, the **sectors of real estate** (related to energy efficiency measures on buildings) **and transport** (including the construction and modernisation of infrastructures) are the largest beneficiaries of the allocated resources, accounting for four-fifths of the total. This is followed by **professional, scientific and technical services** (which also includes research), activities for the **protection and restoration of ecosystems and wetlands**⁷⁹, **infrastructure for water supply**, sewerage and waste treatment⁸⁰ and, to a lesser extent, **activities related to the management of nature reserves and forests**⁸¹, including conservation forestry⁸², as well as for the production of **energy from renewable sources** (Figure 17).

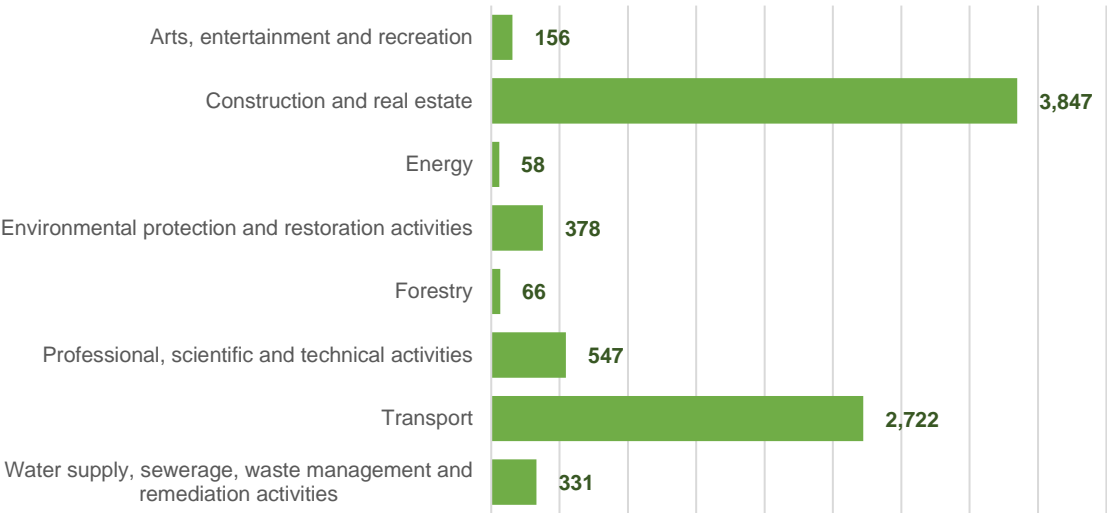
⁷⁹ "Wetlands" are defined as land corresponding to the international definition of wetlands or peatlands in the *Ramsar Convention* on Wetlands of International Importance especially as waterfowl habitat. According to the *Ramsar Convention*, wetlands include a wide variety of inland water habitats such as swamps, wet meadows and peat bogs, floodplains, rivers and lakes, and coastal areas such as salt marshes, mangroves, intertidal mudflats and grasslands, coral reefs and other marine areas deeper than six metres at low tide, as well as artificial wetlands such as dams, reservoirs, rice paddies and ponds and sewage treatment lagoons. See *An Introduction to the Ramsar Convention on Wetlands*, 7th ed. (formerly *The Ramsar Convention Manual*). Ramsar Convention Secretariat, Gland, Switzerland.

⁸⁰ It should be noted that, according to the EU taxonomy, construction activities for new infrastructure or modernising existing infrastructure are also included in the 'transport' or 'water and sewerage' sectors. Differently, for the purposes of the environmental economic accounts analysis, the construction of infrastructure falls under the construction sector.

⁸¹ Pursuant to the Consolidated Text on Forests and Forestry Chains, Legislative Decree, 03/04/2018 no. 34, O.J. 20/04/2018, art. 7, c. 1, forest management activities and article 3, letter b).

⁸² Understood as "forest management activities aimed at the conservation of one or more habitats or species". Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021, supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council.

Figure 17: Breakdown of allocated resources by EU Taxonomy sectors
(values expressed in EUR million)



Sources: Elaboration on allocated resources.

Details on the methodology used for the exercise of assessing the allocated resources in accordance with the EU Taxonomy, represented in this section, can be found in the Methodological Note (Annex II: Methodological note on the NACE classification of green expenditure and eligibility assessment for the EU Taxonomy).

Part II: Environmental impact assessment of green projects

Introduction to environmental impact assessment of green project



The **EUR 8.10 billion** of environmental eligible expenditure, identified in the Italian State budget in the year of issue of the **2035 BTP Green** (2022) and in the three preceding years (2019, 2020 and 2021) as proceeds collected from the issue of green government bonds and injected into the national economic system, have had **a quite significant impact**, i.e., about **EUR 13 billion** in terms of added value, that is about 0.7 % of the GDP.

This impact estimate implies that **each million euro of expenditure financed in the sectors affected by the allocation of resources collected by BTP Green is capable of generating approximately 1.6 million euro of added value**⁸³.

The added value generated by the expenditure financed through the issue of green government bonds has important effects on the demand of workers needed to meet such a level of economic activity. This demand can be quantified in **more than 200,000 work units: every million euro of expenditure activates about 25 thousand work units**⁸⁴.

Figure 18: Estimated impact of allocated green expenditures 2035 BTP Green



Source: Elaboration on MEF data.

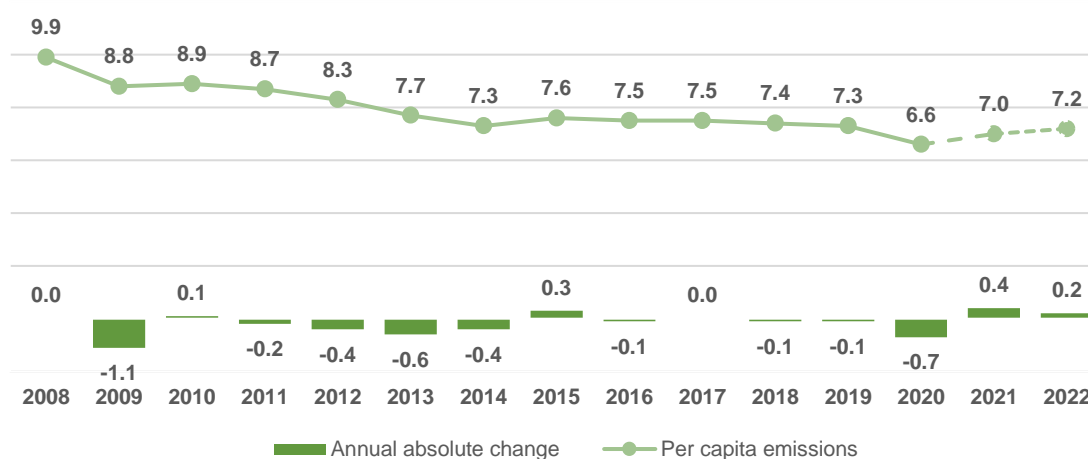
⁸³ Through the Input-Output (IO) matrices, it is possible to estimate the impact in terms of added value and employment (labour units created/supported) generated by the expenditure incurred by the branches of economic activity as a result of raising resources through the issue of green government bonds. The ability to generate an impact is linked to two factors: the volume of resources employed and their multiplier potential, which, in turn, depends on the branches of economic activity affected by the investments. In particular, the expenditures financed through the proceeds of the BTP Green, reclassified according to NACE sectors, are assigned sectoral multipliers derived from the national input/output matrix (created based on the Resources and Uses tables published by ISTAT, latest available year 2018). Thanks to this exercise, it is possible to assess the impacts that affect the direct beneficiaries of the expenditure (direct effect) that affect other economic sectors as a result of intersectoral exchanges (indirect effect) and of the increased consumption activated along the entire supply chain (induced effect).

⁸⁴ The labour unit is a measure introduced in 1999 by the European Union and used by ISTAT within the framework of national accounts, in order to calculate the employment base in a uniform way throughout Europe. It is a unit of measurement of the volume of work performed in employment positions. It is calculated by reducing the unit value of part-time jobs to full-time equivalents.

The issue of the **2035 BTP Green** and, more generally, of green government bonds is part of a trend of overall improvement in the environmental pressures by the economic system, which has characterised the last 13 years. In this regard, the most significant drop in atmospheric emissions occurred between 2008 and 2015. As a matter of fact, as of 2015, the volume of CO₂ and other climate-changing gases per capita⁸⁵ stood at just over 7 tonnes equivalent (Figure 19).

The two-year period 2020-2021 has obviously seen a significant cyclical reduction due to the contraction of economic activity caused by the pandemic, while by 2022 it is estimated that CO₂ equivalents per capita will remain at levels comparable to pre-pandemic values, for a total annual value of CO₂ equivalents of around 420 million tonnes⁸⁶.

Figure 19: CO₂ and other climate-altering gases per capita
(tonnes CO₂ equivalent and year-over-year absolute changes)



Source: BES indicators – Economic and Financial Document 2023 Annex, MEF.

Starting from the reclassification by sector of economic activity of the expenses allocated with the issue of the **BTP Green**, it was carried out an analysis of the environmental profile of the sectors financed with the issue.

Overall, the eight sectors benefiting from the expenditure financed through the proceeds of the **2035 BTP Green** contribute to **almost 63% of the total emissions of production activities**⁸⁷, amounting to **just over 195 million tonnes of CO₂ equivalent**, against a contribution in terms of added value of about 32% of the total at national level.

The two sectors in which intervention was most important in terms of allocated resources were **real estate and construction**, with a total of **allocated resources of EUR 3.85 billion**, and **sustainable transport and mobility**, with a total of **allocated resources of EUR 2.67 billion**.

The **construction and real estate** sector does not have a particularly relevant emission profile, with a rather small share of emissions, i.e. about 2% of the total. However, in the period when – on average –

⁸⁵ The indicator concerning CO₂ equivalent emitted on an annual basis by agricultural, urban and industrial activities per inhabitant allows us to show the trends regarding the quality of the environment and the relative impact of implemented policies/interventions, and - indirectly - to measure sustainability in terms of climate change risk.

⁸⁶ "Equitable and Sustainable Well-Being Indicators" annexed to the Economic and Financial Document 2023.

⁸⁷ Data referring to 2021.

the sectors' emission capacity tended to decrease, an increase in the tonnes of CO₂ emitted was recorded in this sector. Considering that the resources allocated with the **BTP Green** in this sector are linked to tax incentives for the energy efficiency of buildings, it can be assumed that these interventions will contribute to slowing down the growth trend in emissions that has characterised this sector in recent years.

On the other hand, the **transport and mobility** sector, which is the second one in terms of CO₂ emissions after the energy sector, is characterised by a significant environmental footprint, which could benefit from the interventions financed through the proceeds collected by the **BTP Green issuances**, all of which in favour of rail mobility rather than other competing and more polluting modes of transport. These investments are mainly aimed at **expanding and improving the railway infrastructure and subway lines**, and at encouraging **rail freight transport** likely to reduce the sector's overall emissions.

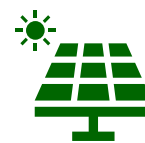
The other interventions financed with the proceeds from the issue of green government bonds in 2022 concern sectors which do not have a significant ecological footprint (with the exception of the energy sector, which alone produces about a quarter of Italy's total emissions) but have been characterised by the fact that they have significantly reduced CO₂ equivalents emissions over the past few years.

Table 4: CO₂ emissions and other climate-altering gases and share of allocation by sector

Sector description	Mln. tonnes of CO ₂ eq	2015-2021 change (%)	Share of CO ₂ eq. (%)	Share of EUR allocated (%)
<i>Construction and real estate</i>	6.2	4%	2.0%	47%
<i>Transport</i>	40.1	3%	12.8%	34%
<i>Professional, scientific, and technical activities</i>	1.3	-3%	0.4%	7%
<i>Environmental protection and restoration activities</i>	2.7	-17%	1.0%	5%
<i>Water supply, sewerage, waste management, and remediation activities</i>	24.3	1%	7.8%	4%
<i>Arts, entertainment, and recreation</i>	0.6	-8%	0.2%	2%
<i>Energy</i>	78.2	-18%	25.1%	1%
<i>Forestry</i>	0.1	5%	0.03%	1%
<i>Other sectors</i>	116.4	-8%	37.3%	-
Total	311.7	-8%	100%	100%

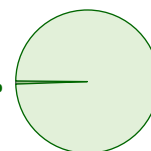
Source: Elaboration on NAMEA air emissions data, 2022 ISTAT data, and allocated resources.

10 Energy transition and sustainable building



10.1 Renewable sources for electricity and heat production

0.71%



% 2019-2022 allocated resources

UN Sustainable Development Goals			EU environmental objectives			CATEGORY 1	
					Renewable sources for electricity and heat production		
Subcategories of eligible expenditure			2019	2020	2021	2022	Total
Tax benefits for energy from renewable sources			-	-	-	57,850	57,850

(values expressed in EUR thousand)

Taxation of energy products and electricity plays an important role in climate and energy policies. It directly affects the green transition by sending the right price signals and providing effective incentives for sustainable consumption and production.

In line with this, as part of the new strategy of the European Green Deal and the restructuring of the Community framework for energy products and electricity started with the Directive 2003/96/EC, the Republic of Italy has provided for **the exemption from payment of electricity excise produced by plants powered by renewable sources with available power greater than 20 kW, consumed by self-handler companies in premises and places other than homes**⁸⁸.

In particular, in giving Member States the flexibility to define and implement appropriate policies for their national context, Directive 2003/96/EC recognises that taxation of energy products and electricity is one of the tools available to achieve the objectives of the Kyoto Protocol, ratified by Italy as part of the United Nations Framework Convention on Climate Change. It facilitates the transition from fossil fuels to cleaner energy so as to achieve the goal of climate neutrality, in line with the commitments of the Paris Agreement.

It should be highlighted that the electricity benefiting from the exemption considered in this Report is **exclusively the one produced by plants powered by renewable sources with available power greater than 20 kW and self-consumed electricity**. Therefore, electricity fed into the grid does not benefit from this exemption, nor does electricity purchased from a seller. However, electricity production plants powered by renewable energy sources that feed unused excess production into the grid benefit

⁸⁸ According to article 52, paragraph 3, letter b) of the Consolidated Act on Excise Duties (TUA) of the legal provisions regarding taxes on production and consumption and the relevant criminal and administrative sanctions approved by Legislative Decree No. 504 of 26 October 1995 (hereinafter referred to as the TUA), electricity produced by plants powered by renewable sources pursuant to the applicable legislation, with available power greater than 20 kW, consumed by self-production companies in premises and places other than homes, is exempt from excise. This exemption was included in the TUA with Legislative Decree No. 26 of 2 February 2007, which implemented the provisions of Directive 2003/96/EC of 27 October 2003.

from other incentives, governed by Ministerial Decree 04/07/2019, which are disbursed and managed by the GSE (Energy Services Manager), which directly gives a contribution in the bill. Therefore, although it is a facilitating measure provided for by the legislation, it does not directly affect the State budget and cannot be included among the eligible tax expenses for the issue of the **BTP Green**.

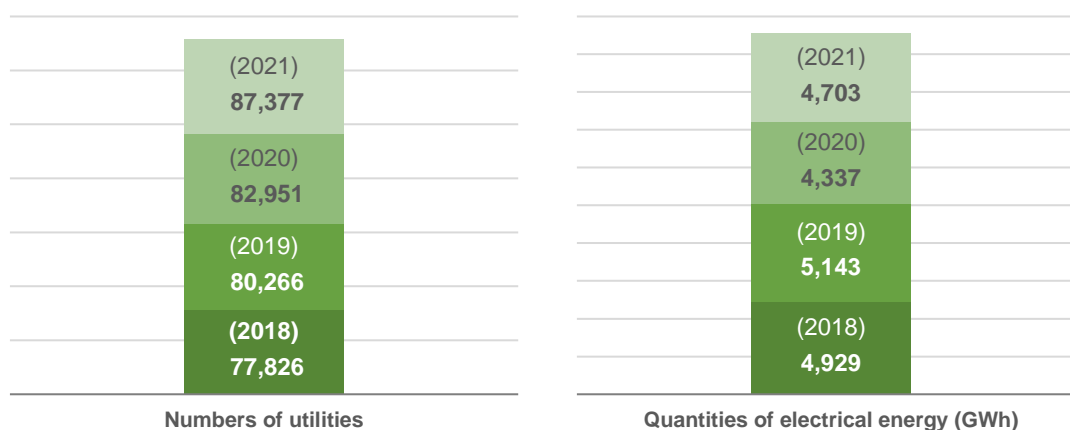
In order to determine the **environmental performance** of the financed measure, in line with what was done in the last 2022 Allocation and Impact Report, in order to determine the quantity of electricity produced by plants powered by renewable sources with available power greater than 20kW, consumed by self-handler companies in premises and places other than homes, the declarations of electricity consumption submitted to the Italian Customs and Monopolies Agency were used as well as the total number of the above-mentioned plants provided by the GSE (Table 5).

Taking into account 2021 and 2022 BTP Green issuances, that finance the measure in the period 2018-2021, the incentive affected **328,420 consumers** and **19,112 GWh of electricity** (Figure 20).

Table 5: Numbers of utilities and quantities of electrical energy (kWh)				
Indicators	2022 Report			2023 Report
	2018	2019	2020	2021
<i>Numbers of utilities</i>	77,826	80,266	82,951	87,377
<i>Quantities of electrical energy (kWh)</i>	4,928,967,897	5,142,620,580 ⁸⁹	4,336,893,772	4,703,180,795

Sources: Elaboration on GSE and Customs and Monopolies Agency data.

Figure 20: Numbers of utilities and quantities of electrical energy (2018-2021)



Sources: Elaboration on GSE and Customs and Monopolies Agency data.

⁸⁹ As a result of an incorrect quantification of the amount of tax expenditure incurred in 2019, for the prevision of the excise exemption on electricity it was necessary to adjust the quantities of electricity - expressed in kWh - associated to the measure for 2019. Specifically, the quantity of electricity - expressed in kWh - initially associated to the measure for 2019 (equal to 9,860,954,468 kWh) has been replaced by an estimated value (equal to 5,142,620,580 kWh) obtained as follows: *Amount of electricity year 2019 = New amount of tax expenditure incurred in 2019 weighted by the arithmetic mean of the ratios (Amount of tax expenditure incurred in year-t / Amount of electricity recorded in year-t) in the years 2018, 2020 and 2021*. Of course, the change in the quantities of electricity - expressed in kWh - for 2019 resulted in a recalculation of the avoided emissions of t.CO₂ reported in Table 5 according to the annual emission factor - expressed in gCO₂/kWh - reported in the ISPRA's 2022 report called 'Efficiency and decarbonization indicators in Italian energy and power sector'.

Analysing the environmental impact of the incentive measure discussed in this section, the **environmental performance indicator** used is the reduction expressed in tonnes of CO₂ emissions determined by the electricity produced by plants powered by renewable sources with available power greater than 20kW, consumed by self-handler companies in premises and places other than homes.

The methodology adopted in this Report, in line with the work of EEA⁹⁰ (2015), is based on the assumption that, in the absence of incentives, the amount of electricity generated from renewable sources would be produced from the fossil fuel mix, resulting in the release of CO₂ into the environment.

Therefore, the CO₂ avoided emissions every year are calculated as the product of the electricity generated from plants that benefit from the exemption (data collected from the declaration of energy consumption) with the average annual emission factor by the national gross thermoelectric production, released by ISPRA's 2022 report⁹¹ equal to **495.0 gCO₂ /kWh in 2018, 462.2 gCO₂ /kWh in 2019, 449.1 gCO₂ /kWh in 2020 and 445.3 gCO₂ /kWh in 2021⁹².**

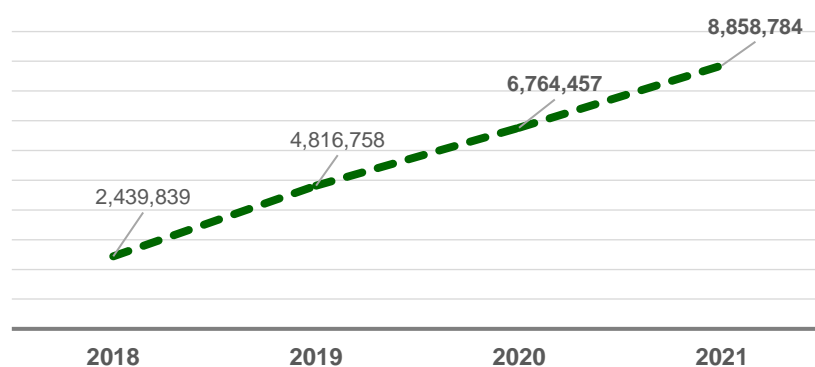
Therefore, if we assume that renewables have a zero emission balance and that, in the absence of energy produced from renewables, electricity produced from fossil fuels would have been used, the CO₂ emissions avoided for the years 2018-2021 are estimated to be equal to the values shown in Table 6. At a cumulative level, from 2018 to 2021, which is the period of time during which the measure was financed through the issue of green government bonds, it is estimated that the incentive measure avoided the emission of **8,858,784 tonnes of CO₂** (Figure 21).

Table 6: CO₂ avoided emissions (tonnes)

2018	2019	2020	2021
2,439,839	2,376,919 ⁹³	1,947,698	2,094,326

Source: Elaboration on GSE and Customs and Monopolies Agency data.

Figure 21: CO₂ avoided emissions (tonnes)



Source: Elaboration on GSE and Customs and Monopolies Agency data.

⁹⁰ EEA - European Environment Agency <https://www.eea.europa.eu>.

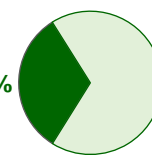
⁹¹ ISPRA Report - Efficiency and decarbonization indicators in Italian energy and power sector <https://www.isprambiente.gov.it/files2022/publicazioni/rapporti/r363-2022.pdf>

⁹² The annual emission factor is calculated excluding electricity produced from biodegradable waste, biogas and biomass of vegetable origin. Estimated value for 2021 (see ISPRA's 2022 report called 'Efficiency and decarbonization indicators in Italian energy and power sector').






⁹³ Value recalculated on the basis of the new estimated quantity of electricity for the year 2019.

10.2 Sustainable building and energy efficiency

47.46%



% 2019-2022 allocated resources

UN Sustainable Development Goals	EU environmental objectives				CATEGORY 2
  	 				Energy efficiency
Subcategories of eligible expenditure	2019	2020	2021	2022	Total
Tax benefits for energy efficiency in buildings	1,828,900	2,017,700	-	-	3,846,600

(values expressed in EUR thousand)

Tax deductions as an incentive measure for the energy requalification of the existing building stock were introduced by Law 296/2006.

The **Ecobonus**, which is a subsidy granted for expenses incurred for energy-efficiency interventions on buildings of any cadastral category, including rural buildings, is aimed at making existing buildings more efficient and encouraging energy-efficiency works, also with innovative technologies.

Over time, the measure has undergone various changes regarding the type of interventions allowed, the number of years over which the deduction is to be spread, and the deduction rate. In particular, the deduction rates vary according to the year in which the interventions were carried out and depending on whether they concern a single real estate unit or a condominium. Currently, the deduction is to be spread over 10 years.

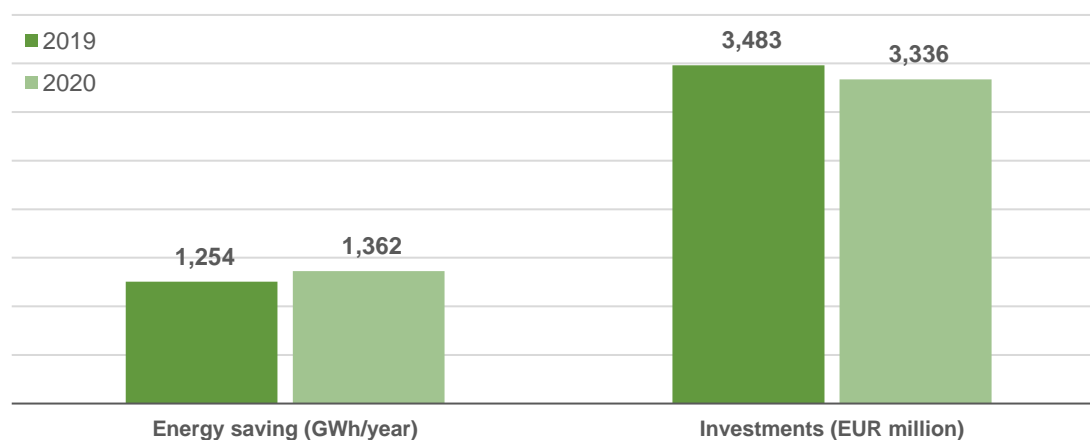
In terms of impact analysis⁹⁴, in 2020, thanks to energy efficiency measures, the total energy savings amounted to about **1,362 GWh/year**, and this confirmed the national trend set through the incentives deriving from the **Ecobonus** measure. As a matter of fact, further growth can be observed compared to what was recorded in 2019 (+8.6%), when this value had reached around **1,254 GWh/year** (+8.5% compared to the **1,156 GWh/year** obtained in 2018)⁹⁵. The impact on energy savings was accompanied by a slight decrease in activated investments, which exceeded EUR 3.3 billion in 2020, compared to approximately EUR 3.5 billion in 2019 (Figure 22).

The ability to achieve higher energy savings, even with lower investments can be partly explained by considering the portfolio of efficiency measures.

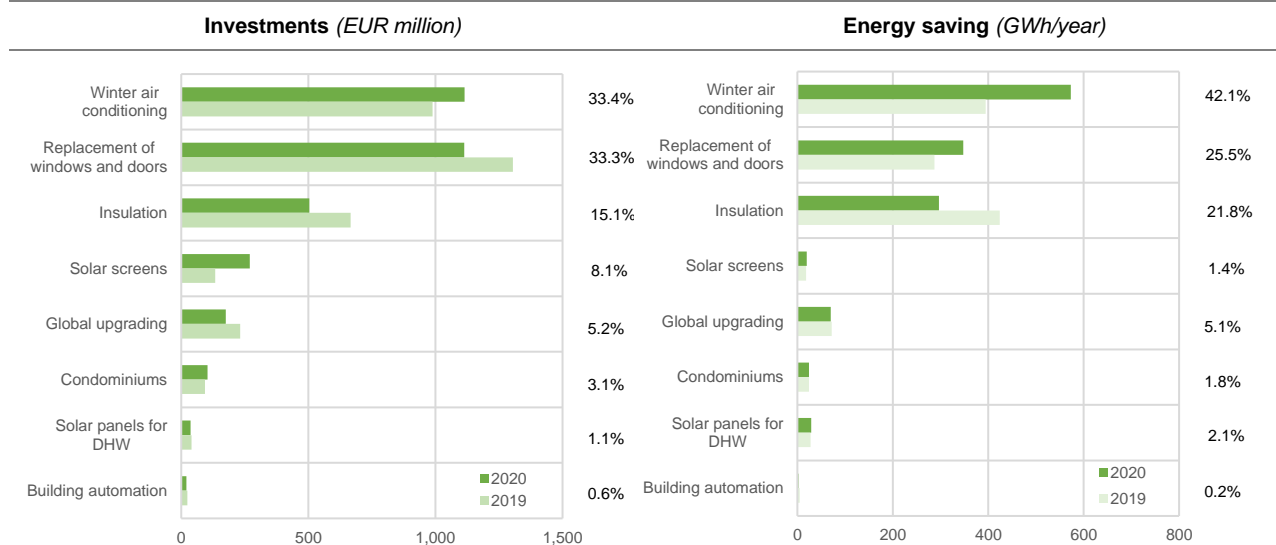
In 2020, the share of investments related to the replacement of the winter air-conditioning systems increased, and its contribution to energy savings was close to 42% of the total, about 11 percentage points higher than the previous year's result (Figure 23).

⁹⁴ The Ecobonus data presented in this paragraph refer to the following Enea Reports: <https://www.pubblicazioni.enea.it/le-pubblicazioni-enea/edizioni-enea/anno-2020/le-detrazioni-fiscali-per-l-efficienza-energetica-e-l-utilizzo-delle-fonti-rinnovabili-di-energia-negli-edifici-esistenti-rapporto-annuale-2020-dati-2019.html> and <https://www.pubblicazioni.enea.it/le-pubblicazioni-enea/edizioni-enea/anno-2021/le-detrazioni-fiscali-per-l-efficienza-energetica-e-l-utilizzo-delle-fonti-rinnovabili-di-energia-negli-edifici-esistenti-rapporto-annuale-2021-dati-2020.html>.

⁹⁵ As reported in the BTP Green 2022 Allocation and Impact Report.

**Figure 22: The main results of Ecobonus
(2019-2020)**


Source: Elaboration on 2020 and 2021 ENEA Report data.

**Figure 23: Energy efficiency actions*
(2019-2020) – % of the total in the box**


* Values sorted based on 2020 investments.

Source: Elaboration on 2020 and 2021 ENEA Report data.

The replacement of windows also led to an increase in energy savings, despite the value of investments decreased. In terms of energy efficiency, these interventions are characterised by their cost/effectiveness given by the ratio of cost incurred and energy savings (€/kWh) amounting to 10 euro cents per kWh of energy saved over the entire useful life of the intervention, that is one of the lowest among the different types (Table 7). Thanks to the use of higher-performance technologies, despite the reduction in expenditure, it resulted in improved energy savings.

Table 7: Useful life and cost effectiveness* by type of intervention
(2020)

Type of intervention	Useful life	Cost effectiveness (€/kWh)
Condominiums	30	0.12
Global upgrading	30	0.11
Insulation	30	0.08
Replacement of windows and doors	30	0.10
Solar screens	30	0.28
Solar panels for DHW	15	0.09
Winter air conditioning	15	0.18
Building automation	10	0.32

* Average over the years 2014-2020.

Source: Elaboration on 2021 ENEA Report data.

The **environmental performance** of this measure is monitored in terms of tonnes of CO₂ avoided annually⁹⁶.

As illustrated in Table 8, considering the time frame 2018⁹⁷-2020, the energy savings exceeded 920.000 tonnes of CO₂⁹⁸, that is equal to about 1% of the total emissions of the residential sector⁹⁹. This is a significant result considering that, in the three years analysed, the residential sector contributed to over 16% of the total CO₂ emissions in Italy.

Table 8: Environmental impact of the Ecobonus
(2018-2020)

	Energy saving GWh	CO ₂ avoided (tonnes)
2018*	1,156	283,414
2019	1,254	307,129
2020	1,362	333,631

* Cfr. Note 97.

Source: Elaboration on 2020 and 2021 ENEA Report data.

⁹⁶ The positive aspect of this indicator is that its contribution in terms of climate is pretty clear, with no particular difficulties in methodological and computational terms. For the purposes of estimating the indicator, the emission data reported in the greenhouse gas time series published annually by ISPRA was used. In particular, ISPRA's Inventory Report reports a specific emission factor (expressed in t.CO₂/TJ) for residential sector emissions related to energy consumption. The data reported by ISPRA (2021): "National Inventory Report 2021" - in tables 3.32 and 3.33 on greenhouse gas emissions and energy consumption estimated in Tera Joule of the residential sector for the historical series 1990-2019 - were used for the estimation. Greenhouse gas emission and fuel combustion data for the years 2018 and 2019 were considered in TJ, and subsequently converted into terawatt-hours. The energy savings achieved as a result of the investment in energy-efficiency works (for 2019 and 2020, 1,253.9 GWh and 1,362.1 GWh respectively) were multiplied by an emission factor determined by the ratio of CO₂ emissions from energy consumption in the residential sector to the amount of energy consumed. In order to make the calculation fully consistent in environmental terms, all emission sources in the residential sector were considered: liquid, gaseous and biomass fuels. This indicator, expressed in t CO₂/year avoided, was calibrated using ENEA data on energy savings for the years 2019 and 2020.

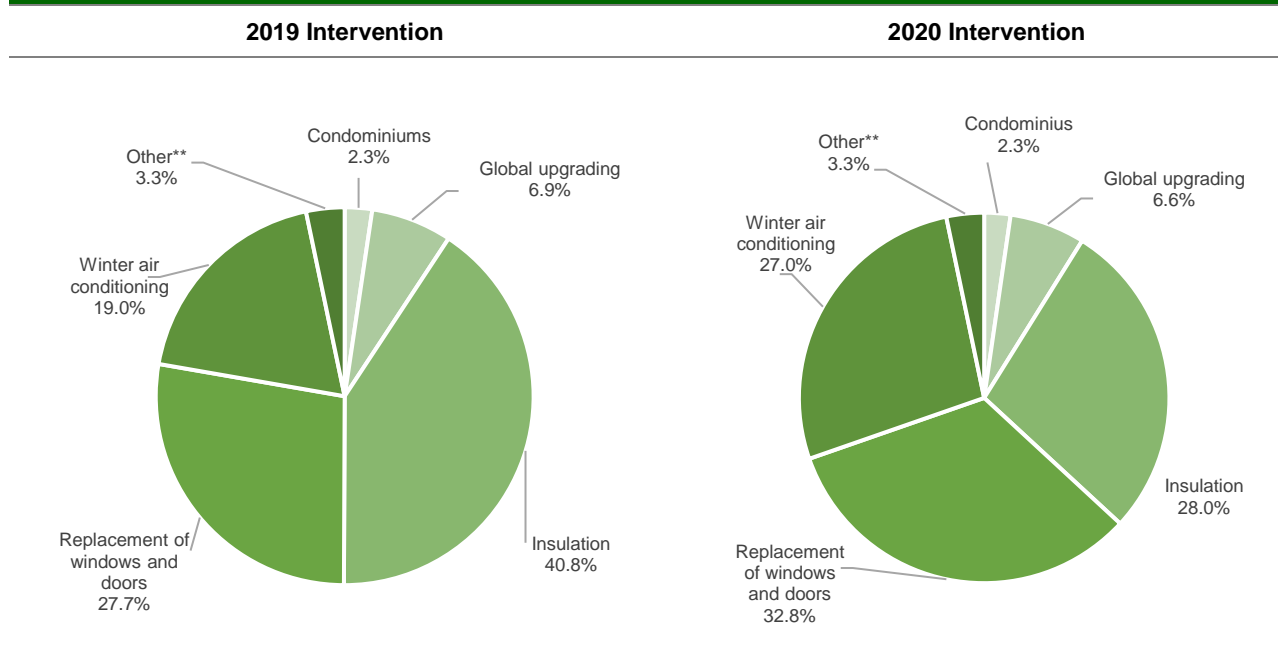
⁹⁷ The 2018 value reported in the last Allocation and Impact Report 2022.

⁹⁸ Over the same period, cumulative investments amounted to more than EUR 10 billion.

⁹⁹ Reference is made to data published by ISTAT on NAMEA Atmospheric Emissions (November 2022).

Taking into consideration the entire useful life of each energy efficiency intervention carried out in 2019 and 2020, and the relative amount of energy saved, it is also possible to estimate the beneficial effects of this measure in the long term. For the interventions started in 2019, the cumulative impact will be close to **7.6 million tonnes of CO₂ saved** over the entire useful life of the interventions to whom the measures on envelope insulation will significantly contribute to it with about 41% of the total (Figure 24). On the other hand, for the interventions started in 2020, a saving of just under **7.8 million tonnes of CO₂** is hypothesised, and it will be mainly favoured by the replacement of windows with about 33% of the total (Figure 24)¹⁰⁰.

Figure 24: Lifetime avoided t.CO₂ emissions per intervention*
% on total



* Cfr. Table 7 for details on useful life.

** Other: includes solar screens, solar panels for DHW and building automation.

Source: Elaboration on 2020 and 2021 ENEA Report data.

At the territorial level, it can be observed (Figure 25) that, in the two financial years being taken under account, the greatest contribution to reducing emissions came from the northern areas (over 70%), in which over 68% of investments were activated.

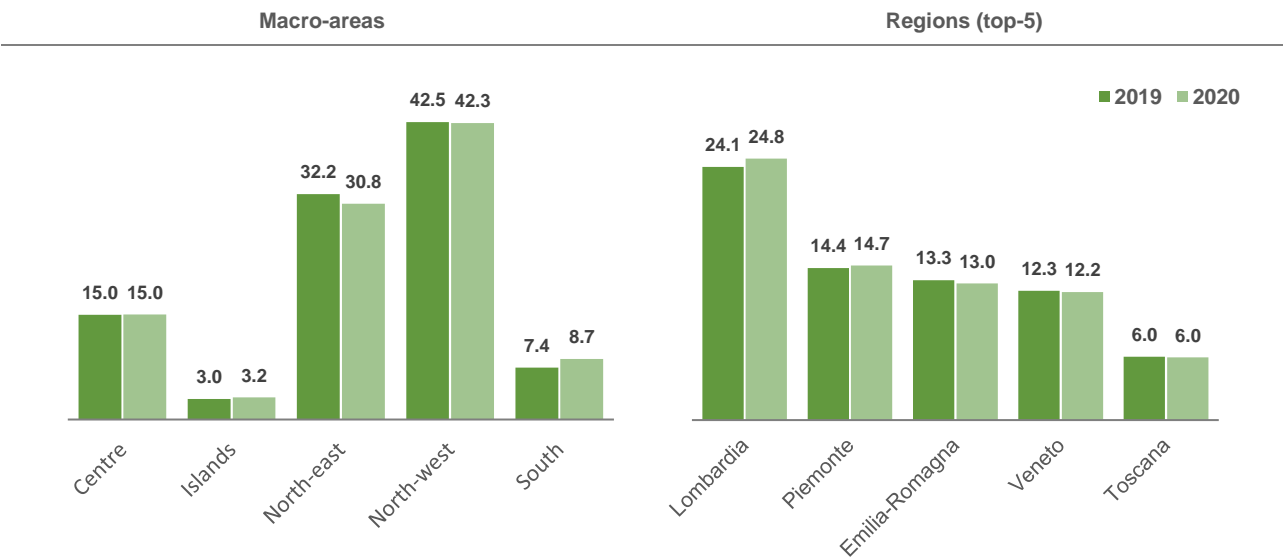
At provincial level (Figure 26), investments and the related energy savings/CO₂ reductions¹⁰¹ are mainly found in the northern provinces, with the exception of Rome¹⁰².

¹⁰⁰ If we consider the average life span for each year observed (approx. 24 years), it is possible to define an annual CO₂ abatement value that, in the long term, ranges between 321,000 and 327,000 tonnes avoided per individual intervention.

¹⁰¹ For this purpose, a normalised index that, on a scale between 0 and 1, expresses at a cumulative level (for the two-year period 2019-2020) the contribution of each province in terms of investments, energy savings and CO₂ was constructed. The following formula was used to construct the index: $Index(I_{i,p}) = [value X_{i,p} - \min(X_{i,tot})] / [\max(X_{i,tot}) - \min(X_{i,tot})]$, where $I_{i,p}$ represents the specific provincial index p , the value $X_{i,p}$ is the value of the individual items considered, and $\max(X_{i,tot})$ e $\min(X_{i,tot})$ respectively refer to the maximum and minimum value recorded in the national territory.

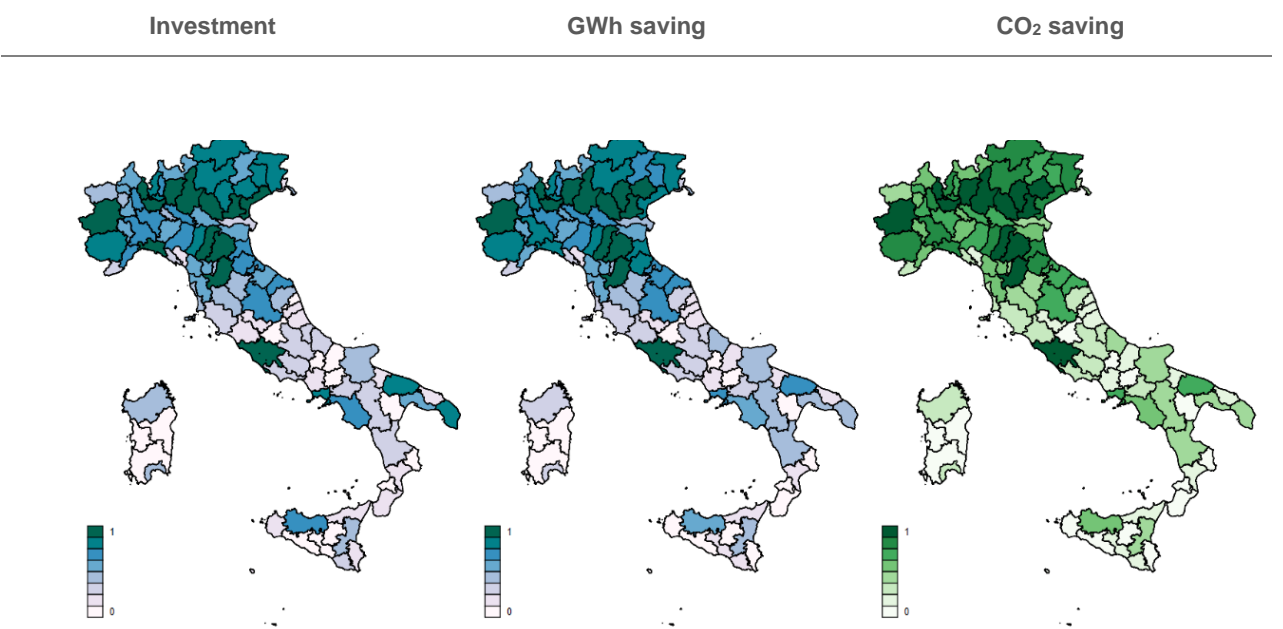
¹⁰² The provinces for which the largest contribution to CO₂ was observed were Milan, Turin, Rome, Brescia and Bologna (around 27% of the 2019-2020 cumulative savings).

Figure 25: Territorial contribution to CO₂ reduction
(2019-2020), % on total



Source: Elaboration on 2020 and 2021 ENEA Report data.

Figure 26: Cumulative impact of Ecobonus
(2019-2020), numero indice



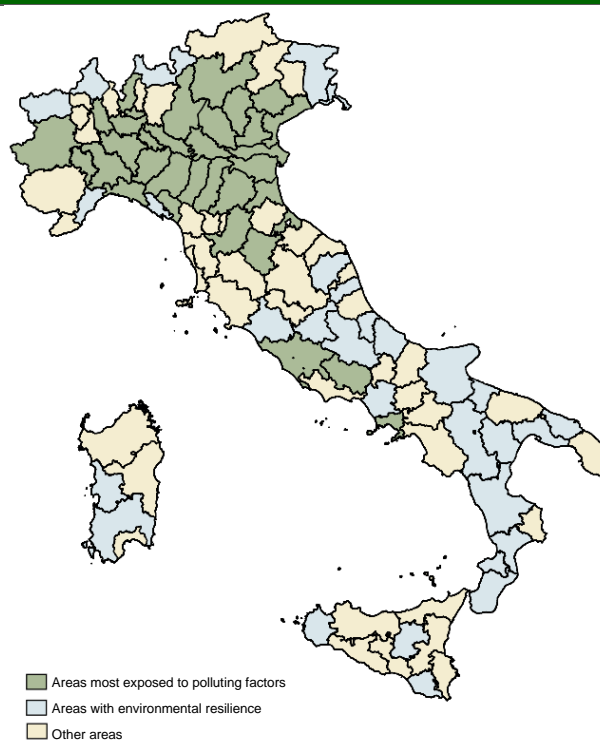
Fonte: Elaboration on 2020 and 2021 ENEA Report data.

Finally, it is interesting to highlight how the impact on CO₂ reduction can mainly be found right in the parts of the territory characterised by particularly significant levels of air pollution.

To highlight this, a clustering of Italian provinces was carried out¹⁰³, by taking into account the cumulative CO₂ savings index¹⁰⁴, an indicator of air pollution¹⁰⁵ and an index of resident population density¹⁰⁶. The procedure made it possible to define three partitions (Figure 27):

- **Areas most exposed to polluting factors** (number: 34): this group includes the provinces characterised by a higher level of pollution, also because they are areas with a high population density, which have benefited the most from the measure, thus contributing to a significant reduction in national CO₂ emissions (around 64%);
- **Areas with environmental resilience** (number: 31): this group includes provinces with low population density and low levels of atmospheric pollution that have benefited less from the interventions financed by the measure and have therefore also contributed less to CO₂ reduction;
- **Other areas** (number: 42): the provinces in this area currently have an average low level of air pollution. Nevertheless, the interventions carried out have produced a rather significant cumulative contribution to the abatement of CO₂, which - in the long term - could strengthen their feature as areas with a limited level of pollution.

Figure 27: Geographical relationships between Ecobonus benefits and air pollution
(location of the partitions resulting from the cluster analysis)



Source: Elaboration on Cerved, ISTAT and ENEA data.

¹⁰³ The objective is to measure the similarity/dissimilarity between the elements observed in the territories and then cluster them into groups with uniform characteristics. The technique used is that defined as k means cluster analysis, which - through an iterative process - assigns each observation to the group with the closest mean.

¹⁰⁴ See footnote 101.

¹⁰⁵ This is an indicator produced by Cerved, which, starting from provincial ISTAT BES data, collects information on air quality monitoring, PM10 concentration, days exceeding the PM10 threshold, NO₂ concentration, days exceeding the NO₂ threshold and days exceeding the O₃ threshold. For further details see the report Sustainable Italy (2022): <https://research.cerved.com/rapporti/rapporto-italia-sostenibile-2022/>.

¹⁰⁶ The index, referring to the resident population surveyed by ISTAT in 2020, is constructed using the same methodology as presented in footnote 101.

11 Climate change adaptation



Climate and environmental risks are one of the main threats for the coming decade, particularly in view of the difficulties in achieving the Paris target of keeping atmospheric warming within one and a half degrees Celsius.

For this reason, it is every day more important to increase investment not only in **climate change mitigation** – in line with the EU strategy to achieve climate neutrality by 2050 – but also for the improvement of the adaptation of buildings, production units, households infrastructure and cultural assets to climate change, increasing their long-term resilience and preparing for the current and future effects of phenomena such as sea-level rise or extreme weather events (e.g. heat waves, droughts, tornadoes, storms, etc.).

In spite of Europe's commitment to reduce global net emissions to zero by 2050, this will not be enough to halt the progressive increase in greenhouse gas concentrations in the atmosphere, resulting in higher average temperatures on a global scale.

For Italy, too, **climate challenges are one of the main topics of attention, considering the country's location and its geomorphologic and social characteristics**. As a matter of fact, Italy is located in an area that is particularly vulnerable to the effects of climate change (the so-called 'Mediterranean hot spot')¹⁰⁷ and is characterised by a high exposure to natural hydrogeological risks (i.e., landslides, floods, coastal erosion) and by a high degree of urbanisation of some areas - often located near the sea - against a progressive depopulation of other areas of the country (i.e., rural or inland areas).

It is evident how important it is to implement **adaptation actions throughout the country**, both with planning and management activities, including through climate vulnerability analyses and adaptation plans, and with measures to strengthen the capacity of buildings, businesses and households to cope with expected climate changes. It is also necessary to improve the country's ability to promptly react to catastrophic events and climate hazards, reducing their negative impacts in terms of human lives¹⁰⁸, losses for productive activities, biodiversity and potentially irreversible damage to the cultural heritage¹⁰⁹.

Through the financing of hydrogeological risk mitigation measures and the implementation of safety measures for territories, **BTP Green** contributes to the strategic framework for climate adaptation, as recently outlined in the proposed **National Climate Change Adaptation Plan**¹¹⁰, drafted by the Italian Ministry of the Environment and Energy Security, in accordance with the 2021 European Adaptation Strategy¹¹¹.

¹⁰⁷ See *Intergovernmental Panel on Climate Change (IPCC), Assessment Report No. 6; Intergovernmental Panel on Climate Change (IPCC), Assessment Report No. 5*; European Environment Agency (EEA) 2012.

¹⁰⁸ "Periodic Report on the Risk posed to the Italian population by Landslides and Floods - Year 2022" by CNR IRPI.

¹⁰⁹ Considering even medium-low risk scenarios, 18% of Italy's architectural, monumental and archaeological assets are exposed to landslide risk and 23% to flood risk. Source: ISPRA, "Landslides and floods in Italy: hazard and risk indicators", 2021 Edition, Report 356/2021, December 2021.







¹¹⁰ Italian Ministry of the Environment and Energy Security, National Climate Change Adaptation Plan, January 2023 version.

¹¹¹ COM (2021) 82 final of 25 February 2021, <https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:52021DC0082&from=IT>

11.1 Soil protection and hydrogeological disaster mitigation

0.68%

% 2019-2022 allocated resources

UN Sustainable Development Goals					EU environmental objectives		CATEGORY 5		
						Protection of the environment and biological diversity			
Subcategories of eligible expenditure					2019	2020	2021	2022	Total
Soil protection and interventions against hydrogeological instability					-	-	-	55,214	55,214

(values expressed in EUR thousand)

Hydrogeological instability is an issue of particular relevance, in view of the significant impacts it has on the various fields of Italy's socio-economic and environmental system (i.e., population, buildings, cultural heritage, infrastructures, enterprises). Therefore, addressing the issue of hydrogeological instability is one of the most relevant elements in the country's climate change adaptation initiatives.

BTP Green supports the country's fight against hydrogeological instability by financing, on the one hand, the **management plans of Basin authorities**¹¹² - elements of defence and protection of the water resource and the territory - and, on the other hand, **interventions to secure the territory in order** to minimise losses and damage due to climate changes.

Hydrogeological instability is an issue of particular relevance not only in Italy: the European Union's Joint Research Centre reports that extreme weather events are more likely to cause hydrogeological consequences in the Mediterranean (and particularly in Italy) and Alpine regions than in northern Europe¹¹³.

The national territory presents an inherent **propensity to instability**, due to the peninsula's own characteristics in terms of weather-climate, topography (75% mountainous-hilly) and the geological properties of the subsoil. There is also the issue of the anthropisation of the country, with a population density of about 200 inhabitants per km², rich in urban nuclei (almost 60 thousand) and infrastructures. As a matter of fact, for every 100,000 inhabitants there are 12 kilometres of motorways, 28 kilometres of railways and 608 kilometres of main roads¹¹⁴.

Internal migratory flows and the demographic dynamics of recent years are also exacerbating risk situations: increasingly densely populated urban areas (man-made surfaces have risen from 2.7% in the 1950s to 7.1% in 2020) and the concurrent progressive abandonment of rural, mountainous and hilly areas, with a consequent reduction in the levels of protection and maintenance of those territories.

¹¹² Law 183/89 identifies the river basin as 'the inseparable physical unit' on which to operate with actions aimed at the protection, safeguard and enhancement of existing resources. In Italy, there are 7 hydrographic districts (consisting of one or more basins) for which it is necessary to draw up the management plan identified by Law 221/2015, in force since 2 February 2016: Eastern Alps; Po Valley; Northern Apennines; Central Apennines; Southern Apennines; Sardinia; Sicily. The adoption of the management plans is delegated to the Permanent Institutional Conferences of the District Basin Authorities, integrated by components of the regions whose territory falls within the district to which the plan refers.

¹¹³ See in particular the map of rainfall erosion potential (*Rainfall Erosivity in the EU and Switzerland - R-factor*) drawn up by the European Commission's Joint Research Centre (*European Soil Data Centre - ESDAC*), in which Italy is the country with the highest rainfall erosion factor (above 1,300 MJ mm/ha yr), both currently and in the 2050 scenario.

¹¹⁴ Istat data, *Noi Italia* 2022.

According to ISPRA's data, in general, **almost all Italian municipalities (about 94%) are exposed to the risk¹¹⁵ of landslides, floods and/or coastal erosion.** In terms of population, about 1.3 million inhabitants (548 thousand households) are at risk of landslides and about 6.8 million (2.9 million households) at risk of floods. The most exposed regions in terms of population are Emilia Romagna, Tuscany, Campania, Veneto, Lombardy and Liguria regions.

In fact, in Italy, **landslide phenomena** are highly common, frequent and often highly destructive (28% with rapid kinematics). Just bear in mind that, of the approximately 900,000 landslides surveyed in the databases of European countries¹¹⁶, almost two thirds are contained in the Inventory of Landslide Phenomena in Italy¹¹⁷ (equal to over 625,000 events over an area of almost 24,000 km², i.e., almost 8% of the national territory).

The **risk of flooding** is also widespread, with almost 30% of the national territory affected by such phenomena: 5.4% of the territory at high danger of flooding, 10% at medium danger and 14% at low danger (assessed using the probability scenarios¹¹⁸ provided by Article 6 of the EU Floods Directive¹¹⁹). According to the European Environment Agency (EEA), the number of European cities classified as vulnerable to flooding amounts to approximately 20%.

The national production system is highly exposed to hydrogeological risk. According to the CERVED analysis¹²⁰ on the physical risk of companies - by cross-referencing information on the locations of Italian companies (location) with the ISPRA maps - the following results come out (**Errore. L'origine riferimento non è stata trovata.**). With reference to companies located in **landslide risk** areas: 3% of production units (2% of employees) are exposed to a high or very high risk; 5% of production units (4% of employees) are exposed to a medium risk; 92.5% (94% of employees) are exposed to a low or very low risk. With reference to companies located in **flood risk** areas¹²¹: 8.8% of production units (10.2% of employees) are exposed to a high or very high risk; 11.4% of production units (12.6% of employees) are exposed to a medium risk; 79.8% (77.2% of employees) are exposed to a low or very low risk.

By combining the risk of landslides and floods, it is also possible to locate the Italian businesses that are more likely to be exposed to changes in temperature or climatic conditions. In general, according to the Cerved analysis, of the more than 5.3 million businesses operating in the Italian production system, the number at risk of phenomena related to climate change exceeds 550,000 businesses, with more than 2 million workers. The most exposed areas are the north-eastern part of Italy and Liguria (Figure 29).

¹¹⁵ Risk is defined as the product of the following parameters: danger, i.e., the probability that a certain damaging event will occur in a given area with a given intensity and frequency (return time); vulnerability, which concerns the ability to counteract the event; and exposure, which is linked to the so-called value of the exposed element (in terms of human lives, economic data, cultural heritage, etc.).

¹¹⁶ Herrera G., Mateos R.M., García-Davalillo J.C. et al. (2018), "Landslide databases in the Geological Surveys of Europe", Landslides, Vol. 15, pp. 359-379 (EUROGEOSURVEYS).

¹¹⁷ As part of the cognitive activity of collecting, processing and disseminating data on soil protection and hydrogeological instability, regulated by Articles 55 and 60 of Legislative Decree 152/2006 'Environmental Regulations', ISPRA carries out, in collaboration with the Regions and Autonomous Provinces, the Inventory of Landslide Phenomena in Italy (IFFI) (Art. 6, paragraph g of Law 132/2016). The Inventory censuses landslides occurring on the national territory according to standardised methods.

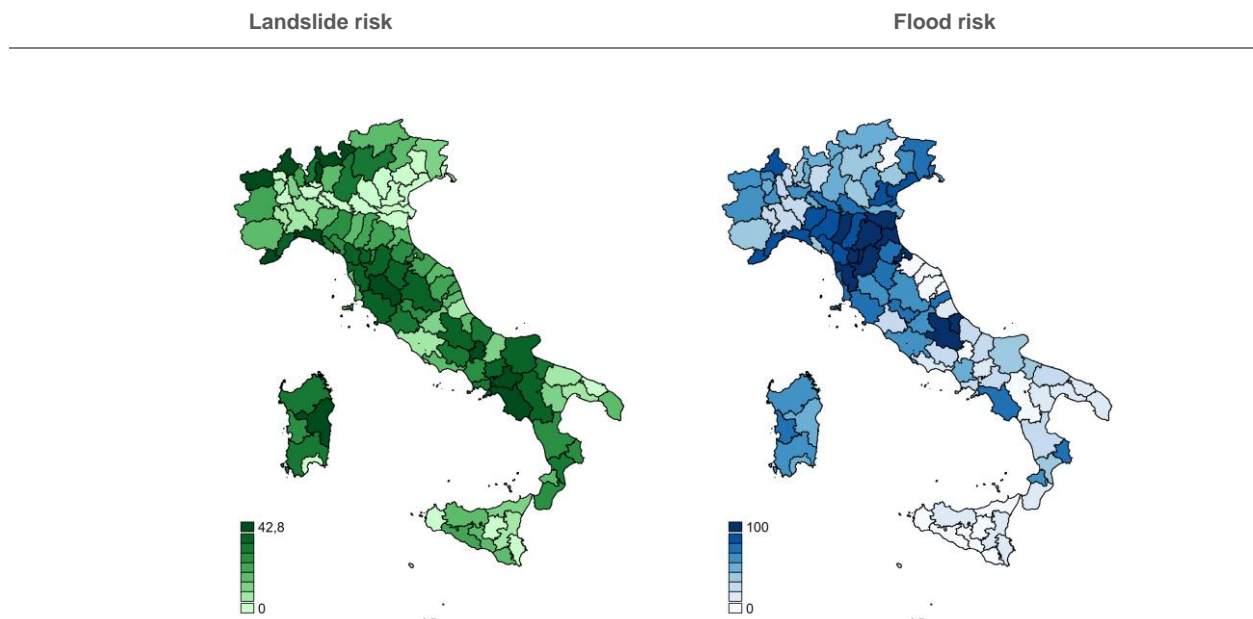
¹¹⁸ Probability scenarios provided for by Article 6 of the Floods Directive (Directive 2007/60/EC of 23 October 2007 transposed in Italy into Legislative Decree 49/2010): High Probability Hazard (HPH - high probability of flooding); Medium Probability Hazard (MPH - medium probability of flooding); Low Probability Hazard: (LPH - low probability of flooding). In accordance with the provisions of Legislative Decree 49/2010, these scenarios correspond to the areas that can be flooded as a result of flooding events with return times between 20 and 50 years (HPH - high probability or frequent floods); with return times between 100 and 200 years (MPH - medium probability or infrequent floods); with return times greater than 200 years (LPH - low probability or extreme event scenarios).

¹¹⁹ Directive 2007/60/EC of 23 October 2007 on the assessment and management of flood risks (Floods Directive), transposed into national legislation by Legislative Decree 49/2010. With the Decree transposing the Directive, the District Basin Authorities are in charge of planning, while the Regions (in coordination with the National Civil Protection) are in charge of the preparation of the part of the Flood Risk Management Plan regarding the warning system for hydraulic risk, and they are still in charge of its implementation.

¹²⁰ Cerved, Sustainable Italy Report 2022, 30 June 2022

¹²¹ That is, temporary flooding due to overflowing of the banks of rivers, streams, other watercourses, lakes or the sea.

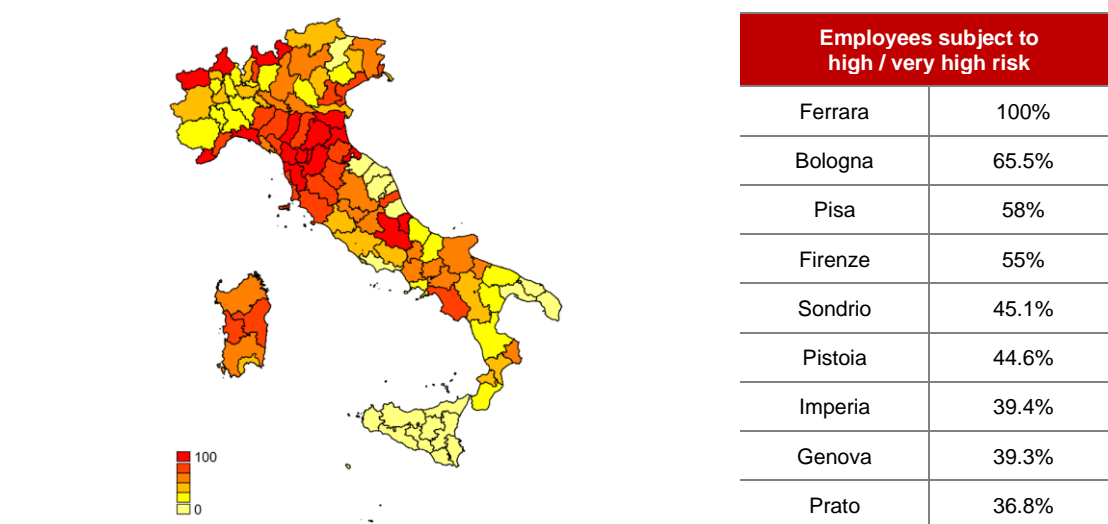
Figure 28: Distribution of production units and employees exposed to landslide and flood risk by province
 Index of exposure to landslide and flood risk. Risk classes from 0 (no risk) to 100.



Source: Sustainable Italy Report, Cerved (2022)¹²².

Figure 29: Distribution of production units and employees exposed to physical risks related to climate change by province

Index of exposure to the risk of intensification of phenomena related to climate change (landslides and floods)¹²³.
 Risk classes from 0 (no risk) to 100.



Source: Sustainable Italy Report, Cerved (2022)¹²⁴

¹²² Cerved, Rapporto Italia Sostenibile 2022, 30 giugno 2022.

¹²³ A synthetic index restricted to the components of physical risk related to floods and landslides, used as a measure of the degree of exposure of companies to the possible intensification of phenomena associated with climate change. See Cerved, Sustainability Report 2022.

¹²⁴ Cerved, Sustainability Report 2022.

The situation of the coasts shall be discussed separately, both because of their unique exposure to instability and because of the effects of the progressive change in the sea level, which, together with the subsidence phenomena, lead to a **progressive retraction of the coasts** of Italy. In addition to this, there are greater risks associated with the high degree of urbanisation of these areas (with the relative greater density of population, socio-economic activities¹²⁵ and infrastructures) and the high presence of wetlands and coastal lagoons¹²⁶, which are relevant to the health of ecosystems and biodiversity¹²⁷.

Therefore, particular attention shall be paid to the impact of climate change on the approximately 8,000 km of Italian coastline, almost 60% of which consists of low-lying coastlines, mostly sandy or gravelly shorelines, which are more vulnerable to variation of the sea level, geomorphological degradation and erosion. As a matter of fact, **18% of the national coastline is undergoing erosion, despite the progressive implementation of rigid defence works on stretches of coast**¹²⁸, resulting in the retraction of beaches and greater exposure to flooding phenomena and the destructive effects of intense rainfall events or flash floods for inland areas located next to coasts.

The data available on hydrogeological instability highlight how fragile Italy's territory is. Therefore, it is essential to allocate part of the proceeds from the issue of green government bonds to actions aimed at fighting this phenomenon. In this regard, it should be noted that the following amounts have been allocated for this category of expenditure: **EUR 457 million** over the 2018-2021 period, referring to issues of the **2045 BTP Green** that occurred in 2021; **EUR 55 million** over the 2019-2022 period, referring to issues of the **2035 BTP Green** that occurred in 2022. It is important to highlight that interventions aimed at mitigating the hydrogeological risk are also included in the NRRP, financed by the RRF, hence not all this kind of measures implemented by the State can be included in the expenses financed through **BTP Green** proceeds.

The financed interventions mainly concerned: *i)* structural measures aimed at the construction and maintenance of works to control hydrogeological processes (such as, for example, hydraulic works and drainage, bridges and maximum flow dams, diversion or containment works, walls to counter landslide events, etc.); *ii)* non-structural measures based on the reorganisation of land use, through an in-depth knowledge of its characteristics and proper planning, consistent with the regulatory and governance framework; *iii)* forest management activities; *iv)* activities in the agricultural field, e.g. related to irrigation activities; *v)* monitoring and warning systems, which help to ensure a better management of emergency events, with a more timely response and a consequent minimisation of damages and losses.

¹²⁵ About 30% of the Italian population lives permanently in coastal municipalities, with a density twice the national average.

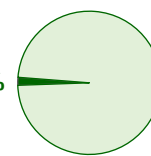
¹²⁶ 32% of the 1,511 wetlands and 33 of the 57 Ramsar sites surveyed in Italy are marine and coastal environments.

¹²⁷ See in particular the 1971 Ramsar Convention on Wetlands and the Convention on Biological Diversity of the United Nations Conference on Environment and Development signed in Rio de Janeiro in 1992.










¹²⁸ Compared to the period 2000-2007. Source ISPRA, "Landslides and floods in Italy: hazard and risk", 2021 Edition, Report 356/2021, December 2021.

11.2 MO.S.E system and safeguarding of the Venetian lagoon

1.82%



% 2019-2022 allocated resources

UN Sustainable Development Goals					EU environmental objectives				CATEGORY 5
									Protection of the environment and biological diversity
Subcategories of eligible expenditure					2019	2020	2021	2022	
MO.S.E and safeguarding of the Venetian lagoon					-	-	-	147,436	147,436

(values expressed in EUR thousand)

In line with what has already been written in the last Allocation and Impact Report 2022, referring to the years 2018-2021, also for 2022 it was decided to take into account the MO.S.E. system among the green projects financed through the proceeds from green government bonds issues.

The MO.S.E system for the protection of Venice and the safeguarding of the Venetian lagoon is now in the crucial phase of finalisation. Although not yet completed (90% complete¹²⁹), in recent years the system has fulfilled its role of physical protection of the territory with the morphological rebalancing of the entire lagoon ecosystem.

After the first test on floodgates raising carried out on 10 July 2020, the infrastructure continued to operate in provisional mode, protecting Venice and its lagoon during the 2021-2022 season with 13 circumstances in which water was 130 centimetres above sea level. In the 2022-2023 season, the barriers were raised on further 16 occasions, when the peak of the tide together with the power of the wind indicated the need to safeguard the city, thus showing the perfect functioning of the structure even in highly critical conditions.

In line with the guidelines of the Italian Ministry of the Environment and Energy Security, an improvement project, which had not been foreseen in the original project, was initiated for the **construction of a photovoltaic system** that will be able to guarantee the continuous annual consumption of the infrastructure. The objective is to minimise the supply of electricity from the grid and maximise the production of electricity with photovoltaics for the use of MO.S.E. and for feeding energy into the city grid. As a matter of fact, during most of the production hours, the discontinuous character of photovoltaic energy production generates a surplus compared to the actual load, while there is no availability of energy during the hours of non-operation or minimum irradiation. Therefore, the surplus energy will be fed into the city grid, while the energy needed during non-productive hours will be purchased from the grid operator. The planned plant capacity is equal to: **10 MWp for Bocca di Lido, 1.8 MWp for Bocca di Malamocco and 1.4 MWp for Bocca di Chioggia, for a total of 13.2 MWp.**

¹²⁹ <https://www.mosevenezia.eu/non-solo-mose/>

12 Sustainable mobility



According to data from the European Environmental Agency, transports are responsible for more than 25% of the EU's greenhouse gas (GHG) emissions and are a major contributor to climate change.

This applies to **Italy** too, where the transport sector is responsible for more than 25% of total national greenhouse gas emissions, of which more than 90%¹³⁰ comes from road transport, that is higher than the EU average where road transport accounts for 77% (including national transport and international bunkering¹³¹ in 2020)¹³². **On the other hand, only 0.1% of Italian greenhouse gas emissions are related to rail transport**, considering that its fleet mainly consists of electrically-driven trains.

At national level, road transport is also responsible for a significant share of air pollution, even though it is partially improving as a result of technological innovations introduced in vehicles. This is especially true in urban contexts, due to the contribution of circulating vehicles to nitrogen oxide emissions¹³³ (which, in addition to exceeding NO₂ levels, lead to the formation in the atmosphere of PM₁₀ and, during the summer, ozone) and direct emissions of primary PM₁₀.

Given the sector's relevance in terms of total emissions, **transport is a key pillar in achieving the EU's goal of climate neutrality by 2050**, in such a way that the European Green Deal sets a target of a 90% reduction in greenhouse gas emissions from traffic by 2050¹³⁴.

In addition to climate change, transport also has a significant impact on air pollution, with major environmental and health impacts, given the pressures that emitted pollutants exert on air quality¹³⁵.

In order to support the reduction of pollutant and climate-changing emissions¹³⁶, the EU strategy includes actions to **support a modal shift** towards more sustainable means of transport, including rail transport, alongside actions to decarbonise road transport and reduce the intensity of the emission of solid fuels¹³⁷.

¹³⁰ ISPRA 'Emissions from road transport in Italy', April 2021.

¹³¹ Fuel supply for ship and aircraft propulsion.

¹³² European Environment Agency (EEA), 2019

¹³³ As a matter of fact, road traffic is the first source of nitrogen oxides, accounting for more than 40% of NO_x emissions, largely attributable to diesel vehicles, especially commercial and heavy-duty industrial vehicles (the latter are more present on extra-urban roads and motorways). Source: ISPRA 'Emissions from road transport in Italy', April 2021.

¹³⁴ European Environment Agency (EEA) 'Trends and projections in Europe 2019 - tracking progress towards Europe's climate and energy targets', EEA Report, 15/2019.

¹³⁵ The air quality Directives (2008/50/EC and 2004/107/EC), which are currently being revised, set limits or target values for concentrations of pollutants in the air, while the NEC Directive (National Emission Ceilings - EU Directive 2016/2284) sets emission reduction commitments on total national emissions for five air pollutants (NO_x, SO₂, NMVOC, NH₃ and PM_{2.5}).

¹³⁶ Between 1990 and 2020, EU-27 transport-related emissions of nitrogen oxides (NO_x) decreased by 53%, sulphur oxides (SO_x) by 77%, carbon monoxide (CO) by 89%, methane (CH₄) and non-methane volatile organic compounds (NMVOCs) by 76% and 90% respectively. At the same time, between 2000 and 2020, particulate emissions (including non-exhaust emissions) from transport in the EU-27 with a particle diameter of 10µm/2.5µm or less (PM₁₀, PM_{2.5}) decreased by 49% and 55%, respectively. In contrast, ammonia emissions (NH₃) in transport increased by 99% (139% over the period 1990-2019) over the same period, while nitrous oxide (N₂O) increased by 16% (38% over the period 1990-2019). Road transport in particular has significantly reduced its pollutant emissions, with the exception of the compounds NH₃ and N₂O. Their recent increase is mainly due to new catalytic systems for reducing NO_x. For PM, the reductions are smaller, due to an increase in non-exhaust emissions such as those from brakes and tyre abrasion, which, however, are set to increase with the decarbonisation of transport due to the increase in vehicle mass due to batteries.

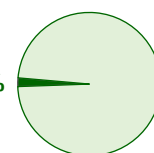
¹³⁷ As stipulated in the EU Fuel Quality Directive 98/70/EC, which set a 6% reduction by 2020, compared to 2010 levels. In 2018, the average fuel emission intensity in the EU was 3.7% lower than in 2010, and in 2019, a reduction of 4.3% was achieved. For 2020, a reduction of 5.5% compared to 2010 levels was achieved.

This calls for multiple measures at national level, also in consideration of the growing average volumes of passenger and freight transport, which are closely correlated with economic growth trends¹³⁸.






With the aim of contributing to a sustainable mobility system and reducing the environmental and climate-related external effects, **BTP Green** has financed capital investments to upgrade subway lines and railway lines (both HS/HC and non-HC) and measures to support passenger and freight rail traffic.

12.1 Measures to support rail freight transport

1.98%



% 2019-2022 allocated resources

UN Sustainable Development Goals			EU environmental objectives				CATEGORY 3
					Transport		
Subcategories of eligible expenditure			2019	2020	2021	2022	Total
Rail freight transport subsidies			-	-	-	160,597	160,597

(values expressed in EUR thousand)

In line with the past allocation, part of the proceeds from the issue of green government bonds was allocated to the granting of subsidies to railway companies in order to provide incentives for rail freight transport rather than more polluting modes of transport. In particular, as described in section **Errore. L'origine riferimento non è stata trovata.**, the financing of both the **STFM measure** (with **0.75% of the total resources** allocated) and the **“Ferrobonus” measure** (with **1.23% of the total resources** allocated) continues also for 2022. In particular, this section presents the environmental impact analysis with respect to the rail freight support measure (STFM).

The reference regulatory framework of the STFM measure¹³⁹ grants for the railway undertakings a **contribution proportional to the train-kilometres carried out** on the National Railway Infrastructure (NRI), aimed at compensating *i) the additional costs incurred for the use of the infrastructure to and from the south* and for the **ferrying of goods trains** and *ii) a share of the external costs saved* (over the entire national territory) with respect to the other, more polluting modes of transport.

The analysis of the **environmental impacts** related to the rail freight support measure (**STFM**) is conducted in continuity with the methodology adopted in the previous Report. It is aimed at assessing the amount of the main environmental external effects avoided thanks to the modal diversion of a share of freight traffic demand from the more polluting road mode to the less polluting rail mode.

¹³⁸ Between 2000 and 2019, transport demand in Europe grew by 20% for passenger traffic and 22% for freight traffic. The most polluting means of transport also increased, with road traffic alone increasing by 18% and air traffic by 86%. Data from the European Environmental Agency, Transport and Mobility, updated in 2023.

¹³⁹ The measure, introduced by Law No. 190, Article 1, paragraph 294 of 23 December 2014, was authorised by the European Commission by Decision C(2016)8480 final for the years 2015, 2016, 2017, an authorisation then extended to the years 2018 and 2019 by European Commission Decision C(2017) 7279 final of 25/10/2017, and, lastly, to the years 2020, 2021 and 2022 by Decision C(2019) 8217 final of 15 November 2019. Article 47, paragraph 11-ter3 of Decree-Law No. 50 of 24 April 2017, converted with amendments by Law No. 96 of 21 June 2017, extended the measure for the two-year period 2018-2019 under the same terms and conditions. Article 1, paragraph 297 of Law No. 145 of 30 December 2018 extended the measure for the three-year period 2020-2022 under the same terms and conditions defined by Interministerial Decree 566/2020.

Despite a period of modest national economic growth, rail cargo recorded an increase of more than 20% between 2014, the year in which the law was introduced, and 2022 in terms of train-km travelled on the NRI, rising to almost 50% on routes to/from the South of the peninsula (the area most affected by the STFM measure). This positive trend also affected the two-year period 2020-2021, with a slight decrease of only 3% due to Covid in 2020 and a subsequent rebound of more than 13% in 2021, followed by a levelling off in 2022 (approximately +4%).

To calculate how the financed intervention affected rail freight traffic, reference was made to the estimates of the Italian Ministry of Infrastructure and Transport in the Measure Reports¹⁴⁰. In particular, in the first years after the regulation came into force (2015-2016), rail freight traffic in the regions from/to the South grew more than in the rest of Italy¹⁴¹. In a context of substantially homogeneous economic trends in the different macro-areas, it is conceivable that the dynamic is attributable to the law effects. Based on this assumption, the **elasticity¹⁴² of railway demand** for the grant was calculated, conceived as marginal reduction in operating costs.

This estimate was then used to calculate the change in demand for freight traffic attributable to the subsidy in the years following the two-year period 2015-2016, assuming a uniform elasticity on all rail routes and a homogeneous evolution of rail demand throughout the territory in the absence of the subsidy. In this way, it was estimated that the impact of the STFM measure was equal to more than additional **30 million train-km** in the 2014-2022 period¹⁴³, with respect to the basic scenario without the rule (Figure 30), against a **contribution of approximately EUR 100 million for 2022 alone¹⁴⁴**, in line with the annual allocation of the measure, with the exception of 2021 when the contribution was almost double the average for the 2018-2022 period.

In addition to the increase in mileage (+13.5% in terms of train-kilometres), there was also an increase in the average weight per train of goods transported (+14.9%) and in the number of trains (+10.2%)¹⁴⁵. It can be deduced that the measure introduced has led to a general increase in the 'competitiveness' of rail freight transport, with more trains travelling longer distances and handling more goods.

The estimate of **impacts** on traffic allows the **environmental impacts to be** assessed, assuming that the increase in rail freight traffic in the years of implementation of the rule is mostly due to the **modal shift from road transport**.

This is consistent with the increased share of rail cargo in inland transport (road + rail + inland waterways), which has led to a narrowing of the gap with the European average by 2 percentage points since 2014¹⁴⁶.

¹⁴⁰ Methodology adopted by the Italian Ministry of Infrastructure and Transport, Reports on the Support Measure for Rail Freight Transport (STFM) Article 1, paragraph 294, Law No. 190 of 23 December 2014, Section 2.10, paragraph 53, European Commission Decision C(2016) 8480 final of 19/12/2016.

¹⁴¹ The differential in the growth of rail freight traffic between the macro-area 'south and islands' and the rest of Italy was approx. 12% in 2015 and 5% in 2016. Source: Italian Ministry of Infrastructure and Transport, 2020 Report on the Support Measure for Rail Freight Transport (STFM).

¹⁴² Elasticity of rail demand is defined as the percentage change in demand induced by a contribution of 1% of the total operating costs. This is calculated using the formula: $e = (\Delta d / d) / [C_{nm} / (C_E * d)]$ with: Δd = train – kilometre induced by STFM measure; d = train – kilometre in the absence of STFM contributions; C_{nm} = STFM contribution; C_E = operating costs of freight railway undertakings.

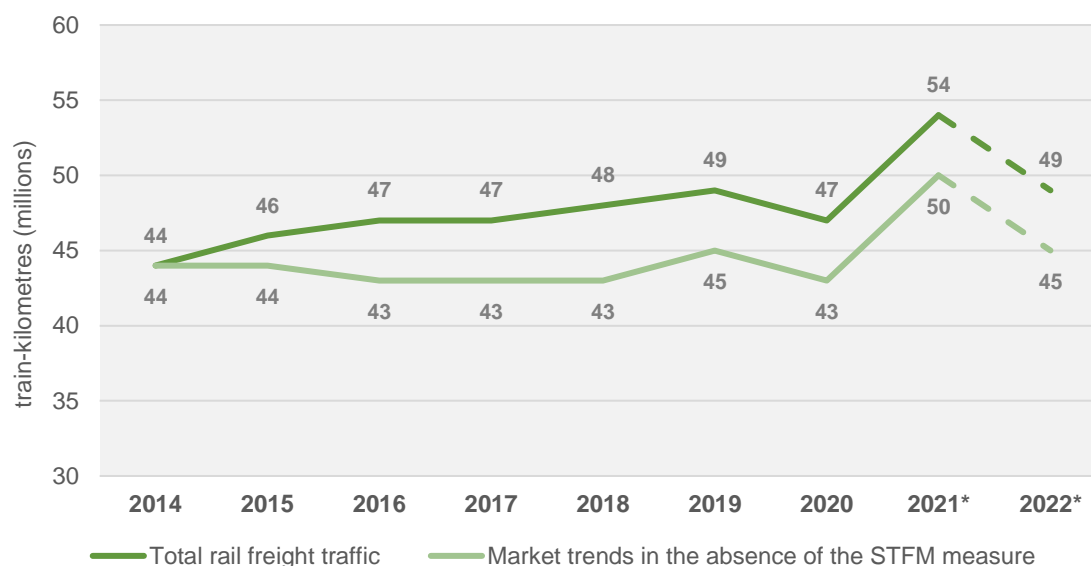
¹⁴³ Assuming an overall contribution share allocated for 2022 similar to that allocated annually in the three-year period 2019-2021.

¹⁴⁴ For the period 2018-2022 the financing of the STFM measure through the issue of BTP Green amounted to EUR 504 million. In 2022 only, the amount allocated to the STFM measure alone was EUR 99.9 million.

¹⁴⁵ Source: Italian Ministry of Infrastructure and Transport, 2020 Report on the Rail Freight Support Measure (STFM).

¹⁴⁶ The incidence was 13.3% in 2021. Eurostat data – modal split of freight transport.

Figure 30: Traffic impacts of the STFM measure



Source: Elaborations on MIT-STFM Report, years 2018-2020. (*) 2021-2021 projection.

Based on the reports up to 2020 by RAM (Mediterranean Highways Network) S.p.A.¹⁴⁷, which were prepared on an annual basis for the Italian Ministry of Infrastructure and Transport, and assuming a projection of traffic levels for the years 2021-2022¹⁴⁸, the effect attributed to the regulation, from its entry into force and with the exception of the first year that was under a transitional regime, it can be estimated **a decrease of heavy road traffic varying between 1% and 2%**¹⁴⁹ annually on similar routes.

This led to a measurable reduction in climate-changing emissions, **between 150,000 and 200,000 tonnes of CO₂eq avoided per year** (Figure 31), calculated using the unit rail-road differential of the average emission factors per tonne-kilometre, reported in the latest Global Logistics Emissions Council Framework (GLEC)¹⁵⁰, and assuming that the greater rail traffic depends mainly on trucks and articulated vehicles diverted from road traffic¹⁵¹, with a goods train energy mix of more than 98% electric traction and

¹⁴⁷ RAM - Logistica Infrastrutture Trasporti S.p.A. is an in-house company of the Italian Ministry of Infrastructure and Transport, with capital wholly owned by the Italian Ministry of Economy and Finance. It was established in 2004 under the name RAM (Mediterranean Highways Network), with the aim of implementing the so-called 'National Programme of the Motorways of the Sea' within the broader context of the Trans-European Transport Network (TEN-T). Today, RAM promotes and technically supports the preparation, implementation and management of the lines of intervention on transport and logistics and, more in general, on logistics, infrastructures and transport issues, as foreseen in the planning and programming documents of the Ministry as well as in coherence with the European programming documents.

¹⁴⁸ The figure for 2022 was estimated assuming an increase in freight traffic of +4%, in line with the most recent Business Plan of the National Rail Infrastructure Manager.

¹⁴⁹ Source: RAM elaborations on CNIT data.

¹⁵⁰ The Global Logistics Emissions Council Framework (GLEC) shows an emission differential, as of 2019, between rail (with the 98/2 electric/diesel mix) and heavy road traffic (HGVs over 20 tonnes) of 92-10 = 82 grams of CO₂ equivalent per tonne.km. See Global Logistics Emissions Council Framework 2021 - GLEC Framework ed. Feb. 2021.

¹⁵¹ In particular, it is assumed that rail is an alternative to road traffic of environmentally friendly diesel trucks and articulated lorries with a mass of more than 20 tonnes, used on medium and long-distance non-urban routes. The most representative vehicle fleet in the area concerned (Abruzzo, Molise, Lazio, Campania, Apulia, Basilicata, Calabria, Sardinia and Sicily) is in fact characterised by the overwhelming majority of heavy goods vehicles of the diesel type with a low environmental class. See statistics in Automobile in Figures and the ANFIA Statistical Yearbook, edition 2022.

the remaining diesel¹⁵² and incorporating the forecasts of progressive reduction of the emission capacity of transports linked to the 'Net Zero' strategy¹⁵³.

Figure 31: STFM measure – Impacts on the greenhouse effect in terms of CO₂eq avoided



Source: Elaborations on MIT-STFM Report, years 2018-2020. (*) 2021-2021 projection.

Positive impacts can also be estimated in terms of air quality, due to less heavy vehicle traffic on the road and the related lower production of air pollutants from road vehicle combustion processes: in particular, nitrogen oxides (NO_x), sulphur dioxide (SO₂), non-methane volatile organic compounds (NMVOCs) and particulate matter (PM_{2.5}). The value of avoided emissions is obtained by multiplying the average emissions¹⁵⁴ by the annual changes, estimated to be decreasing, in vehicle-kilometres and tonne-kilometres on the road, net of the pollution produced by increased rail transport¹⁵⁵.

It follows that the entire rail cargo sector ensured **lower emissions of nitrogen oxides amounting to almost 8,000 tonnes per year** and of **non-methane volatile organic compounds amounting to approximately 200 tonnes per year**, of which almost **10% can be directly attributed to the STFM measure**¹⁵⁶ (Figure 32).

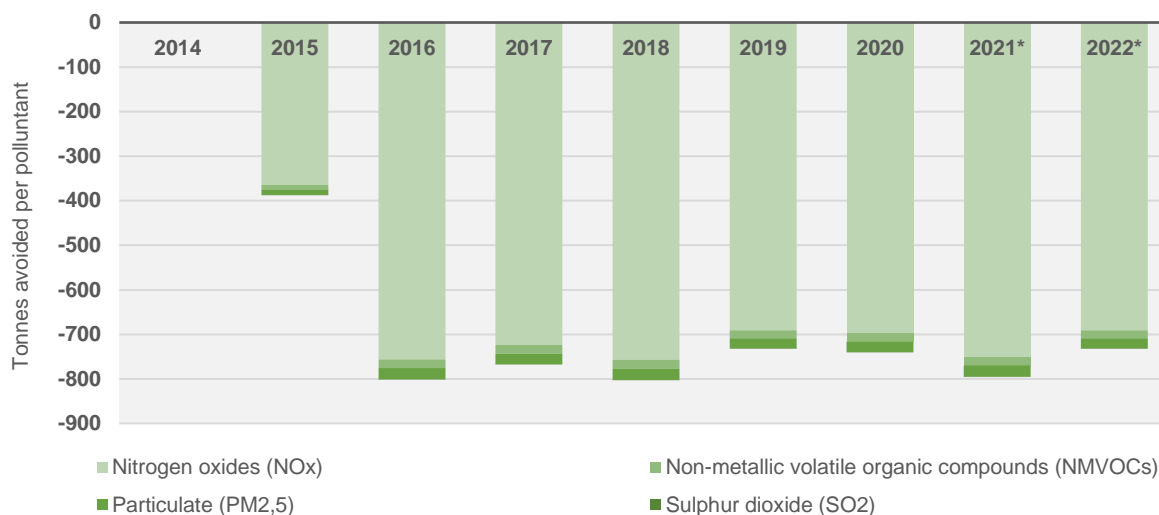
¹⁵² Data by the National Railway Infrastructure Manager (RFI).

¹⁵³ For the purposes of the analysis, the differential is estimated to decrease over time to include the progressive reduction of emission factors on both road and rail, due to the implementation of Community and national policies for mitigating climate change, which will result in lower average unit emissions of both road vehicles (due to the progressive entry into service of increasingly less polluting vehicles and the relative ageing of the vehicle fleet) and circulating trains (due to the progressive elimination of diesel trains, improved energy consumption and greater energy production from less polluting sources). Consider, for the road mode, the strategies outlined in the European context (COM/2014/0285 final 'Strategy for reducing Heavy-Duty Vehicles fuel consumption and CO₂ emissions') regarding heavy vehicle emissions. For the rail mode, consider the projections to 2050 drawn up by the Italian government in the framework of the Paris Agreement, negotiated at COP21 in 2015. In particular, the document 'Italian long-term strategy on the reduction of greenhouse gas emissions' forecasts a reduction of 3.5% per year in climate-changing emissions (Mt) for the production of electricity, based on a reference scenario characterised by a gradual adjustment of the mix of energy sources for energy production in favour of renewables. This estimate is consistent with the trend of greenhouse gas reductions per kWh of electricity which occurred in the period 2005-2021 (source: ISPRA).

¹⁵⁴ Reference was made to the average emission factors for road transport, taken from the Copert model and provided by ISPRA on the basis of the 'EMEP/EEA air pollutant emission inventory guidebook 2019' in line with the 2006 IPCC Guidelines and taking into account the characteristics of the vehicle fleet in the most affected regions, that is the ones located in the south of Italy and islands.

¹⁵⁵ The calculation is based on the emissions identified in the National Account for the rail mode, isolating only the freight component considering the distribution of energy consumption (83% passengers vs. 17% freight in 2019, data from the National Railway Infrastructure Manager - PIC-RFI database).

¹⁵⁶ Source: Italian Ministry of Infrastructure and Transport, 2020 Report on the Rail Freight Support Measure (STFM).

Figure 32: STFM measure – Direct impacts on air pollution in terms of tonnes avoided by type of pollutant

Source: Elaborations on MIT-STFM Report, years 2018-2020. (*) 2021-2021 projection.

Finally, a study carried out by the European Commission¹⁵⁷, concerning the external cost differential of rail and road per tonne-kilometre, monetised the savings for society due to less road traffic as a result of the contribution to rail cargo including not only the reduction in greenhouse gases and air pollution, but also the reduction in noise pollution, accidents and congestion costs.

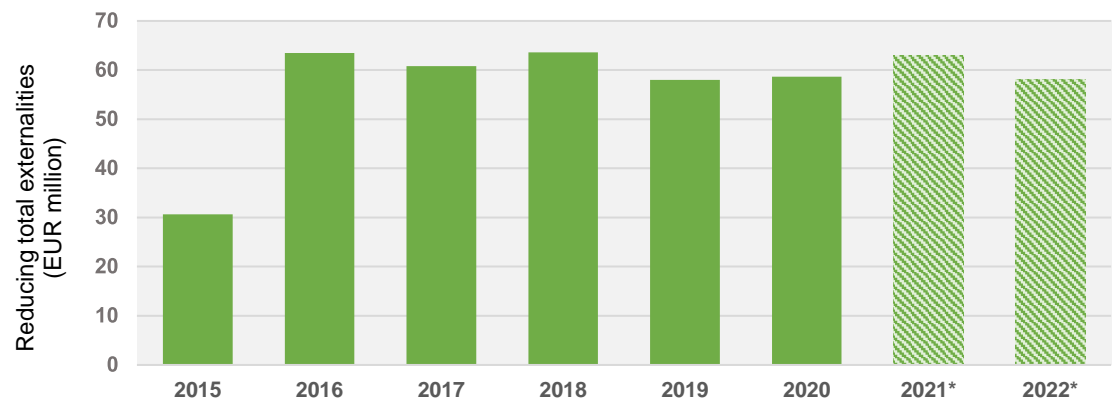
Based on the analyses developed in the Ministry's report up to 2020, with subsequent projections for the years 2021-2022, it was calculated that the contribution saved almost **EUR 60 million per year** (Figure 33), estimated using **a differential between rail and road of 3.1 €/tonne.km**. Almost 37% of this value can be attributed to **environmental impacts** (climate-changing gas emissions, air pollution and noise), and the remaining part to **social impacts** (e.g., lower accident rates on rail compared to road¹⁵⁸ and congestion costs¹⁵⁹ linked to road alone).

¹⁵⁷ Handbook of external costs in transport, Version January 2019 - 1.1, developed in the study "Sustainable Transport Infrastructure Charging and Internalisation of Transport Externalities" by DG MOVE of the European Commission.

¹⁵⁸ The European Commission's Handbook of external costs in transport shows that, in EU28, the average external costs of accidents are 6 Euro cent per tonne.km for road transport of Light Commercial Vehicle (LCV), 1.3 Euro cent per tonne.km for road transport of Heavy Goods Vehicle (HGV) and only 0.1 Euro cent per tonne.km for goods trains. These values take into account the different annual accident rates detectable from official statistics for road and rail modes. In Italy, in the case of road transport, accident, mortality and injury rates can be deduced from the data contained in Half-Yearly Reports by AISCAT (Italian Association of Toll Motorways and Tunnels Operators), referring to motorway traffic, distinguishing between light and heavy vehicles; while, for the rail mode, the number of accidents can be deduced from the ISTAT database, in compliance with the provisions of the Regulation of the European Parliament and of the Council No. 91/2003 and subsequent amendments and integrations.

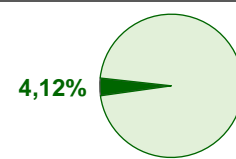
¹⁵⁹ A congestion cost occurs when an additional vehicle reduces the speed of other vehicles in the flow and thus increases their travel time. The cost of road congestion is defined on the basis of a speed-flow relationship in a given context, e.g., in an urban or interurban level, considering the cost of delay and deadweight. The Handbook of external costs in transport of the European Commission shows that, in the EU28, the average external costs related to road congestion of goods vehicles, considering both urban and interurban contexts, are 11.63 Euro cent per tonne.km for LCV road transport, 1.3 Euro cent per tonne.km for HGV road transport, while they are absent for rail traffic. On the basis of these data, the Handbook also estimates the marginal social cost of congestion, which in the case of HGV is estimated at between 0 and 6.8 Euro cent per tonne.km in the interurban area, depending on whether motorways or other roads are underused or highly congested. The same ranges from 0 to 100.5 in the case of LCV.

Figure 33: STFM measure – monetisation of minor externalities (EUR million)










Source: Elaborations on MIT-STFM Report, years 2018-2020. (*) 2021-2021 projection.

12.2 Interventions for local public transport: subways



% 2019-2022 allocated resources

UN Sustainable Development Goals					EU environmental objectives		CATEGORY 3		
							Transport		
Subcategories of eligible expenditure					2019	2020	2021	2022	Total
Subways					4,648	26,205	58,968	244,287	334,109

(values expressed in EUR thousand)

With a total turnover of more than EUR 12 billion per year, more than 900 active companies, around 114.000 employees and **5.5 billion passengers transported each year** (of which 82.3% by bus, tram, subway and other urban transport; 14.7% by regional trains and 3% by shipping)¹⁶⁰, the **local public transport (LPT) sector** is of particular importance for its environmental, as well as its economic and social impacts.

With regards to environmental aspects, this sector can make a **significant contribution to reducing the external costs of transport**.

As a matter of fact, regardless if it is by road¹⁶¹ or by rail, **public transport is more sustainable than its alternatives**, with lower emissions of climate-changing gases (particularly CO₂, which accounts for 98.8% of climate-changing emissions) and pollutants with local scale effects (fine dust, nitrogen oxides, organic compounds). It is worth noting that total rail transport, including urban transport, **contributed just 0.1% of total transport GHG production in 2019**, down by -78% since 1990.

In an attempt to further develop the sector, with the issue of 2022 **BTP Green**, a contribution was made to the financing of interventions for the **construction of suburban subway and railway networks**, including the M1, M3, M4 and M5 lines in Milan, the Line 1 of Naples (Centro Direzionale-Capodichino section), the Turin subway (Line 1), Line C of Rome, the Brescia subway-bus automated light subway, the Circumetnea railway (Catania subway), as well as the modernisation of other lines.

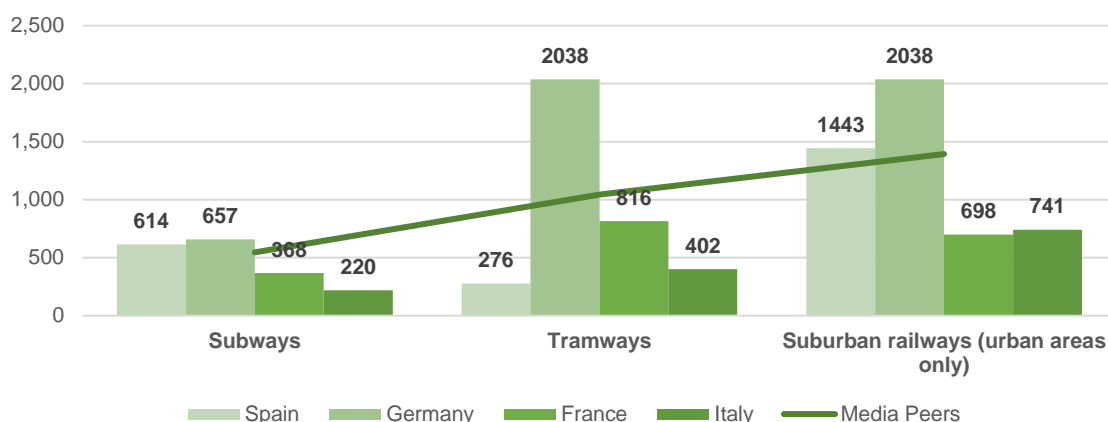
The numbers of Italian local public transport, which is a crucial sector for a country's development and sustainability in environmental terms, reveal the need for major investments to reach European standards and fill the structural gap¹⁶². As a matter of fact, Italian cities have less than half as many subway and tram lines and just over half as many suburban railway lines as the average of the main European peers (Figure 34).

¹⁶⁰ ISFORT, CNEL, 19th Report on the Mobility of Italians, 12 December 2022.

¹⁶¹ According to ISPRA data, in 2019 buses contributed to just 3% of greenhouse gas emissions from road traffic, compared to 69% for passenger cars and 25% for light and heavy commercial vehicles. Moreover, the contribution to GHG emissions from buses is decreasing compared to the 2019, and this is mainly due to the progressive modernisation of fleets.

¹⁶² Germany shows - in absolute values - the highest quantity of tracks for cities and suburban areas: 653 km for subways (just below the UK's 673 km), more than 2,000 km for tramways (more than twice as many as France, four times as many as Italy) and more than 2,000 km of suburban railways (followed by the UK with almost 1,700 km Italy has only 741 km).

Figure 34: National urban and suburban railway infrastructure compared to European Peers
(network kilometres)



Source: Elaboration on 2020-2021 National Account of Infrastructure and Sustainable Mobility and 2022 Pendolaria Report.

In total, there are about **220 kilometres of subway network in the seven Italian cities** where it is present (i.e., Milan, Rome, Turin, Naples, Genoa, Brescia and Catania)¹⁶³, while the **tram network reaches an extension of about 402 km**¹⁶⁴. In per capita terms: Rome has 1.4 km of subway networks per 100,000 inhabitants, Naples 1.5 km and Milan 3 km, compared to 4.5 km in Madrid and 4.3 km in Berlin, while Barcelona stands at 3.2 km and Paris at 1.8 km.

Therefore, there is a clear need to **increase supply capacity** and speed up travel times by public transport¹⁶⁵, also in order to increase average user satisfaction, since **in Italy demand is quite low** if compared to its international peers¹⁶⁶.

A higher and better quality of the urban rail transport mode offer could favour a modal shift from road transport, with positive environmental impacts – both in terms of reduction of greenhouse gas emissions and of air and noise pollution – and significant social impacts, related to lower accident rates and congestion. Consider that, in the year 2021, inland urban collective passenger transport¹⁶⁷ recorded **15,045 million passenger-km**¹⁶⁸ (just 2% of total inland traffic), of which almost **one third was covered by subway networks** (Figure 35).

The road mode is still clearly the most used mode in Italy for both public and private internal passenger traffic, and accounts for about 95% of the traffic detected, with a predominance of private over public transport (the private share is still about 80%).

In this sense, the **additional availability of capital injected into the local public transport sector** through the issue of green government bonds – equal to **EUR 334 million** with regards to the **2035 BTP Green** (issued in 2022), in addition to the **EUR 829 million** of the **2045 BTP Green** (issued in 2021).

¹⁶³ Stable figure from 2018 to date.

¹⁶⁴ Data from the National Census of Sustainable Infrastructure and Mobility 2019-2020. Source: Pendolaria Report 2022.

¹⁶⁵ Highest number of hours per inhabitant lost in travel.

¹⁶⁶ According to a survey on the perceived quality of LPT conducted by the European Commission in 2019 on a sample of around 80 cities in the Union, Italy has lower levels of satisfaction than the other main economies in the area. The aspects considered in the survey are: frequency of rides; timeliness; seats; ride speed; comfort of stops; cleanliness of vehicles; connection between municipalities; convenience of timetables; ticket cost. See Bank of Italy, Eurosystem, Questioni di Economia e Finanza (Occasional Papers) 'Il trasporto pubblico locale: passato, presente e futuro' by Sauro Mocetti and Giacomo Roma, Issue 615, April 2021.

¹⁶⁷ It includes transport on buses, urban tramways, subways, funiculars and cable cars.

¹⁶⁸ The data to 2021 are 24% lower than in 2019, due to the COVID-19 pandemic and remote work, but it is recovering with is compared to 2020.

Therefore, this represents an opportunity to strengthen and adapt the country's infrastructure availability in this sector.

Figure 35: 2019-2021 passenger traffic on urban public transport
Million passenger-kilometres









Source: Elaboration on 2020-2021 National Account of Infrastructure and Sustainable Mobility and 2022 Pendolaria Report.

12.3 Expenditures and contributions for railway infrastructure and HS / HC lines

26.88%

% 2019-2022 allocated resources

UN Sustainable Development Goals				EU environmental objectives		CATEGORY 3
						Transport
Subcategories of eligible expenditure		2019	2020	2021	2022	Total
<i>Expenditures and contributions for railway infrastructure and HS / HC lines</i>		1,053,385	-	156,445	968,787	2,178,617

(values expressed in EUR thousand)

The European Commission has repeatedly emphasised the need to strengthen rail services, including long-distance and cross-border services, in order to increase rail capacity, in view of the lower environmental impact of this transport mode compared to alternative modes, with the aim of achieving the European strategic goals of **doubling high-speed rail traffic by 2030 and tripling it by 2050**.

Within this framework are the investments for the strengthening and modernisation of the national railway infrastructure and for the growth of HS/HC services financed with the proceeds collected from the issues of green government bonds and to which important impacts at both the economic-social and environmental levels are linked. Italy has increasingly sought to **integrate even more the sustainability in the development of railway infrastructure projects** (from the design to the management of the completed works) in order to generate value for the territories, from an economic, social, cultural and touristic point of view, while being respectful of the environmental and landscape context of reference.

In addition to **reducing average journey times**, with positive effects on the national economy and the social system, investments in high-speed trains generate **important environmental benefits** - thanks to the development of an efficient, safe and environmentally friendly mobility - with substitution effects in the composition of traffic demand.

The Investments on the rail network and railway services bring benefits related to several objectives of the EU Taxonomy, due to the lower externalities associated with rail transport. New or upgraded infrastructures make it possible to reduce CO₂ emissions and improve air quality, due to the modal shift of a portion of traffic demand from other modes of transport (such as road and air, which are much more polluting).

Although a gradual reduction in emissions from car engines can be expected, thanks to the renewal of the car fleet and the spread of the latest generation of Euro 6 vehicles and electric vehicles, **significant environmental effects cannot be obtained without a reduction in the number of kilometres travelled by car**, also to the benefit of more sustainable modes of transport, both in the fight against climate change and in improving air quality.

The analysis of environmental issues goes hand in hand with the main railway projects carried out in Italy - from the earliest design stages on - and makes it possible to identify solutions to **safeguard natural resources** and **reduce the carbon footprint** of the projects, **minimise land consumption**, ensure the **protection of biodiversity**, facilitate **circular economy** processes and the reduction of waste production as well as guaranteeing a sustainable management of the construction phase.

Sites are studied and evaluations of the infrastructure's interferences on the ecological balances, the continuity of the ecosystems and the possible alterations of protected elements of the natural system¹⁶⁹ are made in order to carry out the works in the most **environmentally- and landscape-friendly** manner possible, so as to give back the natural surface subtracted, in line with the 'European Biodiversity Strategy'¹⁷⁰. The environmental design also provides for the identification of the significant environmental aspects related to the work site, as well as the mitigation measures and environmental monitoring activities necessary to ensure proper environmental control of the work site even during the construction phase¹⁷¹, promoting a **sustainable construction site model** involving all the companies working in the realisation of the project¹⁷².

Due to the peculiarities of the reference territorial context, the companies involved in the realisation of the railway investment are also obliged to provide objective evidence of the environmental control carried out, also in light of any changes resulting from the works¹⁷³.

This being said, below are some insights into two projects financed also through the proceeds raised in 2022 with the **2035 BTP Green**, obtained on the basis of information made available by RFI.

- Construction of the **new Salerno-Reggio Calabria HS/HC railway line**, which will also generate significant environmental benefits¹⁷⁴. The project is part of an evolution process of the railway system's presence in southern Italy, which provides for the construction of new works along the Scandinavia-Mediterranean European corridor.
- Investment programme for **doubling the Palermo Node railway system**, aimed at favouring a modal split in transport in favour of the railway carrier, improving the transport offer for passengers in terms of quality and quantity.

High speed line in the South of Italy: new HS/HC Salerno-Reggio Calabria line (Battipaglia-Praia section)

The new Salerno-Reggio Calabria HS/HC railway line is a **strategic element for the entire Italian railway network**, allowing the continuation of the North-South HS/HC route and an important opportunity for the southern regions, with a view to filling the existing infrastructure gap. As a matter of fact, railway infrastructures represent a concrete opportunity to trigger virtuous dynamics aimed at bridging territorial imbalances between different areas in terms of integration, accessibility, socio-economic development as well as contributing to the achievement of the decarbonisation of the transport sector.

Specifically, the new HS/HC Salerno-Reggio Calabria line will allow an increase in performance for the movement of passengers and goods with clear benefits in terms of greater connectivity and territorial

¹⁶⁹ Specifically, in the case of absence of direct interference of the project with Natura 2000 sites (Habitats Directive 92/43/EEC), an assessment is carried out to exclude any indirect impacts of the intervention with the above-mentioned sites (screening in accordance with the 'National Guidelines for the Assessment of Impacts' (VInCA) - Habitats Directive 92/43/EEC art. 6). In the case of direct interferences of the project with Natura 2000 sites an 'Appropriate Impact Assessment' is instead carried out.

¹⁷⁰ <https://www.mase.gov.it/pagina/strategia-europea-la-biodiversita>.

¹⁷¹ In the project development phase, special attention is paid to the management of excavated materials, a particularly significant aspect for the construction of complex works such as railways.

¹⁷² In particular, according to the contractual terms of the Tender Agreements, a structured monitoring of sustainability issues shall be ensured by the construction companies, with particular reference to the preparation and implementation of an Environmental Management System pursuant to UNI EN ISO 14001. In addition, during the construction phase, a structured control shall be implemented to monitor the proper environmental management of the work site by the contractors, through periodic inspections and surveys.

¹⁷³ To this end, the companies involved in the realisation of the work are obliged to design and implement the environmental management system and the environmental monitoring project, which are useful control tools that can provide objective evidence of the environmental control carried out throughout the duration of the works and site activities.

¹⁷⁴ In December 2019, Ferrovie dello Stato Italiane S.p.A. drew up a summary balance sheet of the first 10 years of operation of the Turin-Milan-Rome-Naples-Salerno HS/HC railway, estimating the following environmental, social and economic benefits attributable to the investment: in 2018, passengers who chose the HS service for their journeys reduced CO₂ emissions by 2 million tonnes with an average energy saving of 5,700 MWh; also in 2018, each passenger gained an average of 60 minutes of travel time compared to the same round trip made in 2005; between 2008 and 2018, rail passengers for tourism or leisure purposes quadrupled and, although international tourists increased by 10%, international tourists on HS trains increased by 19%.

cohesion, improved quality of life and socio-economic development. The Battipaglia-Praia project is the first lot of the infrastructure (Figure 36).

Figure 36: HS/HC Salerno-Reggio Calabria line – first lot Battipaglia Praia



Source: Rete Ferroviaria Italiana (RFI) data.

Through the traffic study prepared for the project and the comparison of the project scenario¹⁷⁵ with the reference scenario (of no intervention), it was possible to **estimate the benefits of the implementation of the investment in** terms of:

- increased rail traffic;
- related decrease in road traffic (for both passenger and freight transport), air traffic for passenger transport and sea traffic for freight transport.

Table 9 shows the benefits in terms of net avoided emissions (expressed in tCO₂eq) related to: the reduction in emissions of climate-changing gases¹⁷⁶ and atmospheric pollutants (expressed in tCO₂eq) and attributable to the modal diversion that it is assumed will be generated in the transport scenario following the planned activation of the project; the increase in emissions (expressed in tCO₂eq) produced by an increased train circulation. Estimates indicate that **net avoided emissions amount to 33,022 tCO₂eq in 2030 and 40,908 tCO₂eq in 2035**.

Table 10 also shows the estimated benefits resulting from the realisation of the infrastructure, in terms of lower air pollutants.

Table 9: Net benefit of greenhouse gas emissions (t.CO₂eq)

Reference Year	Avoided emissions from road transport (t.CO ₂ eq)	Avoided emissions from aviation (t.CO ₂ eq)	Avoided emissions from shipping (t.CO ₂ eq)	Emissions from train transport (t.CO ₂ eq)	Net avoided emissions (t.CO ₂ eq)*
2026	3,472	419	-	-4,275	-384

¹⁷⁵ Scenario in which Lot 1, the Paola-Cosenza track-doubling and the speeding up of the Battipaglia-Potenza line are planned.

¹⁷⁶ The following main greenhouse gases were taken into account for the estimation of greenhouse gas emission reductions: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). For the assessment of air pollutants, only the contribution from the reduction of road traffic (i.e., cars, heavy goods vehicles and buses) was considered in relation to four main types of pollutants: Particulate Matter (PM_{2.5}), Nitrogen Oxides (NO_x), Non-Methane Volatile Organic Compounds (COVNM) and Sulphur Dioxide (SO₂).

2030	48,350	14,791	15,630	-45,749	33,022
2035	51,079	15,581	23,536	-49,288	40,908

Source: Elaborations on Rete Ferroviaria Italiana (RFI) data.

* The balance in terms of net avoided emissions is calculated as the difference between the avoided climate-altering emissions (generated by the reduction of road, air and ship transport) and the climate-altering emissions generated by the increase in train traffic. Positive values indicate a benefit in terms of avoided climate-altering gas emissions.

Table 10: Benefit in terms of air pollutants (tonnes/year)

Reference year 2026				
Pollutant gas	Car	Bus	Heavy Goods Vehicles	Total benefit
PM _{2,5}	- 0.3135	- 0.1604	0.0000	- 0.4739
NO _x	- 9.3371	- 4.3216	0.0000	- 13.6586
NMVOCS	- 2.2650	- 0.2409	0.0000	- 2.5060
SO ₂	- 0.0111	- 0.0026	0.0000	- 0.0138
Reference year 2030				
Pollutant gas	Car	Bus	Heavy Goods Vehicles	Total benefit
PM _{2,5}	- 1.7205	- 1.7205	- 7.5521	- 9.6459
NO _x	- 55.1918	- 9.8147	- 198.5071	- 263.5137
NMVOCS	- 12.1477	- 0.5514	- 11.1517	- 23.8508
SO ₂	- 0.0706	- 0.0068	- 0.1373	- 0.2146
Reference year 2035				
Pollutant gas	Car	Bus	Heavy Goods Vehicles	Total benefit
PM _{2,5}	- 1.6365	- 0.3335	- 6.9783	- 8.9483
NO _x	- 52.8748	- 8.4105	- 175.9605	- 237.2458
NMVOCS	- 10.1668	- 0.4787	- 10.0156	- 20.6611
SO ₂	- 0.0737	- 0.0070	- 0.1466	- 0.2273

Source: Elaborations on Rete Ferroviaria Italiana (RFI) data.

The attention to environmental and sustainability issues has led to the identification of design solutions characterised by **less interference with the natural** and built environment, promoting circular economy processes with particular reference to the use of **excavated materials** within construction sites or to redevelop degraded sites in the surrounding area.

In particular, the design choices have **reduced waste production** and encouraged the **sustainable management of waste materials** by promoting their reuse (both on the site and at degraded external sites) as by-products with percentages of over 92% for sub-lot 1a Battipaglia-Romagnano¹⁷⁷.

¹⁷⁷ With reference to the Battipaglia-Romagnano sub-lot, the construction of the works results in the overall production of 6,026,609 m³ (in blank) of excavated materials, of which 5,579,114 m³ (in blank) are to be managed as by-products pursuant to Presidential Decree

The location of the works and the construction system focused on **limiting as much as possible the interference with natural areas** and especially with protected natural areas (such as park areas and sites belonging to the Natura 2000 network)¹⁷⁸. In particular, the project provides for the **insertion of green works** designed to reintroduce autochthonous species with the aim of improving the ecological value of the area and to integrate the works harmoniously into the landscape¹⁷⁹.

Finally, with regards to the construction site areas, all areas not affected by future project works or landscaping interventions, whether agricultural or natural, are expected to be restored to their *ante operam* state.

In addition, a **specific sustainability analysis** was conducted¹⁸⁰, aimed at providing a clear reading on the potential of the project to generate value, with particular reference to the project's intrinsic capacity to contribute to - among other things - the achievement of European targets for reducing emissions and the progressive decarbonisation of mobility, with specific focuses on **habitats and natural areas** and the **management of waste materials**.

Finally, it should be noted that the projects related to the Romagnano-Buonabitacolo and Buonabitacolo-Praia sub-lots are currently under development. However, during the technical-economic feasibility project phase (PFTE), the **environmental characterisations carried out** showed the possibility of maximising the reuse as a by-product, pursuant to Presidential Decree 120/2017¹⁸¹, of the excavated soil and rocks produced¹⁸².

Palermo rail link

In Italy, the prevailing share of people's trips takes place within urban areas: in the year 2019, the percentage of trips that originated and ended within municipal boundaries out of the total number of trips is estimated to be 74%¹⁸³, while **75% of trips are less than 10 km long**. Data from the "Audimob" observatory of the ISFORT also show that the percentage of **car journeys covers more than 60% of the total**.

To this self-evident prevalence of the private car in the modal split of means of transport, the following considerations must be added: Italy has the highest number of cars per thousand inhabitants among the

120/2017, as specified below: overall production (m³ in blank) equal to 4,562,916; internal reuse (m³ in blank) amounting to 1,551,658; external supply (m³ in blank) amounting to 1,974,829; external reuse (m³ in blank) amounting to 4,027,456; surplus materials - waste (m³ in blank) amounting to 447,495.

¹⁷⁸ The technical-economic feasibility project (PFTE) for the new Salerno-Reggio Calabria HS/HC line (Battipaglia-Romagnano section) and interconnection with the existing Battipaglia-Potenza line obtained a positive opinion of environmental compatibility from the PNRR-PNIEC Technical Commission No. 13 of 20 June 2022, attached to Ministerial Decree 2022-0000165 of 2 August 2022, subject to compliance with the conditions for the subsequent design and mitigation phases. The same project obtained a favourable opinion on the absence of negative and significant impacts on Natura 2000 sites.

¹⁷⁹ The following criteria were used in choosing these green interventions; favouring autochthonous species suited to the pedo-climatic characteristics of the site; reconstituting biological corridors, interrupted by the cutting off of trees and shrubs, or forming new ones, by connecting the fragmented vegetation; recomposing the structure of the various interfered landscapes; redeveloping limited areas created by the new road layouts and having characteristics of size and/or layout such that they cannot be destined to the previous land use; renaturalising the bank sections of the water courses affected by the interventions; masking or mitigating the intrusiveness of the works of art in terms of visual perception; creating vegetation filters capable, once developed, of containing the dispersion of dust, gaseous pollutants, noise, etc.; increasing biodiversity.

¹⁸⁰ In line with the guidelines of the Ministry of Infrastructures and Transport (MIT) of July 2021 'Guidelines for designing a technical and economic feasibility project as a basis for awarding public works contracts of the NRRP and NCP.

¹⁸¹ In particular, the works necessary for the construction of the railway section are characterised by the following material flows: excavated materials to be reused within the scope of the contract, which will be transported from the production sites to the processing and storage sites awaiting use, which will be treated following normal industrial practice - where necessary - and finally delivered to the sites of use within the construction site; surplus excavated materials transported from the production sites to the storage sites awaiting use, and finally delivered to the sites of destination outside the worksite; surplus excavated materials that are not reused as by-products and therefore managed under the waste regime (in accordance with Part IV of Legislative Decree 152/06, as amended); materials necessary for the completion/realisation of the work that must be supplied externally.

¹⁸³ Source: ISFORT, "Audimob" Observatory on the Mobility of Italians - 2020 Report.

main European countries, and the figures are growing; the car fleet is among the oldest in Western Europe; 53% of cars had an energy class below Euro 5, while the share of electric and hybrid cars was less than 3% (2021 figures)¹⁸⁴.

In this scenario, **transport by vehicles in the metropolitan areas is of significant importance with regards to urban air pollution and congestion.**

The metropolitan area of Palermo is the largest in Sicily and is characterised by urban continuity and strong social and economic interaction. It is home to about 1 million inhabitants, of which about 60% live in the Municipality of Palermo alone. This area is also characterised by a low share of travel by public transport, which amount to about 8%¹⁸⁵.

In 2017, the motorisation rate of the Municipality of Palermo, expressed in terms of the number of cars on the road per 100 inhabitants, was 58.2%, with a percentage of cars with an energy class below Euro 5 of around 76%¹⁸⁶.

Looking at studies on the damage caused by air pollution produced by ISPRA, Palermo is one of the worst areas in southern Italy, with a monetary value of annual air pollution costs estimated at around EUR 500 million¹⁸⁷.

Legambiente's annual analysis of the state of atmospheric pollution in Italy's provincial capitals on fine particulate matter (PM₁₀ and PM_{2.5}) and nitrogen dioxide (NO₂) shows that **the main source of nitrogen oxide emissions is vehicle traffic**; the data show that if the limit set by the WHO (10 µg/m³) is taken into consideration, 91 of the cities analysed (corresponding to 97% of the total) would currently exceed this threshold. Palermo is among the 12 cities with the highest level of pollution due to NO₂¹⁸⁸.

Even in terms of congestion, the city of Palermo has significant problems. If we only take into account Europe, Palermo – with a traffic delay estimated at 121 hours per inhabitant per year – is the third city in terms of congestion, after London and Paris¹⁸⁹.

In order to reduce the use of private cars in favour of public transport services in the metropolitan area, **the doubling of the Palermo node** is envisaged.

The Investment Programme for doubling the railway system of the Palermo Node is aimed at favouring **a distribution of transport in favour of the railway carrier** and improving the offer of passenger transport in qualitative and quantitative terms. The interventions favour the integration of Palermo's railway infrastructure with the connecting routes to the west and east of the Sicily Region, as well as to the north of the country and with Europe by favouring the connection with the Punta Raisi airport, which is a strategic infrastructure for the socio-economic development of Southern Italy and the interconnection system of the national and European infrastructure networks. The reduction of car traffic towards alternative means of transport with low carbon emissions would imply, among other things: **the reduction of the congestion in the road structure, the diminution in CO₂, in the air pollutants and in sound pollution.**

By contributing to transforming the existing railway line into a “subway” of the Sicilian Region and bringing it up to European standards, the Programme is part of the broader project to upgrade the Scandinavian-Mediterranean Corridor, included in the TEN-T list¹⁹⁰.

¹⁸⁴ Source: Eurostat. Source: ISFORT, “Audimob” Observatory on the Mobility of Italians - 2020 Report.

¹⁸⁵ Modal share of public transport, Source: Legambiente - Pendolaria Report 2019.

¹⁸⁶ City of Palermo - Sustainable Urban Mobility Plan - Knowledge Framework - 2019.

¹⁸⁷ Development of sustainable mobility in Italy: an econometric analysis - December 2022.

¹⁸⁸ Instead, the data show that all cities comply with the current regulatory limit (40 µg/m³).

¹⁸⁹ Source: Global Traffic Index 2022, INRIX available to: <https://inrix.com/scorecard/#city-ranking-list>.

¹⁹⁰ <https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html>.

More specifically the doubling of the railway system of the Palermo node has been divided into three parts (Figure 37). Palermo Centrale/Brancaccio–Notarbartolo (section A); ii) Notarbartolo-La Malfa (section B) e iii) La Malfa–Carini (section C).

Thanks to the new interventions it will be possible to reach from Palermo Central the airport “Falcone – Borsellino” of Punta Raisi with a metropolitan suburban service, a double track electric line. The line will connect the numerous urban centres situated west of Palermo with the city. Trains coming from the east will be able to easily transit in the direction of Trapani and connect with the airport.

Figure 37: Doubling of the Palermo Node railway system



Source: Rete Ferroviaria Italiana (RFI) data.

The relative traffic study estimates a **reduction of private car use**, which represents the main objective of the investment, for the entire network and for the different components of traffic, equal to **around 25-26 million of cars-km/year for the urban/metropolitan area** and of about **3.7 million of cars-km/year million vehicle-km/year for the airport route**.

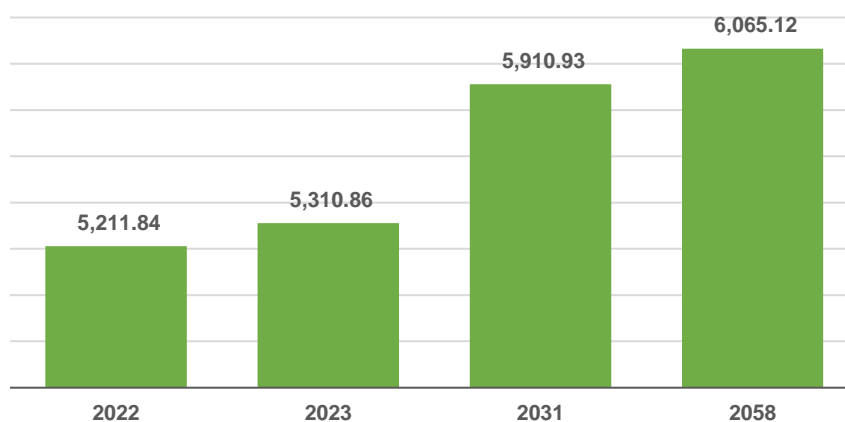
To the reduction of the car traffic is associated a decrease of emissions of CO₂ equal to 219,650.72 tons for the period 2022-2058 (Figure 38).

Also for the doubling of the railway system of the Palermo node the attention towards environmental and sustainability issues led to identify project solutions characterised by lower interferences with the natural and constructed habitat, promoting processes of circular economy with a particular reference to excavation materials within the construction sites or degraded sites with specific focuses related to the habitat and natural areas and to the management of excavation material.

With respect to the first focus, the project is located far away from protected natural areas of the Natura 2000 network and complies with the environmental checks contained in the present laws ¹⁹¹.

¹⁹¹ The project passed the Verification of Compliance and on 05 July 2017 the positive opinion number 99/17 of the technical specialized Commission for the environmental authorizations of regional competence was issued and transmitted by the Regional Agency for the environment protection (ARTA) with a note prot. 50991 of 11 July 2017.

Figure 38: Doubling of the Palermo Node railway system – avoided greenhouse gas emissions
CO₂ avoided emissions (tonnes); cars only.



Source: Elaboration on Rete Ferroviaria Italiana (RFI) data.

The approach followed for the management of the interventions for the entire network aims at a better use of the natural resources, reducing therefore the use of virgin cave materials, and to prevent the creation of waste. Specifically the realization of the works produces a total of 3,309,706 m³ (in blank) of excavation materials of which 2,813,476 m³ (in blank) of by products, with a percentage of reutilisation (internal and external) equal to 85% (Table 11)

Table 11: Waste material management

Routes	Total production (m ³)	Internal reuse (m ³)	External reuse (m ³)	Redundant materials - waste (m ³)
Routes A e C	2,325,000	697,500	1,272,727	354,773
Route B	984,706	47,215	796,034	141,457
Total	3,309,706	744,715	2,068,761	496,230

Source: Elaboration on Rete Ferroviaria Italiana (RFI) data.

13 Sustainable use and protection of water resources



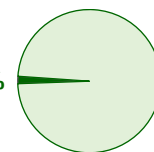
Water is an essential element for human, animal and plant life, as well as for the economy. The sustainable use and protection of water resources is therefore a necessary response to climate change and increasing levels of pollution, as also highlighted by the Sustainable Development Goals (SDGs) of the UN, as well as by the extensive European legislative activity¹⁹².

Although **Italy is characterised by a low level of water stress**¹⁹³, having a good supply of water both on the surface and in the subsoil, in the recent years there has been a continuous increase in the number of areas affected by extreme drought, which, together with the growing demand resulting from economic and urban development, are putting a severe strain on water infrastructures and on the availability of water¹⁹⁴.

In order to take on the challenges imposed by climate change, more investments in water infrastructure (from dams to reservoirs), adequate catchment networks, storage systems, transport and distribution networks, purification systems and water reuse systems shall be made.

13.1 Water infrastructure, water networks and integrated water systems

1.68%



% 2019-2022 allocated resources

UN Sustainable Development Goals					EU environmental objectives			CATEGORY 5
								Protection of the environment and biological diversity

Subcategories of eligible expenditure	2019	2020	2021	2022	Total
<i>Water infrastructure</i>	8,286	26,600	25,367	75,884	136,137

(values expressed in EUR thousand)

¹⁹² In 2012, the Commission presented the 'Blueprint to Safeguard Europe's Water Resources', a long-term strategy to ensure adequate water supply in terms of quality and quantity for all legitimate uses by improving the implementation of existing EU water policy. In 2000, Directive 2000/60/EC establishing a framework for Community action in the field of water policy, protection of inland surface waters, coastal waters and groundwater was also launched. It aims to prevent and reduce pollution, promote sustainable water use, protect and enhance the aquatic environment, and mitigate the effects of floods and droughts. The Water Framework Directive is complemented by more targeted directives, such as the Groundwater Directive (Directive 2006/118/EC), the Drinking Water Directive (Directive 2020/2184/EU), the Bathing Water Directive (Directive 2006/7/EC), the Nitrates Directive (Directive 91/676/EEC), the Urban Waste-Water Treatment Directive (Directive 91/271/EEC), the Environmental Quality Standards Directive (Directive 2008/105/EC) and the Floods Directive (Directive 2007/60/EC).

¹⁹³ Reference is made to the Water exploitation index, plus (WEI+), which is a measure, collected by Eurostat from information provided by the EEA, aimed at quantifying the state of pressure on renewable water resources. For values above the threshold of 20%, the EEA identifies a water scarcity condition, while water shortage is identified to be above 40%. The latest available data (2019) indicates that the Italian value is stationary at 7.8% with an EU average close to 3.6%.

¹⁹⁴ According to a study by Ambrosetti (2023), a water emergency condition, through shock transmission mechanisms in the supply chain, could put about 18% of the national gross domestic product at risk.

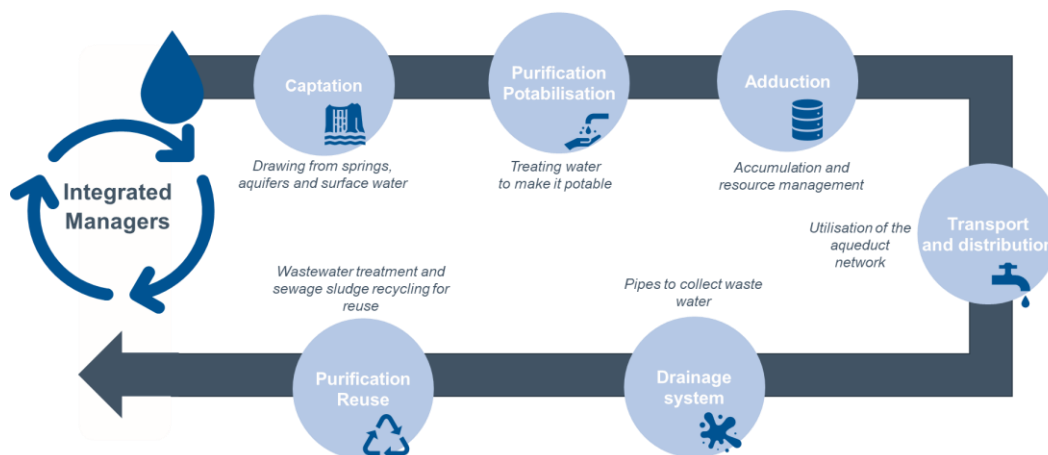
As reported in section 7, which deals with the **Protection of the environment and biological diversity**, the issue of the **2035 BTP Green** in 2022 financed a series of projects specifically aimed at enhancing water supply, to which resources amounting to **EUR 136 million** are allocated, for the 2019-2022 reporting period.

It should be noted that, with regards to the **2045 BTP Green** issued in two tranches in 2021, **EUR 388 million** had already been allocated for this type of expenditure, on separate projects but of the same nature, spread over the four-year period 2018-2021. Once again in the 2021 allocation, an additional **EUR 190 million** was also added to this sum for water purification works, mainly within the scope of integrated water systems. However, investments of the latter type have been included in the NRRP, which is financed with European resources; therefore, they are not included in this Report.

Despite the presence of the above-mentioned allocations in the state budget, the availability of additional financial resources is nonetheless necessary, as the water networks and the integrated water system (IWTS) suffer from inefficiencies, attributable to a volume of investment that is still inadequate both to complete the infrastructure network and to ensure the gradual modernisation of the plants that are already operational.

The infrastructure deficiencies in the sector are present at all the different levels of the supply chain (Figure 39). As far as the upstream phase is concerned, there are over 500 large dams¹⁹⁵ in the territory many of which have exceeded their useful life values (estimated at between 50 and 70 years from the time of construction)¹⁹⁶.

Figure 39: Stages in the water cycle for civil and multiple use



Source: Cassa Depositi e Prestiti analysis on Integrated Water Service (2022).

Despite their widespread distribution throughout the territory, only 70% of the available dams are fully operational, with a cumulative capacity of around 50% of the total reservoir capacity (around 7 billion m³ out of a total capacity of close to 14 billion m³), while the remainder is under-utilised or unused¹⁹⁷.

¹⁹⁵ Large dams (Law No. 84/1994) are defined as dam structures with a height of more than 15 m and/or a reservoir volume of more than 1,000,000 m³.

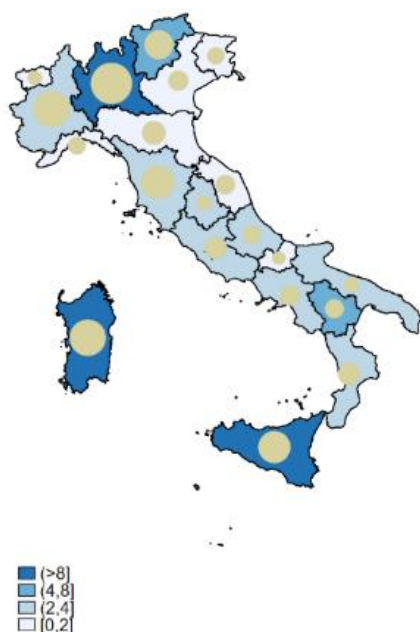
¹⁹⁶ Data from the "Registro Italiano Dighe" (Italian Dams Registry) (<https://dgdighe.mit.gov.it/>) show that around 30% of the dams were already present on Italian territory in 1940.

¹⁹⁷ Proger (2023), Water Economy in Italy.

In addition to these technical limitations, the overall storage capacity is also affected by the physiological process of silting¹⁹⁸: according to the estimates, silting ranges between 20% and 25% at international level, while in Italy it reaches about 30%¹⁹⁹.

Figure 40: Large dams on Italian territory

Spatial distribution* and reservoir capacity
2022, (% of total)



Storage capacity of water resources in large dams (m^3 billion and % of total)

Condition	No.	Reservoir capacity (m^3 billion)	% on reservoir capacity
Under construction	7	0.1	0.7
Under test	76	5.3	38.7
Restricted storage	41	1.2	8.8
Out of operation temporary	33	0.1	0.7
Normal operation	374	7.0	51.1
Total	531	13.7	100.0

* The size of the bubble is proportional to the regional number of dams.

Source: Proger.

On the other hand, when we consider smaller dams, the available data indicate the presence of more than 26,000 reservoirs²⁰⁰, the majority of which are located in Tuscany (i.e., more than 60%). Since they are quite old, they have suffered a strong weakening of their absorption capacity over time. It is necessary to pay particular attention to the critical issues concerning the average life of dams, also considering that they are mostly located in areas with a high or medium-high exposure to seismic events.

Even when it comes to the infrastructures used for the **transport and distribution** of water resources, there are problems related to their age: more than 35% of the aqueduct network is between 31 and 50 years old (22% is more than 50 years old), and this has inevitable repercussions on the quality of the service.

To assess its efficiency, one can consider water dispersion, given by the percentage ratio between the volume of total water losses²⁰¹ and the volume fed into the network: of the 8 billion cubic metres of drinking water fed into the network²⁰² **about 42% is subject to losses**. If compared to the national average, this

¹⁹⁸ That is, the deposition of solid material (soil, silt, sand, gravel) by flowing waters, when these lose their carrying capacity.

¹⁹⁹ This Italian result is strongly correlated with the average age of the dams (Proger, 2023).

²⁰⁰ ISPRA (2021).

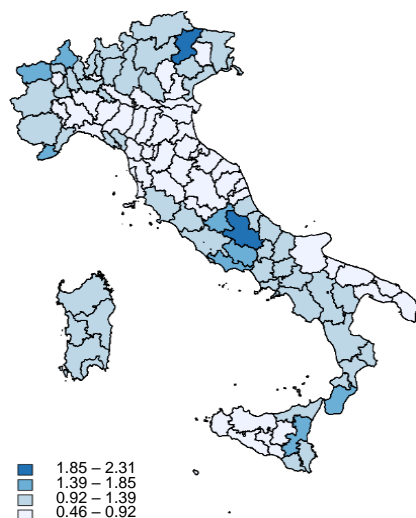
²⁰¹ Calculated as the difference between volumes fed into the grid and delivered and authorised volumes (Istat, 2023).

²⁰² Updated to 2020 (Istat, 2023).

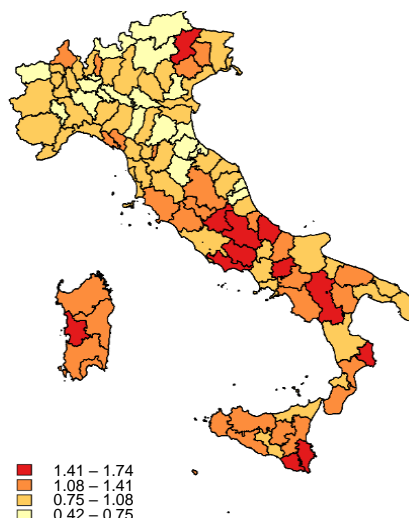
phenomenon tends to occur more in the Apennine and island catchment areas (Figure 41), that is the areas where the interventions financed with the proceeds collected through **BTP Green**, that are being reported, are mostly focused.

Figure 41: Drinking water inflow and total water loss
(2020), index number – Italian average = 1²⁰³

Water fed into the network (per capita)



Total water losses



Source: Elaboration on ISTAT data.

Similar criticalities are also evident **in the downstream phases of the water cycle**, which require an adjustment and strengthening of sewerage and purification pipelines and whose deficiencies have, in fact, been the subject of European infringement procedures, involving more than 900 agglomerations (of which about 73% are located in southern territories).

Despite the almost total national coverage of the sewerage service (approximately 99% of the resident population), there are approximately 7 million residents who are not connected to the network, but who use autonomous disposal systems²⁰⁴, and almost 390,000 of these reside in municipalities totally lacking the service (Table 12).

The lowest coverage is recorded in Sicily (with around 77% of the resident population), where – at provincial level (Figure 42) – Catania ranks first as the most critical place (with just 36% of the resident population).

Even if **urban waste-water purification plants** (i.e., more than 18,000 are operational)²⁰⁵ are taken into account, evident territorial gaps can be found: there are 296 municipalities characterised by the total absence of the service²⁰⁶, the majority of which belong to the southern territories (Sicily, Campania and Calabria predominantly), involving more than 1.3 million residents.

²⁰³ Values above (below) unity indicate a higher (lower) provincial incidence than the national average. More than half of the water losses are concentrated in 20 provinces that, with the exception of Belluno and La Spezia, are located in the Centre and in the South.

²⁰⁴ Source: Istat, 2022.

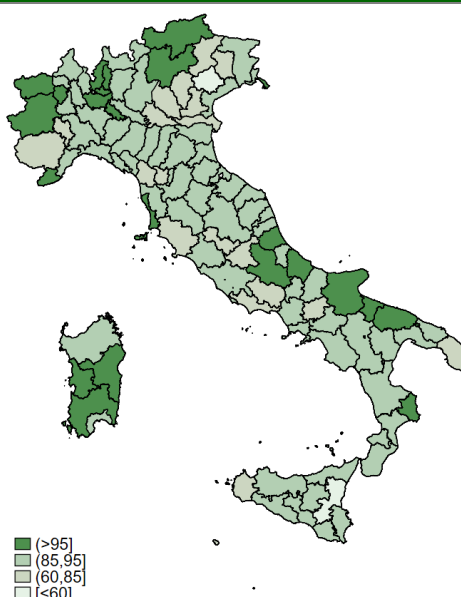
²⁰⁵ About 50% are located in Piedmont, Emilia-Romagna, Abruzzo and Lombardy.

²⁰⁶ Generally located in rural areas and with a fairly low population density. In this case, either private sewage disposal and treatment systems or connections to the public sewerage system are used, with discharges being channelled into surface/sea water courses via submarine pipelines (Istat, 2022).

Table 12: Structural deficiencies related to sewerage and purification services
 (2020 data)

Municipalities without sewerage service				Municipalities without a purification service		
Area	Number	Resident population	% of total population	Number	Resident population	% of total population
North-West	1	1,231	-	29	103,197	0.6
North-East	10	32,696	0.3	19	49,765	0.4
Centre	-	-	-	47	130,395	1.1
South	4	38,144	0.3	121	407,962	3.0
Islands	25	314,764	4.9	80	637,156	9.9
Italy	40	386,835	0.7	296	1,328,475	2.2

Fonte: ISTAT.

Figure 42: Coverage of public sewerage service
 (2020), % of the total resident population


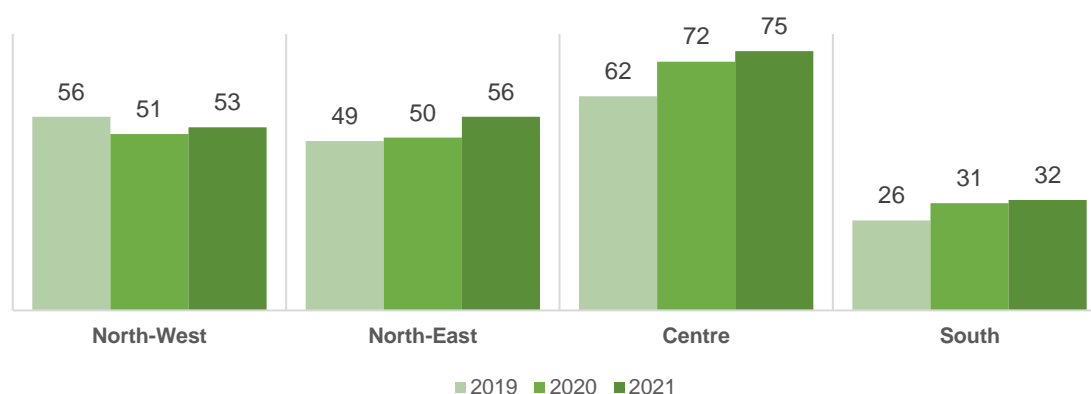
Source: Elaboration on ISTAT data.

Differences in the efficiency of the various services are also attributable to specific characteristics of the operators present in the integrated water systems. Approximately 76% of Italian municipalities (82% of the population) are characterised by the presence of integrated industrial companies (predominantly of low dimension), while the remaining share is either entrusted to economic management by municipal administrations (20% of municipalities and 14% of the population) or characterised by a fragmentation of the individual stages between operators.

These structural and governance factors, which are typical of the sector, have a direct impact on investment flows. In 2021, the resources mobilised by industrial operators reached a value close to EUR

56 per inhabitant (Figure 43) which, despite a growing dynamic²⁰⁷, is still far behind the European average (over EUR 80) and particularly lagging in the south.

Figure 43: Gross investment per capita – Industrial managers
(2019-2021), EUR per inhabitant



Source: Blue Book (2023).

The scenario described above clearly highlights the importance of increasing funding to ensure better levels of efficiency in the overall management of water resources, in light of the strong heterogeneity in their territorial availability and the varying level of technological adequacy of infrastructures. Filling these gaps is even more relevant in the presence of increasingly frequent extreme weather events, in order to improve ecosystem sustainability.

Therefore, **additional availability of capital, injected also through the issue of green government bonds, represents a real opportunity** not only to strengthen and adapt the availability of the infrastructure (and reduce the territorial gap), but also to encourage the identification and use of technological solutions capable of generating positive transversal effects in the water supply chain. Therefore, another important factor is the contribution of research bodies in this sector – among which ISPRA – which works in collaboration with universities and national and international bodies on these issues²⁰⁸, stands out.

²⁰⁷ Since 2012, when ARERA's independent regulation was initiated, investments have grown by around 70% (Blue Book, 2023).

²⁰⁸ The use of remote-control tools, for example, could facilitate a better management of the service even in extreme weather situations and ensure immediate action to contain the risk.

14 Pollution prevention and control and circular economy

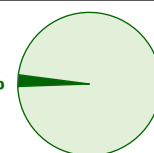


The current EU regulatory approach to the protection of environmental well-being and human health is set out in the “Towards Zero Pollution for Air, Water and Soil” action plan²⁰⁹.












The indications contained within this European framework also find confirmation in the initiatives financed through the **2035 BTP Green**. During the 2019-2022 four-year period, the allocation of resources has indeed been oriented towards a plurality of initiatives aimed at developing the circular economy and tackling pollution phenomena that, directly or indirectly, can cause damage to the ecosystem and human health.

14.1 Environmental recovery, integrated waste cycle and pollution control

2.70%



% 2019-2022 allocated resources

UN Sustainable Development Goals		EU environmental objectives					CATEGORY 4				
											Pollution prevention and control and circular economy
Subcategories of eligible expenditure		2019	2020	2021	2022	Total					
Plan for environmental recovery and integrated waste cycle		16,323	37,331	37,096	49,106	139,856					
Depollution and improvement of air quality		8,712	7,114	600	871	17,297					
Measures to combat marine and inland water pollution		2,524	2,480	2,063	54,491	61,559					

(values expressed in EUR thousand)

Integrated waste cycle

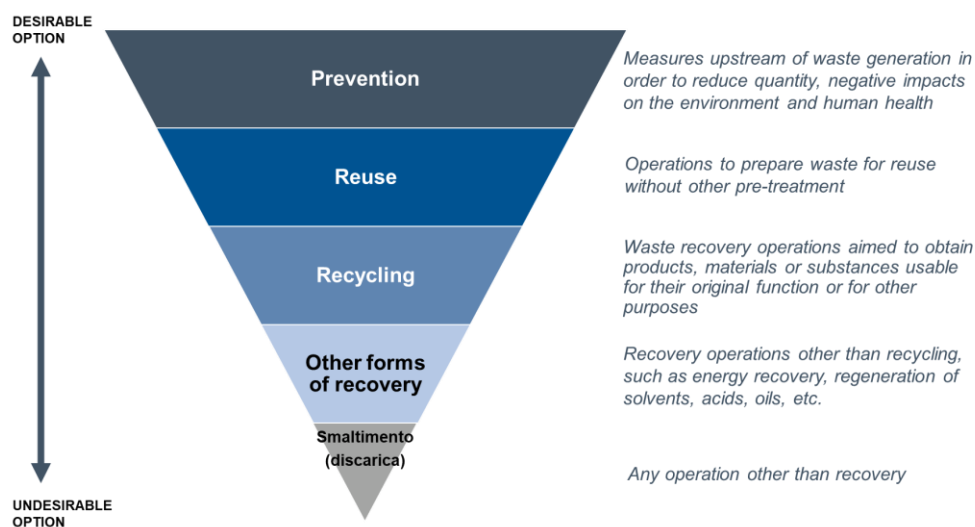
As reported in section 6, dedicated to **Pollution prevention and control and circular economy**, the proceeds raised from the issue of green government bonds financed important projects aimed at supporting the circular economy. In continuity with the previous allocation, the **2035 BTP Green**, issued in 2022, financed further projects in the 2019-2022 four-year period for more than **EUR 30 million** in favour of initiatives aimed at extending the life cycle of products and developing specific technologies to improve recycling and disposal processes²¹⁰.

²⁰⁹ Cfr. https://eur-lex.europa.eu/resource.html?uri=cellar:a1c34a56-b314-11eb-8aca-01aa75ed71a1.0013.02/DOC_1&format=PDF.

²¹⁰ As described in the section on revenue allocation, the resources were mainly allocated to: supervision and control activities in the field of integrated waste management; measures to reduce and prevent waste production and for the development of new recycling and disposal technologies; the “Mangiaplastica” experimental programme.

Circular economy has been at the heart of environmental policies for the last years²¹¹. Founded on the principle of recovering the value of goods and products at the end of their life, through reuse, regeneration and recycling, circularity has a significant effect on the sustainable use of resources and thus on the reduction of CO₂²¹² emissions, while also producing positive economic and employment benefits²¹³. Among the many benefits, one can highlight, for example, those generated by the reuse of waste in order to produce renewable energy (from biomass and waste otherwise destined for landfill), as well as those due to the recovery and recycling of technological products, which makes it possible to dispose of raw materials now considered critical due to the supply risk associated with them²¹⁴.

Figure 44: Circular economy and waste treatment hierarchy



Source: CDP.

To accelerate this transition, the European Union has recently launched several initiatives²¹⁵, targeting both **upstream processes** in the product lifecycle, through more efficient resource management (e.g., eco-design, energy labelling, etc.), and **downstream processes**, supporting the reduction of landfilling and a greater focus on the reuse of goods and the recycling of waste.

In the latter direction, the EU has set particularly challenging targets for member countries:

- achieve a recycling rate of between 65% for municipal waste and 70% for packaging by 2030²¹⁶;
- landfill a maximum of 10 per cent of urban waste produced (with a ban on sortable waste) by 2035²¹⁷.

²¹¹ See <https://www.mase.gov.it/pagina/economia-circolare>.

²¹² According to the European Commission, 26% of anthropogenic emissions come from the waste sector. A large part of these derive from landfill gas emissions even though, between 1990 and 2017, this percentage was significantly reduced thanks to the waste sorting of biodegradable waste.

²¹³ OECD (2023), 'The reuse revolution: how social enterprises are leading the way', which shows that 'reuse initiatives' can generate considerably more jobs than landfills and incinerators: on average 70 jobs are created for every 1,000 tonnes of materials collected for reuse. The number varies from 20 to 140 jobs depending on the type of materials processed. *Ellen Mac Arthur Foundation* (2015), 'Growth within: a circular economy vision for a competitive Europe' in which it is reported how the circular economy can increase the EU's GDP by 0.5 per cent and generate more than 700,000 new jobs by 2030.

²¹⁴ See *European Commission, Critical Raw Materials List* 2020.

²¹⁵ See the Circular Economy Action Plan, the Waste Framework Directive 2008/98/EC and its subsequent amendment in Directive 2018/851/EU.

²¹⁶ European Commission, Directive 2018/251 and Directive 2018/252. For municipal waste, the interim milestones are 55% for 2025 and 60% for 2030. For packaging waste, the targets are differentiated per material.

²¹⁷ European Commission, Directive 2018/250.

In this context, the **Italian waste system appears to be characterised by good results in terms of recycling of industrial waste (82%)²¹⁸ and packaging waste (73%)²¹⁹**, while some difficulties emerge with regard to the recycling rate of urban waste²²⁰ (48% at national level and 40% in central and southern Italy in 2021) which is although improving in recent years.

With regard to the management of the urban waste cycle, Italy is characterised by **significant territorial heterogeneity**, in part due to an uneven distribution of waste management plants throughout the country (657), with a greater presence of plants in the northern regions where about 60% of biological treatment plants (composting, integrated treatment and anaerobic digestion) and about 70% of energy recovery plants are concentrated (Table 13).

Table 13: Plants grouped by type and macro-area
2021 (abundance and %)

	Type of plant	Numerosity				% by territorial breakdown		
		North	Centre	South	Italy	North	Centre	South
Biological treatment	Composting	174	41	78	293	59%	14%	27%
	Integrated aerobic and anaerobic treatment	29	7	6	42	69%	17%	14%
	Anaerobic digestion	18	-	3	21	86%	-	14%
	Mechanical biological treatment (MBT)	41	34	49	124	33%	27%	40%
	Incineration	26	5	6	37	70%	14%	16%
	Co-incineration	8	1	5	14	57%	7%	36%
	Landfill site	53	28	45	126	42%	22%	36%
	Total	349	116	192	657	53%	18%	29%

Source: ISPRA.

The current insufficient equipment, particularly in the central and southern areas of the country, contributes to keeping the percentage of waste disposed in landfills high (19% in 2021) compared to the target set for 2035 (i.e., 10%)²²¹ with important territorial differences (Figure 45).

The use of landfills, in fact, besides being the least sustainable option, is also not feasible for a long time because many of the landfills in Italy are reaching their limits of use (an estimated national residual capacity of about 3 years, a value that drops to 2 years in the southern regions)²²².

Finally, the excessive use of landfills is also affected by the different forms of corporate management of the waste cycle in the local sphere. The governance process has been uneven at a local level, and in some areas of the country the sector is still characterised by the presence of a high number of operators²²³, generally active in the municipal sphere (horizontal dispersion) and in specific phases – upstream or downstream – of the chain (vertical dispersion). On the other hand, there are few and territorially concentrated big companies that manage the waste cycle entirely. Precisely, in areas where

²¹⁸ CDP (2023), "Waste and territorial disparities: what prospects for Italy?".

²¹⁹ CONAI, National Packaging Consortium, 2021.

²²⁰ For details on the waste classification, reference can be made to Legislative Decree 152/2006 and the subsequent Legislative Decree 116/2020 (Waste Decree), which transposed EU Directives 2018/851 and 2018/852 on waste and packaging and packaging waste, respectively.

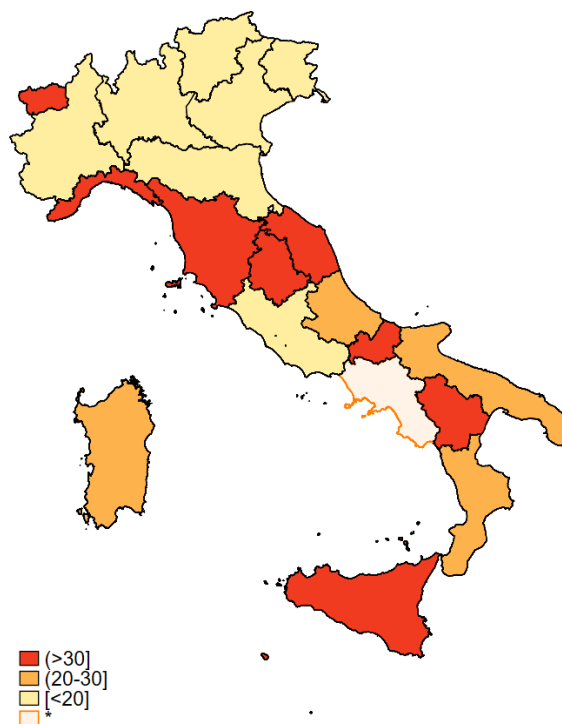
²²¹ ISPRA, 2021

²²² Utilitalia (2022), "Analysis of RU treatment needs in Italy as of today and as of 2035".

²²³ According to the data contained in the Green Book (2022), about 7,000 managers (including local authorities and companies) are active, of which 70% provide only one service, while the integrated cycle is carried out by about 2% of the subjects. Most of the companies specialise in the collection and transport phases and only a fraction in plant management (*capital intensive*); the remainder is represented by companies active both in collection and in the direct management of one or more waste recovery and/or disposal plants.

this integration is present with a relatively efficient plant equipment, landfill use is lower than in situations where operators are fragmented (usually in southern regions).

Figure 45: Landfilling of urban waste at regional level
2021 (% of waste to landfill on total regional urban waste)



* Two plants were closed in 2021.
Source: Elaboration on ISPRA data.

The achievement of European objectives in the area of urban waste cycle management, given the good performance recorded for the recycling of industrial and packaging waste (in line with European legislation), requires the adoption of targeted initiatives already identified in national sector policy documents²²⁴, including: improving the efficiency of the supply chain; balancing plant availability across the country; encouraging the development of energy recovery processes (in particular through anaerobic digestion); supporting innovation, maximising material recovery and efficiency in waste treatment and processing.

In order to contribute to Italy's complete transition to a sustainable and circular economy, the share of proceeds collected in 2022 from **BTP Green** issues allocated to the sector has increased compared to what was allocated in the past allocation. It should also be noted that, given the multi-level *governance* of the sector²²⁵, state competences and resources are flanked by regional competences and resources.

²²⁴ The National Strategy for the Circular Economy, the National Waste Prevention Programme and the National Waste Management Programme set the agenda to facilitate Italy's ecological transition.

²²⁵ Pursuant to Article 198-bis, paragraph 2, of Legislative Decree No. 152/2006, the National Waste Management Programme sets the macro-objectives, defines the criteria and strategic guidelines to be followed by the Regions and Autonomous Provinces in drawing up the Regional Waste Management Plans.

Environmental restoration and combating soil and air pollution

The proceeds collected from **BTP Green** issues during 2022, as documented in section 6, financed the study, monitoring, and inspection and control activities for environmental protection for an amount of resources allocated – over the 2019-2022 period – of about **EUR 15 million**²²⁶. These initiatives are flanked by specific funding for **environmental restoration, remediation and soil safety** measures for a total of approximately **EUR 109 million**²²⁷ and measures to **improve air pollution levels** for a further **EUR 2 million**²²⁸.

With specific reference to **soil protection**, EU initiatives²²⁹ are aimed at strengthening the analysis, assessment and remediation of contaminated sites with the goal of minimising the risk (to health or the environment) from soil pollution by 2050.

In the EU territory, the presence of almost 3 million potentially contaminated sites has been estimated, of which about 13% may require remediation²³⁰. At a national level, with a view to **combating soil pollution**, it appears particularly important to focus on both areas identified as contaminated²³¹ and those defined as Sites of National Interest (SIN)²³².

In 2021, about **34 thousand sites affected by a remediation process** were surveyed²³³ (on average one regional remediation process for every 9 km²) of which about 16 thousand (47% of the total) with a process not yet concluded. Focusing on the latter type of procedure²³⁴, about 62% of the sites (just over 10 thousand observations) are characterised by a **contamination status** (potential, 33%²³⁵ or verified, 29%²³⁶), while the rest is undergoing the assessment procedure²³⁷.

With reference to SIN (Figure 46), as of 2021 there are 42²³⁸ with a total surface area that represents about 0.5% of the surface area of the Italian territory²³⁹. However, the areas where there is prevalent asbestos contamination represent about 40% of the total surface area of SIN. 66% of the land area of the SIN has been declared contaminated, remediation/security measures have been approved for 14% of the surface area, and proceedings have been concluded in 16% of the surface area²⁴⁰.

²²⁶ In this respect, consider monitoring and control activities of industrial plants with a major accident risk; expenditure on activities, studies and inspections for the purpose of issuing integrated environmental authorisation.

²²⁷ In this regard, consider the remediation of public buildings contaminated with asbestos; the securing and remediation of areas included in sites of national interest; and the remediation of orphan sites.

²²⁸ In this regard, consider the expenses for technical and scientific support activities carried out by ISPRA in connection with the implementation of the REACH Regulation.

²²⁹ See Note 212.

²³⁰ JRC (2018), Status of local soil contamination in Europe.

²³¹ The site is declared contaminated if the Contamination Threshold Concentrations defined by Legislative Decree 152/06 and subsequent amendments and additions are exceeded. Part Four, Title V. For the management of contaminated sites, operational safety, permanent safety and remediation interventions are specified by law.

²³² Areas where the quantity and hazardousness of pollutants is concentrated to such an extent as to make the impact particularly risky in terms of health and ecological risk; these are generally areas characterised by the presence (current or past) of refineries, chemical plants or steelworks or by the presence of asbestos production and mining activities.

²³³ Reference is made to ISPRA & SNA (2021), 'The state of contaminated site remediation in Italy: regional data'. For details of the assessment processes see paragraph 2 "Data collection and methodology".

²³⁴ The coverage of this information is close to 97% of unfinished proceedings.

²³⁵ Where the contamination threshold concentrations (CSCs) were exceeded. ISPRA (2021) points out that [...] *the regulation defines the state of potential contamination, it refers to proceedings for which the level of knowledge of the environmental state is extremely heterogeneous, from preliminary in the case of activating proceedings to exhaustive in the case of concluded characterisations [...]*

²³⁶ Where environmental impact has been ascertained and where contamination exceeds the 'acceptability levels' that can be set equal to the CSCs or the risk threshold concentration (CSRs).

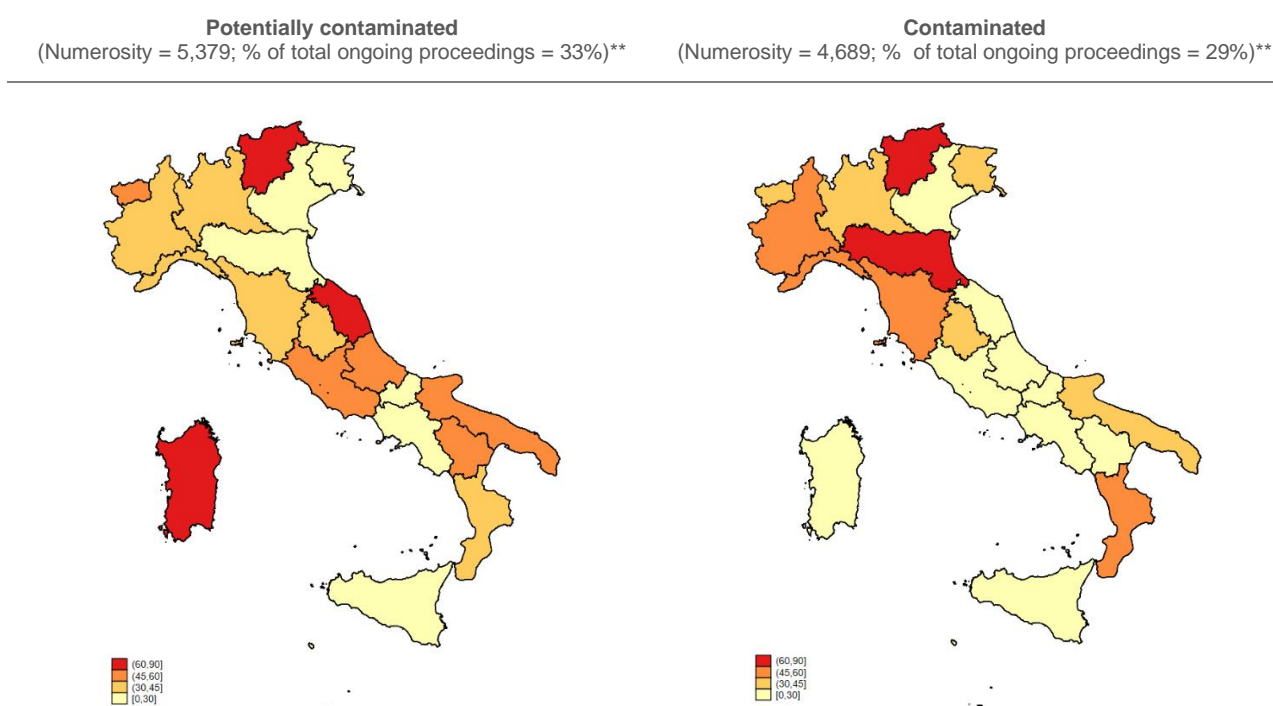
²³⁷ Reference is made to those sites where specific investigations and assessments are in progress, at the end of which the actual presence or absence of contamination can be ascertained and thus make possible the start of remediation or safety measures.

²³⁸ ISPRA (2023), "Atlas of Environmental Data".

²³⁹ For some SIN, in addition to land areas, the perimeter also covers marine areas: in total, this area is just under 78,000 hectares.

²⁴⁰ As far as groundwater is concerned (see Environmental Data Yearbook, ISPRA), 64% of the surface area was declared contaminated, remediation/security measures were approved for 18% of the surface area, and the process was concluded for 12% of the surface area.

Figure 46: Contamination status of sites – Regional distribution*
2021, (% of total ongoing regional proceedings)



* The data for Trentino-Alto Adige are calculated as the average of the values available for the provinces of Trento and Bolzano.

** Ratio of total contaminated or potentially contaminated sites to total sites with unfinished proceedings.

Source: Elaboration on ISPRA data.

With regard to **air pollution**, despite a long-term emission reduction pathway, in 2021 approximately 97%²⁴¹ of the European population was exposed to air pollutants exceeding the World Health Organisation (WHO) guidelines²⁴². In particular, higher average values were recorded in Northern Italy and Central and Eastern European countries, due to emissions generated mainly by domestic heating consumption and the manufacturing sector.

In order to assess the state of **health in Italy**²⁴³, an overview of the state of air pollution at national level is presented below. This takes into consideration both the pollutants with the greatest impact on human health and ecosystems (nitrogen dioxide and ozone)²⁴⁴, and the presence of particulate matter (PM₁₀ and

²⁴¹ EEA (2023), "Europe's air quality status".

²⁴² By 2030, European assessment *standards* are expected to be aligned with those of the WHO as stated in the Revision EU ambient air quality legislation (europa.eu), in particular, reference can be made to *Annex I "Air quality standards"*.

²⁴³ The data for the analyses come from the National System for Environmental Protection (SNPA, 2023), 'Air Quality in Italy in 2022'. In general, reference is made to annual averages of values to briefly describe the 'chronicity' of air pollution in an area, while the daily exceedance is instead useful to assess any peaks in concentration of the phenomenon considered.

²⁴⁴ These are some of the various hazardous substances that can be found in the air but are used as a recognised benchmark because there is a correlation between exposure and short- and long-term health effects. As defined by ISTAT (Glossary, Urban Environment): nitrogen dioxide is a pollutant with a predominantly secondary component, as it is the product of the oxidation of nitrogen monoxide (NO) in the atmosphere, only to a lesser extent released directly into the atmosphere. The main source of nitrogen oxide emissions (NO = NO + NO₂) is vehicle traffic, followed by civil and industrial heating, energy production and many industrial processes. It has negative effects on health and contributes to the precursor photochemical smog processes for the formation of ozone and secondary particulate matter; ozone is a secondary pollutant that forms in the atmosphere through photochemical processes in the presence of primary pollutants such as nitrogen oxides (NO_x) and volatile organic compounds (VOCs). As well as being local, photochemical pollution is a transboundary phenomenon that unfolds over large spatial scales, with the result that the levels found in a given area are not always exclusively attributable to emission sources located near the same area. The highest ozone concentrations occur in the hottest months

PM_{2.5}). In addition, a comparison is made for each pollutant/particulate matter with the most restrictive limits set by the WHO²⁴⁵.

With reference to **nitrogen dioxide**, the 2022 data show that the **average annual limit** (40 µg/m³) was **complied with in most of Italy** (97.5% of the measurement stations) with a **significant improvement over the 2013 values** (82.9%). Data above the threshold were recorded mainly in urban areas characterised by significant traffic volumes (Turin, Milan, Bergamo, Genoa, Florence, Rome, Naples, Catania and Palermo). Looking at the WHO limits (20 µg/m³ for the annual average), 42.5% of the measuring stations exceed the permitted values.

With regard to **ozone**, the 2022 data show that the long-term objective for human health²⁴⁶ (120 µg/m³) was met at 11.3% of the measuring stations, with values that were in any case an **improvement compared to 2013** (6.5%). Most of the breaches were recorded in the **Po Basin area**. Compared to the WHO values (no more than three exceedances of the 100 µg/m³ value), almost all monitoring stations showed higher values (91% of cases).

With reference to **PM₁₀**, the 2022 data also show an improvement compared to 2013: the annual limit value (40 µg/m³) was **exceeded in only two stations** (out of 561), while for the average daily threshold (50 µg/m³ not to be reached more than 35 times in a year), the deviation was observed in 113 stations (20% of cases compared to 37% in 2013), with particular evidence in the Po Basin area. Taking the WHO threshold (20 µg/m³ annual average) into consideration, the exceedance concerns 66% of the stations nationwide.

Finally, with regard to **PM_{2.5}** in 2022, the annual limit (25 µg/m³) was **complied with at almost all stations** (98.7% of the measurements compared to 85.8% in 2013). Considering the values indicated by the WHO (10 µg/m³), values above the threshold were recorded at 78% of the stations.

To obtain a summary data on air pollution conditions, a synthetic index²⁴⁷ declined at the provincial level was taken into consideration. The data confirm that, compared to the Italian average, worse air quality (with an index value of less than 100) is observed for the provinces of the **Po Basin area** and, more generally, for those characterised by more marked levels of urbanisation and industrialisation (Figure 47). In this regard, it is worth mentioning that part of the proceeds raised with the issue of the **2045 BTP Green** in 2021 financed specific interventions aimed at improving the quality of the area precisely in the regions of the Po Basin.

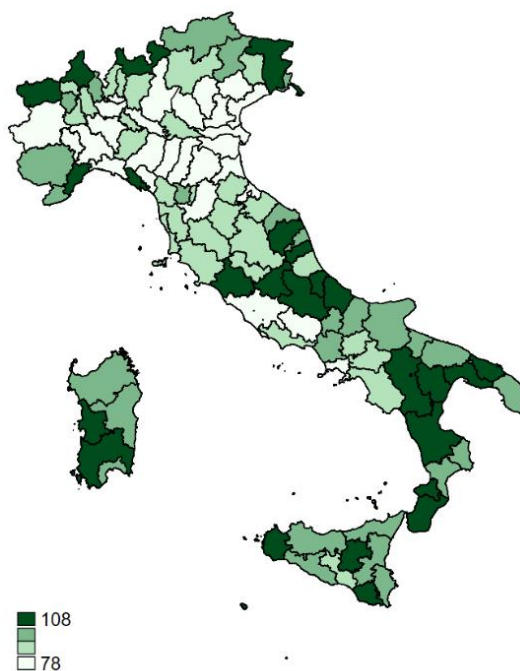
and at peak radiation times. In urban areas, ozone is formed and transformed very rapidly following complex dynamics that differ from other pollutants. The main sources of ozone precursors (NO_x and VOCs) are road transport, domestic heating and energy production. Ozone is a source of serious problems for human health, the ecosystem as a whole, agriculture and material goods.

²⁴⁵ See Note 242.

²⁴⁶ See Legislative Decree 155/2010; the maximum daily value of the average ozone concentration calculated over 8 consecutive hours.

²⁴⁷ This is a synthetic indicator created by Cerved (Sustainable Italy Report, 2022) starting from three sub-indicators from ISTAT: the annual average NO concentration₂, the annual average PM concentration₁₀ and the density of fixed air quality monitoring stations (per 100 km²). If the index is below 100, it denotes a worse pollution condition than the national average.

Figure 47: Synthetic pollution indicator
2021, (index number, Italy = 100)



Source: Cerved.

Combating water pollution

EU initiatives to achieve zero pollution also concern the protection of **freshwater and marine ecosystems** through constant monitoring of their health status and the penetration of contaminants.

On this specific line of intervention, the **2035 BTP Green**, issued in 2022, financed initiatives in the 2019-2022 four-year period for more than **EUR 61 million**, with a focus on clean-up activities and monitoring of the environmental status of water, also in relation to the application of specific international protocols²⁴⁸.

With regard to the monitoring of the **presence of waste**, since 2015, through the “Marine Strategy Framework Directive”²⁴⁹ within national borders, an important monitoring activity has been initiated. In order to have a synthetic view of the phenomenon, the following two indicators were considered.

- **Volumes of beached litter:** in 2021, the median total marine litter beached was 273 per 100 metres of beach, **down from the peak reached in 2018** (462/100mt), although far from the threshold value of 20 litter per 100 metres set by the EU Directive as a requirement for the definition of a “clean beach”. More than 30% of the sampled waste refers to single-use plastic objects²⁵⁰, i.e., those covered by the EU Single Use Plastics Directive²⁵¹.
- **Clean Coast Index (CCI):** this index classifies beaches into different categories based on the users' perception of the state of cleanliness. In 2021, the **percentage of dirty or very dirty beaches was low**, was ranging from 9% in spring to 10% in autumn.

²⁴⁸ Reference is made specifically to the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution (1978), as described in section 6.

²⁴⁹ Marine Strategy Directive 2008/56/EC.

²⁵⁰ ISPRA (2023), 'Environment in Italy, Yearbook 2022'.

²⁵¹ See Directive (EU) 2019/ of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of plastic waste on the environment.

The **health of national waters** can, on the other hand, be assessed through some of the measures related to the biological quality element (BQE) of marine environments²⁵².

- **Concentration of chlorophyll-phytoplankton**²⁵³: in 2020, **71.5%** of the survey stations were observed to have a **high quality of the marine environment**, the remaining cases denoting a good or sufficient state (12.3% and 16.2% respectively). With regard to the BQE of lakes, just over 50% of the surveys indicate a good or better status.
- **PREI Index** (*Posidonia Rapid Easy Index*): the measurement, aimed at assessing the health of *Posidonia oceanica* meadows²⁵⁴ showed that **80%** of the survey stations **reached the quality standard** in the 2016-2019 period.

²⁵² See European Directive 2000/60/EC and Environment Ministerial Decree 260/2010. The survey is carried out every three years.

²⁵³ The indicator is based on the estimation of phytoplanktonic biomass, providing a measure of the main photosynthetic pigment present in microalgae, as a proxy for disturbances in the environmental quality of marine waters.

²⁵⁴ An aquatic plant with fundamental functions for the marine ecosystem both because it is home to many animal and plant species in its prairies and because it produces oxygen and protects shorelines from erosion.

15 Protecting biodiversity and the health of eco-systems



The protection of biodiversity and the health of eco-systems is the cornerstone of nature protection stated at European level in the **EU Biodiversity Strategy for 2030**²⁵⁵ and is a key element of the European Green Deal.

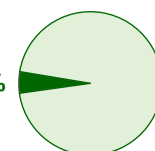
Indeed, there is a consensus on the need to step up efforts to tackle the direct and indirect causes of biodiversity and natural resource loss, including overexploitation of natural resources, climate change, pollution, invasive alien species, and the way land and sea are used. Achieving this result requires the full integration of biodiversity targets in other sectors, such as agriculture, fisheries and forestry.

Italy has fully endorsed this multidisciplinary approach in its **National Biodiversity Strategy for 2030**²⁵⁶ recalling the need to put in place timely and continuous measures for the increase of knowledge, conservation and valorisation of this particularly rich heritage of the country.










At the same time, the implementation of measures to protect the environment and biodiversity is often accompanied by positive effects from the perspective of the mitigation and adaptation to climate change. In pursuit of these aims, part of the proceeds raised through the issue of green government bonds is allocated to the objective of **Protection of the environment and biological diversity** (category 5 of the **GBF**), as reported in section 7.

15.1 Marine Protected Areas, National Parks and State Nature Reserves

5.10%



% 2019-2022 allocated resources

UN Sustainable Development Goals					EU environmental objectives				CATEGORY 5
									Protection of the environment and biological diversity
Subcategories of eligible expenditure					2019	2020	2021	2022	
Marine Protected Areas, National Parks and State Nature Reserves					14,445	81,567	193,837	123,139	412,989

(values expressed in EUR thousand)

²⁵⁵ https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

²⁵⁶ The Ministry of Ecological Transition's National Biodiversity Strategy 2030 sets as a strategic objective to 'build a coherent network of terrestrial and marine protected areas': The same National Strategy also sets specific objectives, such as: to legally protect at least 30% of the land surface and 30% of the marine surface through an integrated system of protected areas, Natura 2000 network and other legally protected areas (A.1); to ensure that at least one third of legally protected areas on land (including all primary and ancient forests) and at sea are strictly protected (A.2); to ensure the ecological-functional connection of protected areas on a local, national and supranational scale (A.3); to effectively manage all protected areas by defining clear conservation objectives and measures and monitoring their implementation appropriately (A.4); and to ensure the necessary financing of protected areas and biodiversity conservation (A.5).

BTP Green emissions in 2022 contribute to the achievement of Italy's **biodiversity protection and ecosystem health objectives** by allocating specific resources: *i)* to the **Italian Forest Fund**; *ii)* to measures for the protection of **monumental trees** and ancient forests; *iii)* to **national parks and protected areas**; *iv)* to **marine reserves**.

In Italy, the system of environmental protection areas is formed by the integration and overlapping of national and regional protected areas and the **Natura 2000 network**²⁵⁷, an ecological network spread over the territory of the European Union, established as an implementation of the Birds and Habitats Directives.

The system of national and regional **protected areas** comprises **871 protected areas**²⁵⁸, representing over **3 million hectares on land**, almost as many at sea and over **650 kilometres of coastline**. Adding to these the approximately 2,600 Sites of Community Interest (SCIs) and Special Protection Areas (SPAs) of the **Natura 2000 Network**, we reach a total protected area in Italy of approximately **10 million hectares of land surface**, almost 20% of the national territory, and **3 million hectares of sea surface**, equal to 13% of the waters under Italian jurisdiction²⁵⁹. In addition to these areas, there are the so-called *Other effective area-based conservation measures* (OECM)²⁶⁰: areas other than protected areas, which although established with a different objective, make an effective contribution to the conservation of biodiversity.

This vast system of variously protected areas is widely distributed throughout the country: suffice it to know that one in two municipalities falls within a protected area or within a Natura 2000 Network site and that the first seven Italian municipalities by number of inhabitants have at least one protected area within their borders (Figure 48).

On the other hand, as the European Biodiversity Strategy points out, the current network of national protected areas is not yet sufficiently extensive and interconnected to guarantee adequate protection of biodiversity. Therefore, objectives are set by the European Strategy for 2030, fully recalled by the National Strategy, which envisage **effectively protecting at least 30% of the land surface and 30% of the sea**, of which at least 10% (both on land and at sea) at a 'strictly protected' level²⁶¹, i.e. with a protection regime that is rigorous enough to leave natural processes intact, including all the primary and ancient forests still existing on the territory. This means that Italy will have to increase, in the coming years, the protected land area by 10 percentage points and the protected sea area by 17 points, according to increasingly strict regimes.

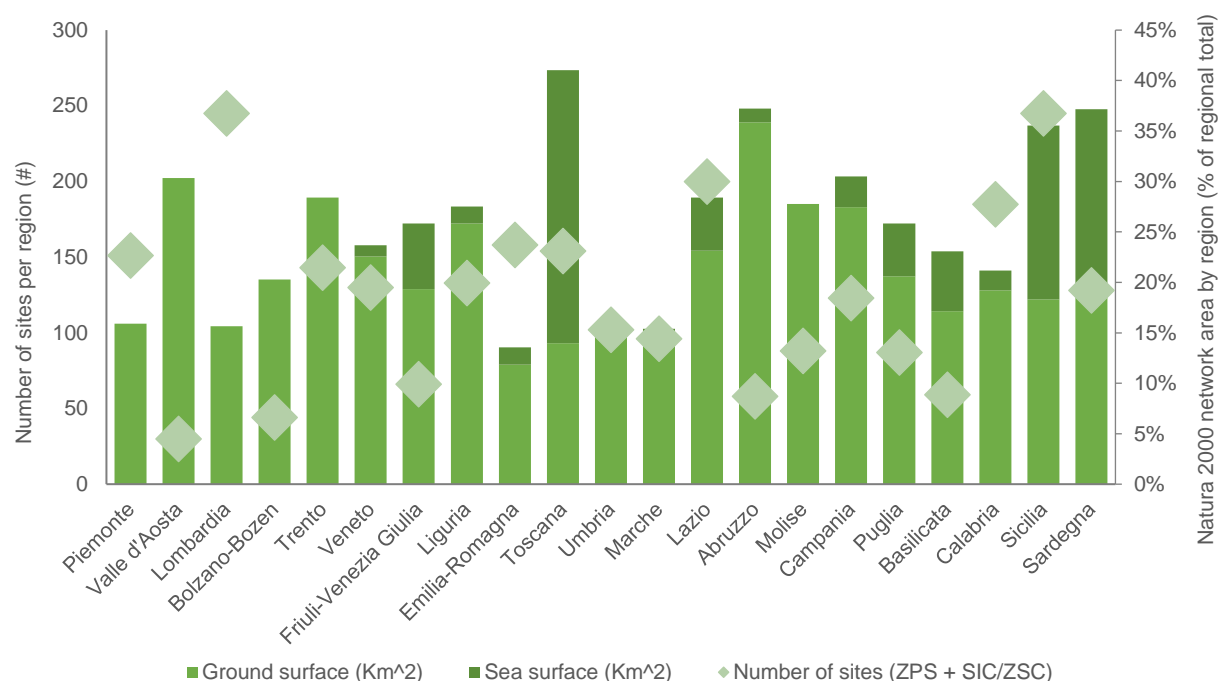
²⁵⁷ The Natura 2000 network is an ecological network for the conservation of biodiversity, spread over the entire territory of the European Union, consisting of: Special Protection Areas (SPAs) established by member states pursuant to the Birds Directive 79/409/EEC (subsequently repealed and replaced in its entirety by 2009/147/EC, which maintains its fundamental objectives), transposed in Italy by Law no. 157 of 11 February 1992, for the protection and management of all species of naturally occurring birds in the wild state in the European territory; Sites of Community Interest (SCI), identified by Member States pursuant to the Habitats Directive 92/43/EEC (implemented in Italy by Presidential Decree 357/97 amended and supplemented by Presidential Decree 120/2003) to ensure the long-term maintenance of natural habitats and species of wild flora and fauna that are threatened or rare at Community level. SCIs are subsequently designated as Special Areas of Conservation (SACs) under Article 4 of the Directive. The general objective set by the reference legislation is to maintain the favourable conservation status of the areas included in the Natura 2000 Network, which represent environments of great importance for habitats and animal and plant species and, in general, for the conservation of biodiversity.

²⁵⁸ <https://www.mite.gov.it/aree-protette>

²⁵⁹ ISPRA data, National System for Environmental Protection, last updated April 2020.

²⁶⁰ 'A geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant values.' (CBD, 2018). Note 12 of the National Biodiversity Strategy 2030 of the Ministry of Ecological Transition, Directorate General for Natural Heritage, Division III - Biodiversity, Flora and Fauna, CITES, Published on 14/04/2022.

²⁶¹ Cfr. COM(2020) 380 final (https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0009.02/DOC_1&format=PDF).

Figure 48: Natura 2000 network sites by region. Numbers and extension in km² on land and sea (2020)

Source: Elaboration on ISPRA data; values net of any overlaps between SIC-ZSC and ZPS.

The interventions financed through the proceeds raised through the issue of green government bonds are also in line with **Italy's conservation and sustainable development commitments undertaken at the international level** and linked, in particular, to: *i) the Aichi Target²⁶² no. 11 of the Strategic Plan of the United Nations Convention on Biological Diversity²⁶³; ii) to the objective of achieving Good Environmental Status of the European Union's Marine Strategy Framework Directive; iii) to the SDGs of the United Nations 2030 Agenda No. 14 (Life Under Water)²⁶⁴ and No. 15 (Life on Land)²⁶⁵.*

Therefore, the resources allocated to the protected areas system help to guarantee the essential function of **protecting the biodiversity of species and habitats in the national context** (also through research projects and reintroduction and repopulation operations). Overall, in fact, the protected area system ensures a coverage of almost **76% of terrestrial and mountain ecosystems** and **85% of freshwater ecosystems** with respect to the 172 key areas for biodiversity²⁶⁶ surveyed in Italy, which, however, must further progress towards the goal of total coverage²⁶⁷.

²⁶² These are 20 targets (also called *Aichi Targets*, named after the place where the 10th Conference of the Parties to the Convention was held, i.e. Nagoya, Aichi Prefecture, Japan) to protect biodiversity identified in the UN Convention on Biological Diversity signed by 200 countries in 2010 and underlying the Strategic Plan for Biodiversity 2011-2020.

²⁶³ Aichi Target 11: By 2020, at least "10 per cent of marine and coastal areas, especially areas of special importance for biodiversity and ecosystem services, are conserved through an equitably managed, ecologically representative and well-connected system of protected areas".

²⁶⁴ United Nations, Agenda 2030, Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

²⁶⁵ United Nations, Agenda 2030, Goal 15: Protect, restore and promote sustainable use of the terrestrial ecosystem.

²⁶⁶ Key biodiversity areas (KBAs) are "sites that contribute significantly to the global persistence of biodiversity, whether on land, in fresh waters or in the seas" (IUCN, *A global standard for the identification of key biodiversity areas* 2016). The degree of coverage of KBAs by national protected area systems is an indicator of countries' progress in biodiversity conservation.

²⁶⁷ The target of full coverage is set under Goal 15 of the UN 2030 Agenda.

Protecting the health of ecosystems is, in fact, particularly important, if we consider that **Italy boasts the highest rate of biodiversity in Europe**, with almost **8 thousand plant species**²⁶⁸ (about 50% of European species) and **60 thousand animal species** (about 30% of those in the entire continent) and an endemism rate²⁶⁹ (percentage of species found only on Italian territory) of 15% for flora and 20% for terrestrial and freshwater fauna. Forests, in particular, are a unique biodiversity hotspot, if we consider that 45% of national forest ecosystems are composed of 4-5 different species of trees (against a European average of 2-3 species) and that more than a quarter are composed of 6 or more species of trees (while in Europe, monospecific structures cover as much as 30% of the forest surface). A very rich heritage, therefore, in an area equal to just one thirtieth of the European one²⁷⁰, but vulnerable and therefore in great need of protection. Almost 30% of Italy's natural habitats are threatened (most of which are connected to wetland, coastal and riparian environments), as are 45% of vertebrate animals, 15% of higher plants and 40% of lower plants²⁷¹.

In addition to the protection of biodiversity, the system of protected areas, both marine and terrestrial, also influences the **pursuit of climate mitigation goals**, thanks to its capacity to absorb climate-changing emissions²⁷².

In Italy, a total of **4.5 billion tonnes of carbon dioxide are absorbed annually by national forests**²⁷³. Marine areas also play an important role in absorbing carbon dioxide, with an absorption capacity, on a global level, equal to about 25% of the CO₂ emitted each year by human activities. Particularly relevant is the **role of the Mediterranean**, if we consider the particular capacity of posidonia to contribute to the reduction of CO₂ emitted. It is an endemic plant in the Mediterranean Sea, with more than 200 meadows mapped in the Italian seas alone²⁷⁴. One hectare of posidonia is able to retain almost 10 times the amount of CO₂ of temperate forests²⁷⁵, and to produce around 14 litres of oxygen per square metre each year²⁷⁶.

In the period of this allocation, **BTP Green** has also destined resources to the **forest system**, in particular through the Italian Forest Fund, and contributions for the protection and enhancement of monumental

²⁶⁸ 'An updated checklist of the vascular flora native to Italy', Plant biosystems, 2018. The figure exceeds 12 thousand specimens if algae and lichens are added.

²⁶⁹ On a national level, the areas with the highest density of biodiversity and endemism are the Tyrrhenian islands, some sectors of the Apennine chain, and the Maritime and Ligurian Alps. See ISPRA.

²⁷⁰ Also from the point of view of the so-called 'Important Areas', the Italian territory is rich in areas of interest for flora (15% of its surface area) and fauna (over 45% of its surface area).

²⁷¹ The 'Italian red lists' published by the IUCN (International Union for Conservation of Nature) indicate that 43% of the 202 flora 'policy species' (species protected by the Bern Convention and the Habitats Directive 92/43/EC), included in the risk categories CR (critically endangered), EN (endangered) and VU (vulnerable), are threatened or at risk of extinction, and 8 vascular plants and 3 bryophytes are extinct or probably extinct. Among Italian vertebrates, 21% of cartilaginous fish, 48% of freshwater bony fish, 2% of marine bony fish, 19% of reptiles, 36% of amphibians, 23% of mammals and 27% of breeding birds are at risk of extinction (categories CR+EN+VU) (Source: ISPRA). The ibex, Marsican bear, Apennine chamois and osprey are some of the species that protected areas have saved from extinction.

²⁷² On average, a tree (such as a tall tree species), in a temperate climate located in a city (thus a context of higher environmental stress than a natural context), can absorb between 10 and 30 kg CO₂/year, within a growth cycle in which the tree reaches maturity in an average time range of 20 to 40 years. In contrast, a tree (such as a tall tree) in a natural setting, where less stunted growth can be expected, has an average uptake potential of between 20 and over 50 kg CO₂/year, within an average time range of 20 to over 30 years.

²⁷³ Plants extract CO₂ from the atmosphere and store it in their leaves, trunks, stems and roots. The amount of carbon fixed in agroforestry pools and the equivalent carbon dioxide (CO₂) removed from the atmosphere is quantified by measuring biomass, expressed in terms of dry weight, i.e., weight in the absence of water (anhydrous). In fact, the carbon fixed in plant tissues (wood, leaves, etc.) constitutes about 50% of the biomass, while the carbon dioxide equivalent is obtained by multiplying the carbon content of the biomass by the ratio between the molecular weights of carbon dioxide and elemental carbon (44/12 = 3.67). Most of the organic carbon in Italian forests is accumulated in soils, which contain almost 60% of the total, while the second largest pool is the epigeal tree biomass (about 8% of the total). Lastly, 24.9 and 28.3 Mt of organic carbon are accumulated in litter and necromasses respectively, representing 2.0% and 2.3% of the total carbon. The Kyoto Protocol also expressly envisages forest absorption as a climate mitigation activity, complementary and supplementary to the reduction of emissions 'at source'.

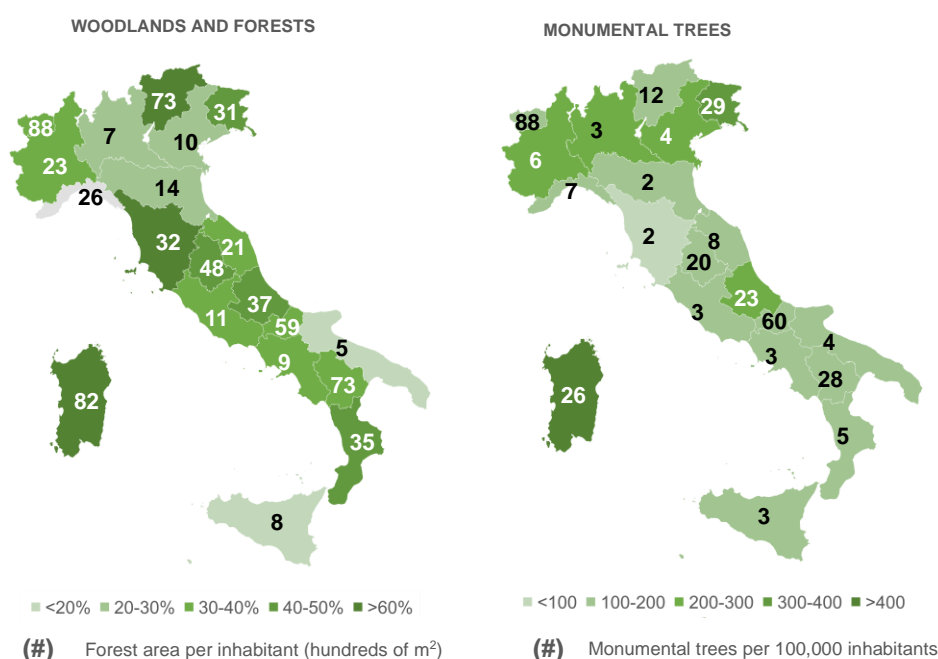
²⁷⁴ The Sea Protection Service of the MASE has defined a specific plan for mapping posidonia along the Mediterranean coasts, according to the National Programme for the identification and enhancement of Posidonia oceanica, revised by Law No 426/1998. Over 200 meadows have been mapped in Italy: 25 in Liguria, 7 in Tuscany, 15 in Latium, 16 in Apulia and 1 in Basilicata, 60 in Sicily and the smaller islands, 14 in Sardinia, 36 in Campania and 30 in Calabria.

²⁷⁵ Major studies have shown that a posidonia meadow one square kilometre in size absorbs up to 83,000 tonnes of carbon CO₂, while an aboveground forest of the same size absorbs only 30,000 tonnes (Nature, *Ecology & Evolution*).

²⁷⁶ MASE, NaturalItalia, <https://www.naturalitalia.it/cartografiaPrateriePosidonia.do>

trees²⁷⁷, old-growth forests²⁷⁸ and forest materials. There are about **11 million hectares of forest area**²⁷⁹, equal to almost 37% of the national territory. It is a heritage that is also growing, with an average increase in the volume of epigeal biomass²⁸⁰ of more than 2% per year and an overall increase of almost 6% in forest area in the decade 2005-2015²⁸¹. On the other hand, there are about **four thousand monumental trees** nationwide, one third of which are in urban areas (Figure 49).

Figure 49: Regional woodlands and monumental trees



Source: Elaboration on MASE (2019), INFC (2015), ISTAT (2022) and MASAF (2022) data.

The colour of the regions indicates their range in terms of forest area in relation to total area and number of monument trees in the region. The numbers in the labels indicate, respectively, the area of forest (expressed in hundreds of m²) per inhabitant and the number of monument trees per 100,000 inhabitants per region.

²⁷⁷ Monumental trees, rows of trees and plantations of special landscape, natural, monumental, historical and cultural value referred to in Article 7 of Law No 10 of 14 January 2013. Departmental Decree No. 5450 of 19 December 2017 approved the List of Monumental Trees of Italy. The most recent update of the national list was approved by Executive Decree No. 330598 of 26 July 2022.

²⁷⁸ Pursuant to Legislative Decree No. 34 of 3 April 2018, Art. 3(2)(s-bis) and Art. 7(13-bis), on the basis of the guidelines for the identification of areas that can be defined as old-growth forests, approved by Ministerial Decree No. 604983 of 18.11.2021.

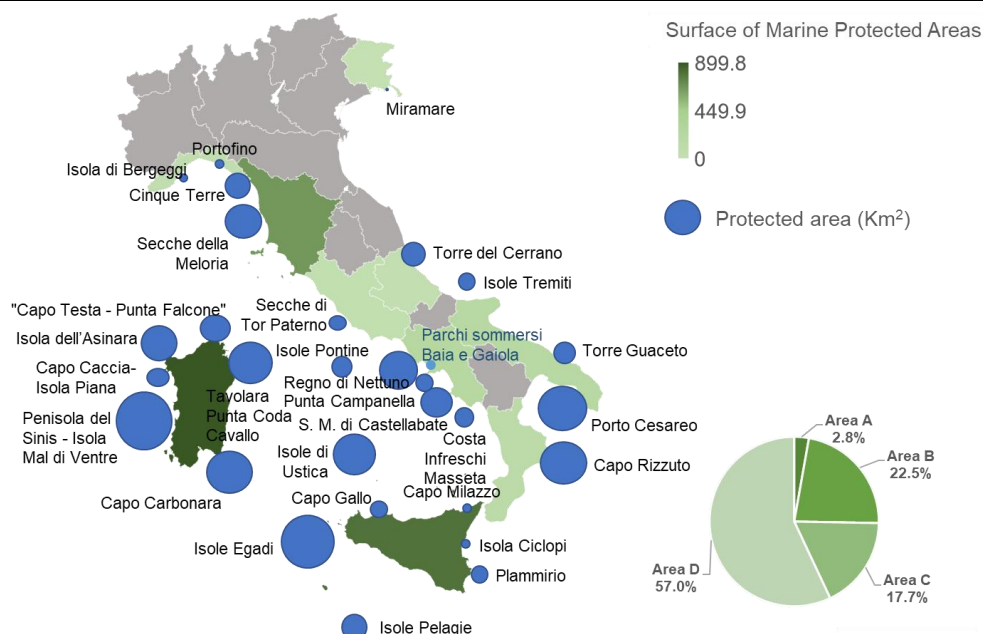
²⁷⁹ National Inventory of Forests and Carbon Sinks (INFC2015): this is a sample survey carried out by the Carabinieri through the Environmental and Agri-food Forestry Unit Command, in collaboration with CREA, the scientific partner, and the support of the Forestry Corps of the Regions and Autonomous Provinces. The results, definitions and classifications adopted and the survey and data processing methods are described in: P. Gasparini et al. (eds.), *Italian National Forest Inventory - Methods and Results of the Third Survey*. Main results are also summarised in De Laurentis D., Papitto G., Gasparini P., Di Cosmo L., Floris A. (2021), "Le foreste italiane - Sintesi dei risultati del terzo Inventario Forestale Nazionale" (INFC2015). Work is currently underway towards the new Forest Inventory 2025.

²⁸⁰ The IPCC guidelines (2003), which were drawn up to account for the balance between carbon released into the atmosphere and carbon absorbed by terrestrial ecosystems in the context of climate agreements (UNFCCC, Kyoto Protocol), identify five different carbon pools: (1) the epigeal biomass (*above-ground biomass*), consisting of all the tissues that make up the aerial parts of living plant organisms (stems, branches and stumps, including bark, leaves, seeds and fruits); (2) the *below-ground biomass* (*below-ground biomass*), consisting of the root systems of living plant organisms; (3) the necromass (*deadwood*), represented by the coarsest woody plant debris (4) litter, consisting of the finest residues (leaves, flowers and inflorescences, fruits and infructescences, twigs, etc.), not yet decomposed; (5) soil, comprising the organic carbon present in the organic and mineral layers, including the finest roots, up to a conventional depth of 30 cm of the mineral layer.

²⁸¹ <https://www.inventarioforestale.org/it/>

Finally, in the 2019-2022 period, **BTP Green** financed the management and promotion of several Marine Protected Areas, in particular the 29 areas included in the Official List of Protected Areas²⁸³ (EUAP) and the 2 underwater parks located in the waters of Baia in the Gulf of Pozzuoli and Gaiola in the Gulf of Naples, but also the marine environment protection service and the expenses in execution of the cetacean conservation agreement (Figure 50).

Figure 50: Distribution of proceeds and characteristics of Marine Protected Areas



Source: Elaboration on MASE date.

²⁸² Including state and regional parks and nature reserves and other regional protected areas.

²⁸³ Identified under Law no. 388 of 2000, art. 114, paragraph 10 'Provisions for the formation of the annual and multi-year State budget - 2001 Financial Law' (Official Gazette no. 302 of 29 December 2000 - Ordinary Suppl. no. 219) and subsequent Decree of 7 August 2002 (Official Gazette no. 285 of 5 December 2002). The funding provided for the management of the submerged parks is in the nature of protection and conservation of marine biodiversity, which is of considerable biological importance due to the extreme geomorphological complexity of its seabed, guaranteed by the favourable circulation system of coastal waters that have allowed numerous marine biological communities typical of the Mediterranean to settle in a few hectares of sea, including the coralligenous biocenosis. In addition, the underwater parks are also home to the following Sites of Community Importance and Special Biological Conservation Area: on BAIÀ the SCI/SAC IT8030040 Seabed of Baià; and on Gaiola the SCI/SAC: IT8030041 Seabed of Gaiola and Nisida.

national territorial waters (3% of MPAs) are subject to integral protection restrictions (so-called A zone)²⁸⁴. In Italy, in addition to the 29 blue protected areas included in the Official List (EUAP), there are 2 submerged parks in Campania, the International Sanctuary for Marine Mammals, and a further 8 areas designated at national and regional level, for a total of **39 marine areas subject to protection**²⁸⁵, distributed in 10 Italian regions, covering a surface area of over **300,000 hectares of sea** (up 17% compared to 2013²⁸⁶). Sicily and Sardinia are the regions with the highest incidence and territorial extension (respectively, almost 900 and almost 800 km²) and possess more than half of the MPAs at the national level. Tuscany is the region with the highest incidence of protected waters (corresponding to about 660 km²) and the largest Site of Community Importance (SCI) in the Mediterranean for the protection of marine dolphins. The Italian seas also stand out for the variety of marine species, amounting to 10% of those present in national and international flora and fauna checklists (8,750 species equal to 18% of all known marine species).

Also through the financing of expenses for the management and promotion of MPAs, **BTP Green** therefore contributes to the achievement of environmental objectives related to the protection of the biodiversity of ecosystems and the fight against climate change. The provision of more resources to the Managing Authorities is in fact essential in order to strengthen the management and monitoring activities closely linked to the protected area, thanks to the role played by MPAs for the ecological recovery of marine habitats and the resilience of the species that live there, reducing anthropic stress factors such as irresponsible fishing and tourism, as well as in terms of CO₂ absorption and combating climate change.

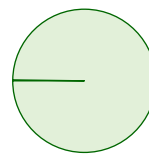
²⁸⁴ In Italy, MPAs are usually divided internally into zones called A, B, C and D, which are subject to different environmental protection regimes, taking into account their environmental characteristics and socio-economic situation. More specifically, A zone is an integral reserve, forbidden to all activities that may cause damage or disturbance to the marine environment. Only scientific research and service activities are generally permitted in this zone. B zone, a general reserve zone, where a series of activities are permitted, often regulated and authorised by the management body, which, while allowing for sustainable use and enjoyment of the environment, result in minimal impact. C zone represents the buffer strip between the areas of greatest naturalistic value and the sectors outside the marine protected area, where activities of sustainable use and enjoyment of the sea with a modest environmental impact are allowed and regulated by the management body, in addition to what is already allowed in the other zones. D zone, present only in rare cases, provides for less restrictive regulation than the other zoning levels. See MASE, ISPRA.

²⁸⁵ Data from the 6th update of the official list of protected areas.










²⁸⁶ Also thanks to the establishment of two new areas: the larger one in Sardinia, called Capo Testa - Punta Falcone (of about 52 Km²), bordering the larger marine area Capo Testa at Isola Rossa (of about 754 Km²), and the Capo Milazzo area (of about 6 Km²), in Sicily, adjacent to the Capo Milazzo seabed.

15.2 Environmental protection, certification and protection of biodiversity

0.21%



% 2019-2022 allocated resources

UN Sustainable Development Goals					EU environmental objectives				CATEGORY 5
									Protection of the environment and biological diversity
Subcategories of eligible expenditure					2019	2020	2021	2022	
Environmental protection, certification and protection of biodiversity					951	3,372	6,282	6,426	17,031

(values expressed in EUR thousand)

Pursuing the European strategy linked to the green transition of consumption and production activities²⁸⁷, in the light of the objectives defined in the "Europe 2020" strategy²⁸⁸, the definition of tools for analysing and assessing products and organisations – both at life cycle level (*Life Cycle Assessment* – LCA)²⁸⁹ and the subsequent communication of environmental performance (*Environmental Footprint*)²⁹⁰ – is now of crucial importance.

Specifically, reference is made to **environmental certification instruments** that can be summarised as follows:

- environmental management systems (such as EMAS)²⁹¹;
- environmental labels (ISO Type I, governed by ISO 14024, e.g., EU Eco-label²⁹²);
- environmental self-declarations (ISO Type II, governed by ISO 14021, e.g., Mobius loop);
- environmental product declarations (ISO Type III, governed by ISO 14025);
- mandatory marking and labelling (e.g., energy-saving labelling)²⁹³.

²⁸⁷ Already the subject of the 'Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy', Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan, Brussels, 16.7.2008, COM (2008) 397 final.

²⁸⁸ Communication from the European Commission 2020 'A strategy for smart, sustainable and inclusive growth', Brussels, 3.3.2010, COM (2010) 2020 final.

²⁸⁹ According to the formula used by SETAC (*Society of Environmental Toxicology and Chemistry*), Life Cycle Assessment is defined as the process of identifying the environmental loads associated with a product, process or activity. The purpose of this assessment process is to identify and quantify, on the one hand, the energy and materials used and, on the other, the emissions released to the environment in order to assess their impact, and to identify and evaluate opportunities for improvement. The assessment encompasses the entire life cycle of the product, process or activity: extraction and transformation of raw materials, manufacture of the product, transport and distribution, utilisation, reuse, storage, recycling, up to and including decommissioning (see SETAC, *Guidelines for Life Cycle Assessment: A Code of Practice*, SETAC, 1993. U.S. Environmental Protection Agency, *The Use of Life Cycle Assessment in Environmental Labelling*, Washington, EPA, 1993, p. 2).

²⁹⁰ The ecological footprint is a complex indicator used to assess human consumption of natural resources against the earth's capacity to regenerate them. Reference is made in particular to Commission Recommendation 2013/179/EU of 9 April 2013 on the use of common methodologies for measuring and reporting environmental performance throughout the life cycle of products and organisations.

²⁹¹ Regulation (EC) No 761/2001 of the European Parliament and of the Council of 19 March 2001 allowing voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), Official Journal of the European Communities L 114/1.

²⁹² The label was established in 1992 by Regulation No. 880 and is now governed by Regulation EC 66/2010 in force in the 28 countries of the European Union and the countries belonging to the European Economic Area.

²⁹³ MASE, 'Environmental Certification', see link: <https://www.mase.gov.it/pagina/certificazione-ambientale>.

Through the resources raised through the issue of green government bonds, the Italian Republic has financed the expenses for the functioning of the **Ecolabel and Ecoaudit Committee**²⁹⁴ for activities concerning environmental certification in the 2019-2021 three-year period, contributing to increasing the levels of protection of ecosystems and biodiversity.

The Ecolabel-Ecoaudit Committee deals with the certification of the European Union's **Ecolabel (EU Ecolabel)**²⁹⁵ issued on a voluntary basis to goods and services that are considered environmentally friendly and, therefore, have a lower environmental impact during their entire life cycle. This certification is issued on the basis of scientific criteria linked to the containment of energy and water consumption; the prevention of pollution (water, air, noise and soil); the development of durable products that are easy to repair and have considerable recycling potential; and the sustainable management of the natural and forest heritage²⁹⁶.

These aims highlight how the strengthening of the Committee's activities and the consequent increase in the number of certificates issued induces a **reduction in CO₂ emissions related to energy and water consumption**, especially in sectors with a high environmental impact²⁹⁷, **greater protection of water resources** and an **improvement in the health and protection of the biodiversity** of animal and plant species. This is achieved through a reduction or elimination of the use of hazardous chemicals in production processes and a concomitant development of a **circular economy** associated with less waste production. In this regard, ARPA Friuli Venezia Giulia has recently estimated that if all the accommodation facilities in the Region adopted the EU Ecolabel, this would result in annual savings of about 126,000 m³ of water (enough to fill 50 Olympic swimming pools), 83,000 tonnes of CO₂ emitted (equal to 15% of the greenhouse gas emissions emitted by regional vehicular traffic on urban routes) and 1,100 tonnes of waste (the equivalent of the average waste produced annually in a municipality of about 2,300 inhabitants)²⁹⁸.

In 2022 Italy remains in the lead in terms of the number of Ecolabel licences and products out of the total number issued at EU level (**16% of licences and 14% of products**) with a number of certifications in line with those granted in Germany (16% of licences and 12% of products), Spain (15% of licences and 21% of products) and France (15% of licences and 11% of products)²⁹⁹.

At the beginning of 2023, there were **414 EU Ecolabel licences** in force in the country, covering a total of **13,243 products/services**, distributed in **17 groups**, with a positive growth trend that has seen the number of active licences almost doubled in the last three years, and the number of certified products and services increased by 34% (Figure 51).

²⁹⁴ The Ecolabel and Eco-audit Committee is the competent body for issuing the European Ecolabel (reg. (EC) 66/2010) and for EMAS registration (reg. (EC) 1221/2009). The Committee operates pursuant to the Decree of the MASE No. 413 of 2 August 1995, and is based on sources of Community law of immediate application in the national legal system and, in particular, Regulations 880/92/EEC, 1980/00/EC, 66/10/EC, 1836/93/EEC, 761/01/EC and 1221/09/EC. See link: <https://www.mase.gov.it/pagina/comitato-lecolabel-e-lecoaudit>. The Committee's activities are financed by chapter 2041 of the state budget.

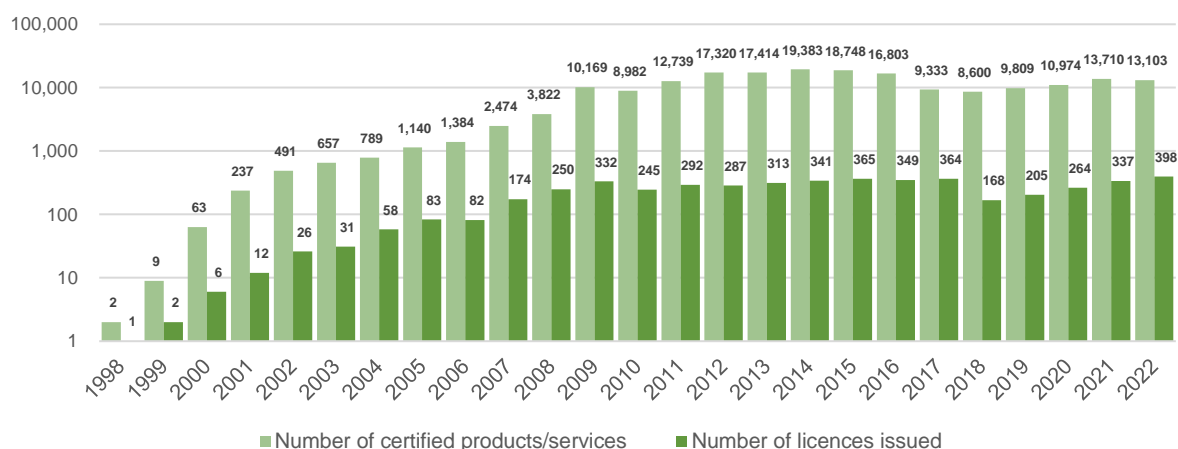
²⁹⁵ The EU Ecolabel was established in 1992 by Regulation No. 880/92 and is today governed by Regulation (EC) No. 66/2010 in force in the countries of the European Union and the countries belonging to the EEA.

²⁹⁶ The Ecolabel guarantees in particular: 1. Durable products, easy to disassemble, repair, reuse and recycle; 2. Minimised CO₂ and pollutant emissions to water and air; 3. Minimised hazardous substances in processes and products; 4. Promotion of the use of recycled materials; 8. Reduced waste and high quality recycles.

²⁹⁷ For example, the textile industry is among those with the greatest environmental impact. Some estimates indicate that it takes 2,700 litres of fresh water to manufacture a single cotton shirt, a volume equal to what a person would have to drink in two and a half years. At the same time, washing synthetic garments is estimated to release 0.5 million tonnes of microfibres into the oceans each year and the fashion industry is responsible for 10% of global carbon emissions (more than all international flights and shipping combined).

²⁹⁸ <https://www.arpa.fvg.it/temi/temi/sviluppo-sostenibile/news/ecolabel-ue-per-il-turismo/>.

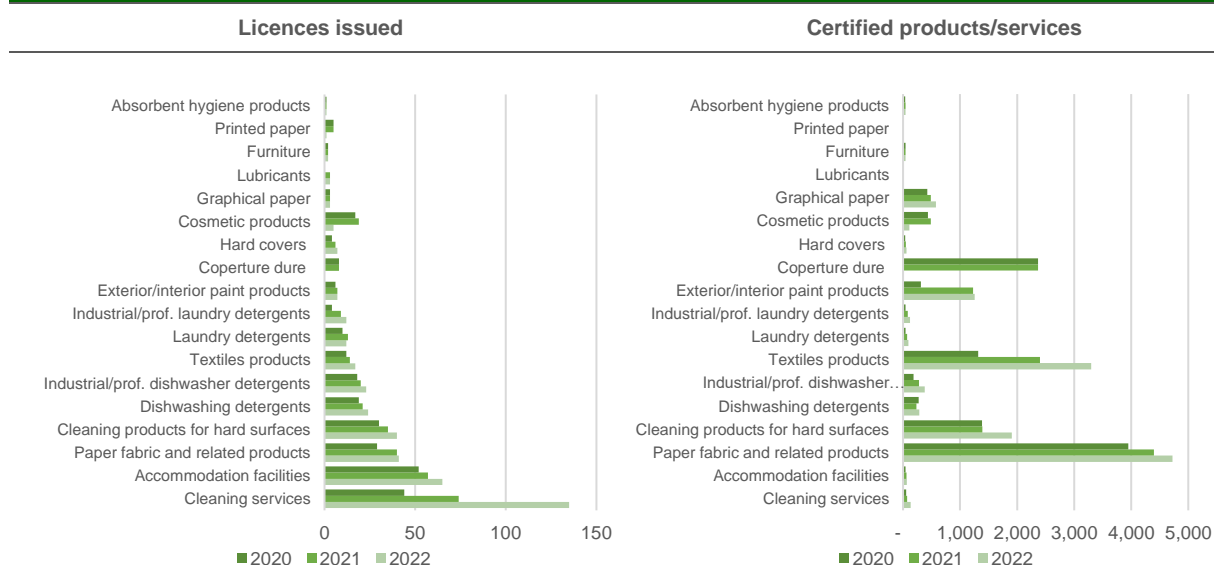
²⁹⁹ European Commission 'EU Ecolabel facts and figures' available at: https://environment.ec.europa.eu/topics/circular-economy/eu-ecolabel-home/business/ecolabel-facts-and-figures_en.

Figure 51: Evolution of the EU Ecolabel in Italy (number of products/services and licences)

Source: Elaboration on ISPRA data (2022). Cumulative data.

The product/service group with the largest number of licences is indoor cleaning services (almost tripled in the last three years), followed by accommodation services, tissue paper and hard surface cleaning products.

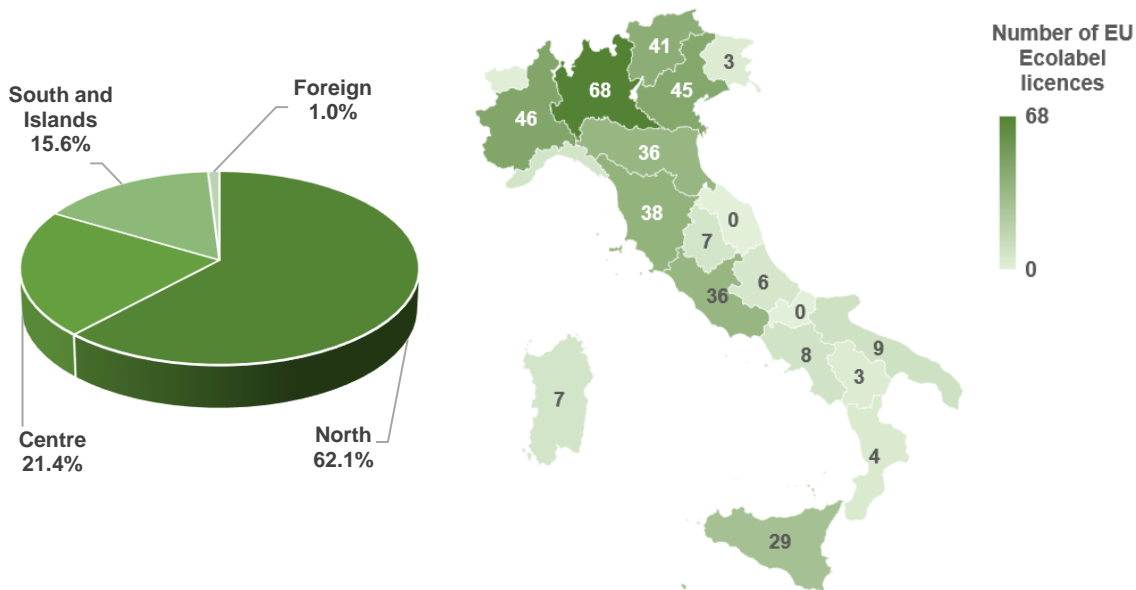
Looking instead at the number of labelled products and services, paper is the sector with the highest number of certified goods, accounting alone for more than one third of the annual total (with a growth of 20% over the three-year period), followed by textiles – with a weight of 25% of the total – and hard surface cleaning - with a relative weight of 15% of the total (Figure 52).

Figure 52: 2020-2022 evolution of EU Ecolabel licences per sector

Source: Elaboration on ISPRA data (2022). Cumulative data.

The licences issued by the Italian Competent Authority show a **clear prevalence in the North** (with a share of 65% of the total licences issued), where the regions of Lombardy, Veneto and Piedmont stand out, while the South remains at the bottom of the national territory, with a share of less than 15% of the total licences (Figure 53).

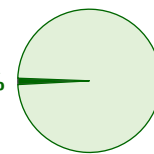
Figure 53: Geographical and regional distribution of EU Ecolabel licences












Source: Elaboration on ISPRA data (2022).

15.3 International cooperation for environmental protection

1.43%



% 2019-2022 allocated resources

UN Sustainable Development Goals					EU environmental objectives				CATEGORY 5
									Protection of the environment and biological diversity
Subcategories of eligible expenditure					2019	2020	2021	2022	
International cooperation for environmental protection					3,614	38,001	37,165	37,294	116,075

(values expressed in EUR thousand)

As reported in paragraphs 6 e 7 – respectively referred to **Pollution prevention and control and circular economy** and to **Protection of the environment and biological diversity** – thanks to the resources raised through the issue of **BTP Green**, the Italian State has financed part of the expenses for the implementation of international conventions, programmes and agreements and for **cooperation activities with international authorities on atmospheric pollution and climate change** and for the **protection of the health of ecosystems and biodiversity**.

The implementation of these conventions, programmes and agreements has contributed to preventing, controlling and reducing air pollution and greenhouse gas emissions, with positive impacts in terms of air quality and fight against climate change, as well as protection of ecosystems and biodiversity.

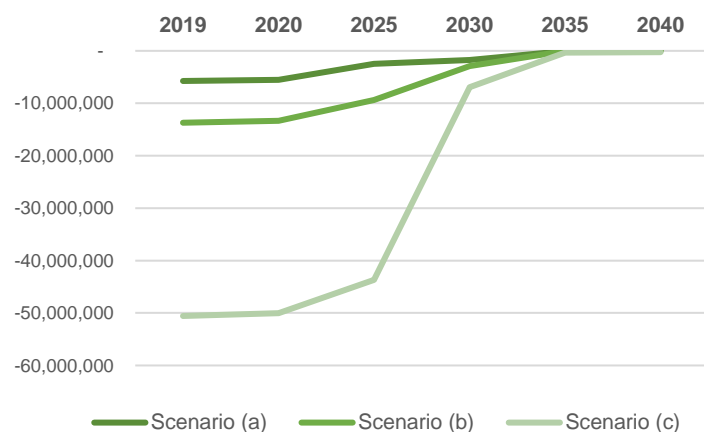
On the basis of the data published on the UNFCCC website, Italy is involved in **128 CDM** (Clean Development Mechanism) **projects**³⁰⁰ registered at the Executive Board, with respect to which, considering only those projects in which Italy is the only proponent, ISPRA estimates **5.6 million tonnes CO₂eq of CDM credits** in 2020 (scenario (a) shown in Figure 54).

On the other hand, with regard to programmes and conventions to protect the health of ecosystems and biodiversity, particular attention deserves the **Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area**, called **ACCOBAMS**, which also includes the **Pelagos Sanctuary** dedicated to marine mammals in the north-western Mediterranean Sea and established by France, Italy, and Monaco.

With the aim of reducing threats to cetaceans and improving knowledge of these species, ACCOBAMS provides for regulatory, surveillance, protection and research actions on **27 species and subspecies of cetaceans** found in the area covered by the agreement and comprising: 14 regularly occurring species or subspecies; 3 species considered to be visitors or occasional visitors to the region; and 10 species that are very rare or nomadic.

³⁰⁰ As clarified by the MASE, the CDM is one of the mechanisms under the Kyoto Protocol (Art. 12) that allows companies in industrialised countries with emission constraints to carry out projects that aim to reduce greenhouse gas emissions in developing countries without emission constraints, and emissions avoided by the implementation of the projects that generate emission credits or CERs (*Certified Emission Reductions*) that can be used for compliance with the assigned reduction commitments. For more details see www.mase.gov.it/pagina/i-progetti-clean-development-mechanism.

Figure 54: projection for scenarios of avoided CO₂ equivalent emissions avoided as a result of international cooperation programmes



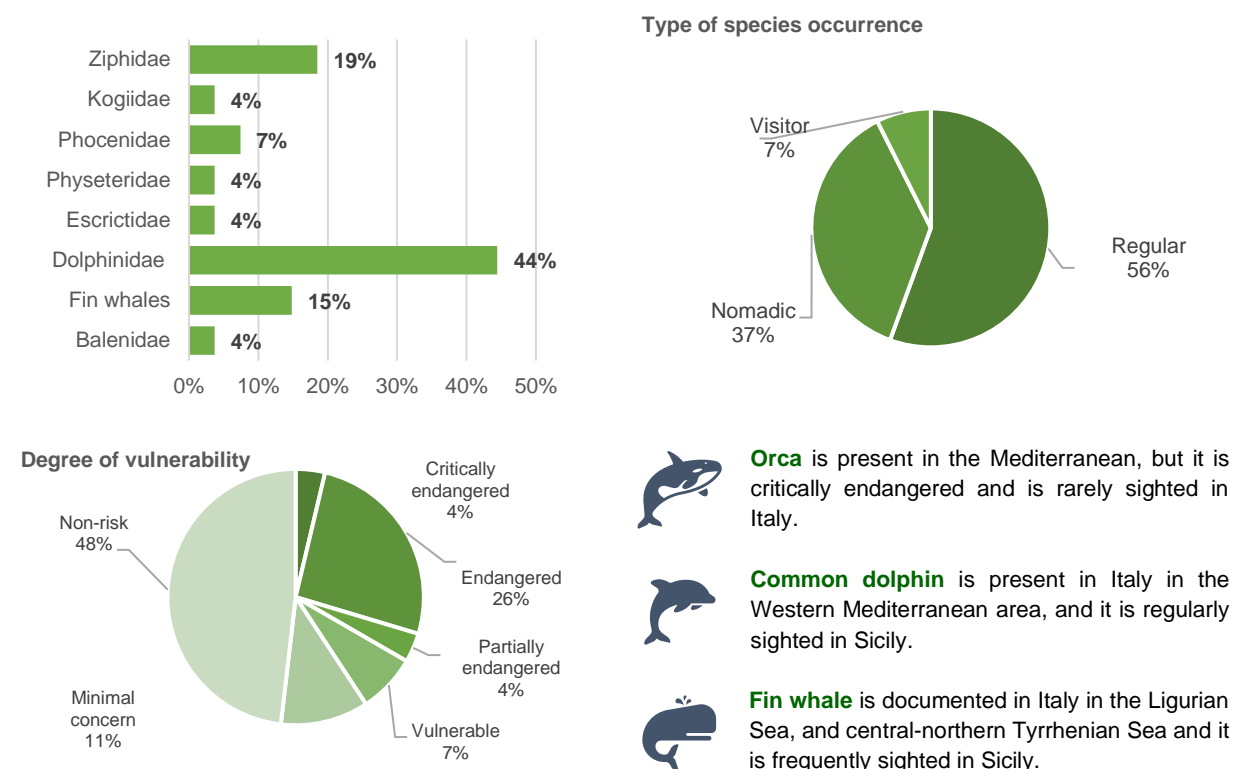
Scenario (a): Total crediting of CO₂eq emission reduction from projects in which Italy is the sole proponent and no crediting of CO₂eq emission reduction from projects shared by Italy with other countries.

Scenario (b): equal distribution of the annual CO₂eq emission reduction shares among countries participating in the project + scenario (a);

Scenario (c): Total crediting to Italy of CO₂eq emission reduction from projects shared with other countries + scenario (a)

Source: Elaboration on ISPRA scenario and IGES, UNFCCC data (2020).

Figure 55: Cetacean species in the ACCOBAMS area



Source: Elaboration on ACCOBAMS data; *Conservation Status Report* 2021.

16 Research



As outlined in section **Errore. L'origine riferimento non è stata trovata.**, part of the proceeds collected from **BTP Green** issues in 2022 financed studies and research initiatives on environmental sustainability included in the State budget in the 2019-2022 four-year reference period.

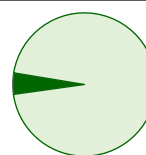
In order to provide a quantification of the environmental impact attributable to these expenditures, a general economic equilibrium model³⁰¹ has been used to estimate the positive impact of research and development (R&D) programmes in terms of reducing CO₂ and other climate-changing gases emissions.

Using this model, it is possible to estimate an inverse relationship between R&D expenditure and the energy intensity of gas and fossil fuels in production processes. Through this transmission channel, therefore, increased research expenditure leads to reduced emissions. At the same time, R&D expenditure, by leading to an increase in total factor productivity, has a positive impact on economic growth, which is, of course, followed by an increase in CO₂ and climate-changing factors. The first impact, however, is more than proportional to the second, with the combination of these two effects meaning that an **increase in research expenditure produces a positive net environmental impact**.











Considering all the measures financed with the **BTP Green** issues that occurred in 2022 and allocated in category 6 of the **GBF** relating to research expenditures recorded in the 2019-2022 period, it is estimated that **more than EUR 400 million of resources allocated by the Green BTP on research could result, in the medium term, in a reduction in CO₂ emissions of approximately 123,000 tonnes per year**. In other words, for every million euro spent on research programmes, there is an average potential reduction in emissions over five years of about 1,500 tonnes of CO₂.

16.1 Main funded institutes and funded projects funded

5.07%



% 2019-2022 allocated resources

UN Sustainable Development Goals	EU environmental objectives				CATEGORY 6
    	    	Research			
Subcategories of eligible expenditure	2019	2020	2021	2022	Total
Contribution to the Euro-Mediterranean Centre on Climate Change (CMCC)	-	-	7,000	7,000	14,000
Contribution to European Centre for medium-range weather forecasts (ECMWF)	2,115	-	5,720	6,516	14,352

³⁰¹ Global economic model provided by Oxford Economics.

<i>Support for scientific and technological research in the Arctic and Antarctic</i>	-	1,000	1,018	20	2,039
<i>ITER-DTT nuclear fusion project</i>	-	-	10,000	-	10,000
<i>Sustainable development, pollution prevention and reduction</i>	413	473	501	575	1,961
<i>Contributions to the Institute for Environmental Protection and Research (ISPRA)</i>	91,366	94,121	95,121	76,280	356,888
<i>Contribution to the Council for Agricultural Research and Analysis of the Agricultural Economy (CREA) and to the Institute for the Agricultural Food Market (ISMEA)</i>	3,143	1,304	5,891	1,415	11,753

(values expressed in EUR thousand)

This section presents some examples of research institutes, programmes and projects financed in the 2019-2022 four-year period through the allocation of proceeds from green government bonds. In accordance with the **GBF**, the **number of funded research programmes and projects** is considered as a measure of environmental impact for the expenditure category “**Research**”.

ISPRA

ISPRA, in addition to participating in numerous projects funded by European Union Programmes relating to research and development, information exchange, training and capacity building (FP7, LIFE, *Horizon 2020*, ENPI), is also active in the context of international initiatives, working groups and technical-scientific committees, with reference to water protection, protection of the atmospheric environment, soil, subsoil, marine and terrestrial biodiversity and the respective crops, as well as the protection of nature and homeothermic fauna.

The projects and publications are divided into **13 thematic areas**: inland waters; physical agents; environment and health; air; biodiversity; climate and weather; sea; open data; sustainable development; science dissemination; environmental emergency and surveillance; geology; soil and land.

Projects are often implemented as part of international collaborations. Below are some significant examples.

With the **Hydrogeological Annals** project, ISPRA has created a computerised interface that allows a query by compartment of the Hydrogeological Annals published by the peripheral compartments of the National Hydrographic and Mareographic Service and the Regional Hydrographic Offices in Palermo, Cagliari and the autonomous provinces of Trento and Bolzano.

The **BIGBANG** model – **Gis BAsed Hydrological Balance at a National Scale on a Regular Grid**, elaborated by ISPRA, produces and makes available monthly estimates of the hydrological balance, i.e., of all hydrological variables of interest for water resource management: total precipitation, real evapotranspiration, surface runoff, aquifer recharge and storage of soil water volumes and in the snow cover.

The **AquaticPollutants** project is carried out in collaboration with JPI Water, JPI Oceans and JPI Antimicrobial Resistance (AMR) in response to *Horizon 2020 Societal Challenge 5 SC 5 21-2019-2020: Risks posed to human health and the environment by pollutants and pathogens present in water*

resources, in order to strengthen the European research area on aquatic ecosystems and address risks caused by pollutants and pathogenic microorganisms.

The **ASI-ISPRA** project (**Thematic Platform of the Sentinel Collaborative GS for Habitat Mapping**, 2017-2021), carried out in collaboration with the Italian Space Agency, implements value-added services in the field of environmental monitoring, through the development of a system for the provision of remotely sensed images and the production of thematic cartography that can be integrated with the one produced by the land and marine services within the Copernicus programme. It is primarily aimed at mapping terrestrial, aquatic and transitional habitats. As part of the project, a Virtual Environmental Services Laboratory (LaViSam) was set up as a development, calculation and test environment for the realisation of the pre-operational services platform.

Through its Environmental Information Systems Service, ISPRA participates in the **Water4All – Water Security for the Planet** partnership, which aims to achieve water security by stimulating systemic transformation and change through a direct channel with the entire research and development chain.

In the **CONCEPTU Maris “Conservation of Cetaceans and Pelagic sea Turtles in Med: Managing Actions for their Recovery In Sustainability”** project, ISPRA – as coordinating beneficiary – participates in partnership with: the International Center for Environmental Monitoring (CIMA Foundation), the **Euro-Mediterranean Center on Climate Change**, EcoOcéan Institut, the MPA of Capo Carbonara, the Zoological Station “Anton Dohrn”, the University of Milan-Bicocca, the University of Palermo, the University of Turin and the Universitat de València, Triton Research Srl.

There are also a number of other projects in which ISPRA is involved, aimed at protecting various endangered animal species:

- the **LIFE STREAMS “Salmo cettii Recovery Actions in Mediterranean Streams”** project aims to identify concrete actions for the conservation of the Mediterranean trout (*Salmo cettii*);
- the **LIFE FALKON** project for the conservation of the lesser kestrel in areas located on the northern edge of the central-eastern Mediterranean, with the aim of promoting the northward expansion of the species;
- the **LIFE Perdix** project, which aims to recover and conserve the Italian Partridge (*Perdix perdix italica*), declared extinct in the wild, through genetic analysis, captive breeding and the reintroduction of viable populations within the Natura 2000 site ‘Valle del Mezzano’, Special Protection Area (SPA IT4060008) in the Po Delta;
- the **Wildcat Project** aimed at the creation of an Integrated National Database of the European wildcat species (i.e., Felis DB) to collect all available data on the species in Italy (genetic data, morphometric and phenotypic data, camera trapping and remote sensing data, necropsy and pathogen data, GPS data), combining historical data (such as the database created by Prof. Bernardino Ragni) with current data;
- the **LIFE Egyptian vulture** project, which aims to promote the conservation of the Egyptian vulture, a small vulture that is considered endangered at European level, and in Italy is the bird species most at risk of extinction.

The **SEAFORST LIFE “Posidonia meadows as carbon sinks of the Mediterranean”** project falls within the priority area of climate change mitigation; it was jointly proposed by: D.R.E.Am. Italy; ISPRA; CNR: University of Tuscia, Water Right Foundation; La Maddalena Archipelago National Park; Cilento, Vallo di Diano and Alburni National Park; Asinara National Park; Carbon Sink Group s.r.l. and Paragon Limited (Malta). It concerns the habitat 1120* of Posidonia oceanica meadows, which is proving to be significant in terms of carbon deposits, both in terms of the intensity of carbon sequestration and the capacity of its deposits, whose accumulation has been going on for thousands of years. Despite the

importance of this ecosystem service, also from the point of view of the biodiversity it hosts, this habitat is disappearing at a rate that is four times higher than that of terrestrial forests. The aim of the project is to increase the carbon sink capacity of Posidonia meadows through erosion reduction actions and subsequent consolidation of the 1120* habitat.

The **EUSEAMAP3** (2018-2020) “**Operation, development and maintenance of a European Marine Observation and Data Network – LOT 2 Seabed Habitats**” project aims to create a digital map of European seabed habitats by collecting all existing data in an easily accessible database, carrying out an assessment of the available wave and oceanographic data (temperature, salinity and bottom chemical parameters) on the Mediterranean, Black Sea and Macaronesia, and a specific study to determine the bottom energy due to sea currents based on information on sea state, bathymetry and sedimentology.

The **BBCircle** (**Biomaterials, Biofuels, CO₂ and Circulation. A study on the implementability of biorefineries in the Lazio Region**) project aims at assessing, through a context investigation, an experimental campaign at laboratory scale and a theoretical analysis phase carried out by means of life cycle analysis and circularity indicators, the technical feasibility and environmental performance of electrochemical and thermal systems applied to biodegradable organic waste and scrap. Specific attention will be paid to the reduction of net CO₂ emissions from the various processes constituting the proposed systems, through integration with CO₂ sequestration treatments. The project envisages a collaboration between the University of Rome “La Sapienza” (Lead Partner), the University of Rome “Niccolò Cusano”, the University of Rome “Tor Vergata”, and ISPRA.

Euro-Mediterranean Centre on Climate Change

In 2021, **132 research projects were underway, 227 refereed papers** and **42 datasets** were published, available in detail at this address: www.cmcc.it/publications.

The fields of application of such research and publications have mainly concerned climate forecasting systems, risk analysis systems and environmental monitoring systems.

In particular, CMCC contributed to the sixth IPCC Assessment Report of the Working Group “Climate Change 2021: the Physical Science Basis” by providing state-of-the-art climate simulations using its CMCC-CM2 (CMCC - Climate Model 2) and CMCC-ESM2 (CMCC - Earth System Model 2) models.

European Centre for Medium-Range Weather Forecasts

Listed below are some of the ECMWF's major projects underway in the years 2021 and 2022, into which the proceeds of the issues covered in this Report are allocated.

- **Satellite Application Facility on Support to Operational Hydrology and Water Management (H SAF):** ECMWF contributes to the H SAF basic products for soil moisture (see official H SAF website) and is represented in the H SAF steering group and project team.
- **EIFFEL (Revealing the Role of GEOSS as the Default Digital Portal for Building Climate Change Adaptation & Mitigation Applications):** the project will make it easier for the scientific community to explore and use GEOSS datasets. Value-added services interoperable with GEOSS will be designed, using cognitive search and artificial intelligence-based metadata augmentation tools. In particular, ECMWF will improve the methodology of pilot projects 1 and 5 on a European scale using the Copernicus Emergency Management Service (CEMS) fire (GEFF) and flood (LISFLOOD) risk models. In addition, ECMWF will perform a climate sensitivity analysis of the models using scenario-neutral response surfaces created by forcing data perturbation.

- **DOMOS (Dust-Ocean Modelling & Observing Study):** The project aims to advance the understanding of the interactions between atmospheric dust and the ocean in the context of climate change, through the innovative use of the satellite data collection model (CALIPSO and Aeolus). For this purpose, the CAMS reanalysis the data set developed by the ECMWF's Integrated Forecasting System (IFS) and is used to achieve a better representation of the physical and chemical characteristics of dust deposition on the ocean.
- **I-CHANGE (Individual Change of HABits Needed for Green European transition):** as part of the project, ECMWF will create a repository that will be part of an environmental impact hub (EIH), which can also be used to involve private citizens in making their own data available alongside environmental and climate data.
- **LEXIS:** the project focuses on the development of a large-scale HPC and Cloud BigData analysis platform to develop a high-level software and infrastructure for three pilot uses: (1) Aeronautics (2) Weather and Climate (3) Disaster Warning Systems. ECMWF's role in the project is to design and develop a weather and climate data interface application (WCDA), which will facilitate the exchange of data between the different sources from which they originate.
- The **Highlander** project aims at smarter land management by investigating new and emerging technological areas aimed at reducing risks to human health, agriculture and livestock production. Through the use of the High-Performance Computing, the project aims to reduce the risks associated with climate change by processing data and obtaining accurate climate forecasts for sustainable management of natural resources and land.
- **ESCAPE-2 (Energy-efficient SCalable Algorithms for weather and climate Prediction at Exascale):** ESCAPE-2 will develop world-class extreme-scale computing capabilities for European operational numerical weather and climate prediction systems.
- The **DORSY** project is linked to the EarthCARE mission and was founded by ESA, in collaboration with McGill University (CA), the University of Leicester (UK) and the *Centre National de la Recherche Scientifique-Laboratoire Atmospheres, Milieux, Observations Spatiales* (CNRS-LATMOS, France). ESA's EarthCARE mission aims to advance our understanding of cloud-precipitation-aerosol interactions and contribute to the improvement of their representation in numerical models. In the DORSY project, ECMWF leads the development of the unified synergy algorithmic framework that will utilise observations from all three sensors on board EarthCARE, producing realistic estimates of atmospheric vertical cross sections for a wide range of cloud, aerosol and precipitation conditions.

ITER-DTT nuclear fusion project

The proceeds collected in 2022 from the **BTP Green** issues financed the contribution by the 2021 state budget to the European **ITER** project under the programme managed by Eurofusion (European Consortium of which ENEA is a member) on the new **DTT (Divertor Tokamak Test facility)** infrastructure.

Annex I: Allocation table detail

This section of the document provides more detail on the green expenses reported both:

- in Table 1 on the revision of the allocation of proceeds raised from issuances of sovereign green bonds in 2021 (i.e., **2045 BTP Green**);
- in Table 3 on the allocation of proceeds raised from issuances of sovereign green bonds in 2022 (i.e., **2035 BTP Green**).

For each of two allocations and for each sub-category of eligible expenditures, the tables show:

- the competent Ministry³⁰²;
- the corresponding expenditure chapter of the State budget;
- the description of the expenditure chapter of the State budget;
- the breakdown of eligible expenditures over the two reporting periods (i.e., 2018-2021 and 2019-2022).

Table 14: Chapter details			2018-2021 Allocation (2045 BTP Green)				2019-2022 Allocation (2035 BTP Green)			
Ministry	Chapter	Chapter description	2018	2019	2020	2021	2019	2020	2021	2022
Renewable sources for electricity and heat production										Category 1
MEF	-	Tax benefits for energy from renewable sources	59,600	63,240	54,210	57,850	-	-	-	57,850
Tax benefits for energy efficiency in buildings										Category 2
MEF	-	Tax benefits for energy efficiency in buildings	1,634,200	-	-	-	1,828,900	2,017,700	-	-
Subways										Category 3
MIT	7059	Design/realisation of strategic infrastructure and water resource capture/supply projects	-	-	-	16,077	-	-	-	-
MIT	7060	Strategic infrastructures of primary national interest and capture and adduction of water resources projects	94,478	49,792	102,074	144,411	-	-	-	153,164
MIT	7418	Interventions in favour of the new M4 and M5 metro lines in Milan	-	-	-	-	-	25,000	25,000	40,000
MIT	7421	Resources to be allocated for the construction of the Naples Metro - Line 1, Centro Direzionale-Capodichino section	19,558	-	-	-	4,063	-	21,649	35,373
MIT	7422	Resources to be allocated for the construction of Brescia's automatic light metro bus	2,030	-	-	-	585	-	10,145	8,066
MIT	7423	Fund for under construction subways in metropolitan areas	358	-	-	-	-	1,205	2,174	2,480

³⁰² Ministry of Economy and Finance (**MEF**); Ministry of Infrastructure and Transport (**MIT**); Ministry of Environment and Energy Security (**MASE**); Ministry of Enterprise and *Made in Italy* (**MIMIT**); Ministry of Agriculture, Food Sovereignty and Forests (**MASAF**); Ministry of university and Research (**MUR**). The Table 14 shows the names of the Ministry currently in force.

MIT	7424	Resources to be allocated to the Turin metro	9,835	704	24,446	97,262	-	-	-	5,204
MIT	7427	Resources for the completion of the Naples Metro Line 1	85,500	-	-	-	-	-	-	-
Rail freight transport subsidies										Category 3
MIT	1246	Contributions for intermodal rail transport services in connection with logistics hubs and ports	17,594	35,491	-	32,881	-	-	-	60,697
MIT	1274	Contributions to be paid to railway undertakings for freight transport incentives	4,500	99,905	99,906	199,876	-	-	-	99,900
Interventions for rapid mass transport										Category 3
MASE	8405	Interventions for depollution and improvement of air quality	1,328	8,893	-	-	-	-	-	-
MIT	7060	Strategic infrastructure of overriding national interest, and capture and adduction of water resources projects	-	12,868	-	-	-	-	-	-
MIT	7241	Contributions for the purchase and/or replacement of buses and/or other means of public passenger transport	3,933	3,220	1,840	-	-	-	-	-
MIT	7400	Expenditure for the completion of interventions in the rapid mass transport systems	-	60,135	-	-	-	-	-	-
MIT	7403	Realisation of rapid guided mass transport systems and urban rapid tramways	17,967	13,550	35,980	22,837	-	-	-	-
Expenditures and contributions for railway infrastructure and HS / HC lines										Category 3
MEF	7122	Contributions to FFSS for investments in railway infrastructure development and modernisation	2,083,318	1,073,153	1,110,591	2,017,968	1,053,385	-	-	968,787
MEF	7123	Capital expenditures to be paid to FFSS for specific projects	1,915	1,915	-	-	-	-	-	-
MEF	7124	Contributions to FFSS for interventions on the HS/HC system of the TO-MI-NA lines and traditional network	1,152	1,643	24	-	-	-	-	-
MIT	7060	Strategic projects of primary national interest and the capture and adduction of water resources	91,583	24,307	123,254	24,905	-	-	-	-
MIT	7425	Interventions in favour of the south-eastern railways	747	1,176	-	-	-	-	-	-
MIT	7518	Resources to be allocated to RFI for the HS/HC Milan-Genoa line: third Giovi pass	47,181	197,057	-	-	-	-	-	-
MIT	7532	Resources to be allocated for the construction of the new Turin-Lyon railway line	-	57,908	63,459	-	-	-	156,445	-

MIT	7539	Resources to be allocated to the Valle d'Aosta Region for the Piedmont-Valle d'Aosta rail route	18,900	-	-	2,160	-	-	-	-
MIT	7564	Resources to be allocated for upgrading the Lucca-Pistoia railway line	-	25,990	124,674	28,007	-	-	-	-
Padano-Veneto waterway system										Category 3
MIT	7700	Expenditure for the construction of the Padano-Veneto waterway system	6,421	1,571	1,948	4,149	-	-	-	
Measures to combat marine and inland water pollution										Category 4
MIMIT	3531	Supervision/safety control (also environmental) of offshore hydrocarbon exploration/cultivation installations	11,663	4,106	4,710	4,915	-	-	-	-
MIMIT	3532	Expenditures of the Offshore Safety Committee for the accomplishment of its tasks	3	91	-	11	-	-	-	-
MASE	1409	Expenditures for the compliance/monitoring related to environmental assessments in coastal and marine areas	215	-	-	-	400	-	-	415
MASE	1628	Contribution to the financing of the action plan for the protection of the Mediterranean Sea against pollution	1,707	-	-	-	1,695	2,050	1,633	1,738
MASE	1644	Expenditures for the marine environment protection service	35,884	27,420	36,985	40,673	-	-	-	48,946
MASE	1655	Financial support for surveillance and control activities in the marine and coastal environment carried out by harbour master's offices	-	-	-	-	-	-	-	2,961
MASE	1823	Implementation of the convention between Italy and Switzerland for the protection of waters against pollution	436	-	-	-	430	430	430	431
Plan for environmental recovery and integrated waste cycle										Category 4
MASE	4116	Supervision and control activities in the field of integrated waste management	-	-	-	-	148	568	1,320	1,280
MASE	7090	Fund allocated to the experimental programme "Mangiaplastica"	-	-	-	-	-	-	-	6,290
MASE	7503	Expenditure on land reclamation and waste management	4,866	6,175	59,942	43,504	-	-	-	-
MASE	7509	Urgent measures of perimeter and safety, remediation, de-pollution, and environmental restoration	20,093	-	-	-	12,108	18,126	6,671	3,752
MASE	7510	Reduction/prevention of waste generation and development of new recycling and disposal technologies	7,457	-	-	-	3,736	4,578	7,779	4,543

MASE	7515	Clean-up and safety measures for SINs to ensure the proper fulfilment of European obligations	5,000	-	-	-	-	14,000	21,225	33,073
MASE	7518	Fund for the preliminary and final design of remediation of asbestos-contaminated buildings	654	-	-	-	332	59	101	168

Water purification interventions

Category 4

MASE	7503	Expenditure on land reclamation and waste management	-	1,214	3,290	-	-	-	-	-
MASE	7645	Expenditure on land reclamation and waste management	7,932	6,613	13,735	6,126	-	-	-	-
MASE	7648	Expenditure on financing interventions in the water purification sector	46,738	20,597	32,200	4,110	-	-	-	-
MIT	7253	Project fund: resources for the completion of the integrated water system in the Abruzzo region	721	3,036	-	-	-	-	-	-
MIT	7281	Extraordinary reservoirs plan	-	43,777	-	-	-	-	-	-

Measure to combat air and soil pollution

Category 4

MASE	2647	Prevention of major accident hazards associated with certain industrial activities	-	-	-	-	-	163	103	374
MASE	2705	Studies and inspections relating to the verification and release of environmental assessments and authorisations	7,146	-	-	-	8,215	6,454	-	-
MASE	2793	Contributi a ISPRA per attuazione del Regolamento Reach, concernente le sostanze chimiche	489	-	-	-	497	-	-	-
MASE	2794	Contributions to ISPRA for implementation of the REACH regulation on chemicals	-	-	-	-	-	497	497	497
MASE	8405	Interventions for depollution and improvement of air quality	1,367	15	-	-	-	-	-	-

International agreements to combat pollution and climate change

Category 4

MASE	1871	Controllo dei movimenti transfrontalieri di scorie tossiche e della loro eliminazione	239	-	-	-	103	175	191	201
MASE	1872	Chemical-physical and radioactive pollution monitoring activities in Balkan countries	-	-	-	-	-	-	267	-
MASE	2220	Expenditures for the implementation of international agreements related to climate change	-	-	-	-	-	3,601	3,776	4,017

MASE	2225	European long-range transport of air pollutants monitoring and evaluation programme (EMEP)	198	-	-	-	210	200	184	215
MO.S.E. and safeguarding of the Venetian lagoon										Category 5
MIT	7059	Design/construction of strategic projects related to the capture/supply of water resources	-	-	-	133	-	-	-	-
MIT	7060	Strategic works of pre-eminent national interest and the capture and adduction of water resources	-	-	-	4,653	-	-	-	48,299
MIT	7187	Fifteen-yearly annuities for the updating of studies on the Venice Lagoon	4,161	1,968	916	1,916	-	-	-	5,812
MIT	7200	Expenditure for the implementation of the MO.S.E. system	192,655	34,209	55,942	47,242	-	-	-	93,325
MIT	7403	Realisation of rapid guided mass transport systems and urban rapid tramways	16,393	1,522	-	-	-	-	-	-
Water infrastructures										Category 5
MASE	3010	Resources allocated to district basin authorities	-	-	-	-	-	18,555	21,871	21,871
MASE	3022	Resources to be allocated to river basin authorities for enhancement and monitoring of environmental and river assets	6,000	-	-	-	8,000	7,000	2,500	9,000
MASE	7645	Expenditures on land reclamation and waste management	7,932	6,613	13,735	6,126	-	-	-	-
MIT	7012	Expenditure on projects and structural measures to secure the Gran Sasso and catchment systems	-	20,000	-	100,000	-	-	-	-
MIT	7059	Designing/constructing strategic and water resource capture/supply projects	-	-	-	705	-	-	-	-
MIT	7060	Strategic projects of pre-eminent national interest and water catchment and adduction projects	35,426	6,559	6,809	1,952	-	-	-	562
MIT	7253	Project fund: resources for the completion of the integrated water system in the Abruzzo region	721	3,036	-	-	-	-	-	-
MIT	7280	Resources for investments in dams	1,003	-	-	-	286	1,045	996	1,019
MIT	7281	Extraordinary reservoirs plan	-	43,777	-	-	-	-	-	-
MIT	7403	Realisation of rapid guided mass transport systems and urban rapid tramways	14,851	12,508	-	1,101	-	-	-	-
MASAF	7438	Amounts for the start-up of projects foreseen in the national irrigation plan	5,485	10,559	-	-	-	-	-	-
MASAF	7470	Investments for national infrastructure development	658	11,508	16,660	48,508	-	-	-	43,433

MASAF	7471	Extraordinary maintenance/upgrading of subsidence protection works	-	6,000	-	-	-	-	-	-
Protected Marine Areas, National Parks and State Nature Reserves										Category 5
MASE	1391	National centre for confiscated animals	-	-	-	-	-	-	-	6,000
MASE	1392	Wildlife recovery fund	-	-	-	-	-	-	1,000	-
MASE	1393	Fund for the control of invasive exotic species	-	-	-	-	-	-	-	5,000
MASE	1551	Resources to be disbursed to bodies, institutes, associations, foundations, and other organisations	73,171	71,033	66,309	-	-	-	78,998	74,681
MASE	1646	Expenditures on the management of marine reserves and their promotion	5,524	-	-	-	3,737	4,426	7,415	7,446
MASE	1648	Underwater museum parks located in the waters of Baia in the Gulf of Pozzuoli and Gaiola in the Gulf of Naples	-	-	-	-	207	147	147	147
MASE	7217	Interventions for the establishment, promotion and operation of national parks	1,237	1,132	3,883	-	-	-	23,923	24,733
MASE	7219	Contributions and transfers to national parks	2,162	1,695	1,801	-	-	-	1,695	1,695
MASE	7221	Demolition of unauthorised structures in national protected areas	-	-	-	-	151	151	151	151
MASE	7222	Investments for fauna/flora conservation, biodiversity protection and the marine ecosystem	35	2,492	875	-	-	-	3,123	1,856
MASE	7223	Financing of activities under the three-year programme for protected natural areas	-	-	-	-	7,354	74,479	76,941	936
MASE	7311	Interventions for the promotion and establishment of marine protected areas	1,190	-	-	421	2,996	2,364	443	494
Soil protection and interventions against hydrogeological instability										Category 5
MASE	7511	Interventions to secure the territory against hydrogeological instability	98,643	139,111	47,429	-	-	-	-	51,560
MASE	8533	Environmental protection fund and urgent soil protection measures in hydrogeological risk areas	39,187	8,931	-	-	-	-	-	-
MASE	8535	Resources for financing hydrogeological risk mitigation interventions	5,609	54,961	28,239	-	-	-	-	3,654
MASE	8551	Interventions for soil improvement and for the most urgent needs in the event of public disasters	21,468	-	10,387	-	-	-	-	-
MASE	8582	Expenditure for public disaster relief	471	-	915	-	-	-	-	-
MASE	8631	Expenditure on soil protection measures	1,283	9	-	-	-	-	-	-

Environmental protection, certification and protection of biodiversity										Category 5
MASE	1388	Trading and possession of animals and plants threatened with extinction and expenditure on projects for the protection of endangered species	312	-	-	-	655	410	500	293
MASE	2041	Operating expenses Ecolabel and Ecoaudit Committee and other environmental certification activities	307	-	-	-	220	222	213	163
MASAF	2082	Certification activities of seed propagation material and valorisation of plant varieties	121	-	-	-	75	59	49	26
MASAF	8002	Resources to be allocated for the protection and preservation of monumental trees	-	-	-	-	-	321	43	78
MASAF	8010	Italian forest fund	-	-	-	-	-	2,360	5,476	5,865
International cooperation for environmental protection										Category 5
MIMIT	2331	Italy's contribution to the Union for the Protection of Plant Varieties (UPOV) in Geneva	92	-	-	-	95	100	99	102
MASE	1556	Expenditure for the financing of the experimental "green helmets for the environment" programme	-	-	-	-	-	1,115	240	1,115
MASE	1618	Expenditure on international agreements, bodies and conventions	2,413	-	-	-	3,223	3,522	3,630	2,771
MASE	1619	Conservation agreement for cetaceans of the Black Sea, Mediterranean and Atlantic Area	293	-	-	-	296	265	196	306
MASE	8412	Contribution to the Green Climate Fund in implementation of the Paris Agreement	50,000	-	-	-	-	33,000	33,000	33,000
Contribution to the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)										Category 6
MIMIT	7630	Contribution to the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)	209,789	151,587	141,181	141,231	-	-	-	-
MIMIT	7660	Implementation of projects aimed at promoting and improving energy efficiency	1,345	62,438	-	312,096	-	-	-	-
Contribution to the Euro-Mediterranean Centre on Climate Change (CMCC)										Category 6
MUR	7239	Contribution to the Euro-Mediterranean Centre on Climate Change (CMCC)	5,000	5,000	5,000	-	-	-	7,000	7,000
Contribution to European centre for medium-term weather forecasts (ECMWF)										Category 6
MUR	7291	Convention establishing the European centre for medium-term weather forecasts (ECMWF)	5,227	5,741	6,037	-	-	-	5,720	6,516

MUR	7296	State contribution to the ECMWF concerning the centre's premises in Italy	-	-	-	-	2,115	-	-	-
Support for scientific and technological research in the Arctic and Antarctic										Category 6
MUR	1701	Participation in international organisations for scientific and technological research programmes in Antarctica	-	-	-	-	-	-	18	20
MUR	7335	Arctic research programme fund	-	1,000	-	-	-	1,000	1,000	-
MUR	7636	Contribution to OGS for the purchase of a ship as scientific research infrastructure to support the Antarctic Base	12,000	-	2,000	-	-	-	-	-
ITER-DDT nuclear fusion project										Category 6
MIMIT	7640	Resources for the ITER-DDT nuclear fusion project	-	-	10,000	-	-	-	10,000	-
Sustainable development, pollution prevention and reduction										Category 6
MASE	2218	Expenditure on the Implementation of international agreements on air pollution	230	-	-	-	200	200	60	162
MASE	2219	International conventions and cooperation activities with international organisations on air pollution	146	-	-	-	59	273	441	413
MASE	4131	Studi, ricerche, elaborazione dati per la prevenzione e la riduzione dell'inquinamento	-	-	-	-	154	-	-	-
MASE	7953	Fund for stimulating measures to promote sustainable development	3,078	10,278	4,695	9,763	-	-	-	-
Contribution to CNR-IRBIM: Anton Dohrn Zoological Station of Naples										Category 6
MUR	7337	Research in southern Italy for CNR-IRBIM (Anton Dohrn zoological station in Naples)	-	2,000	-	-	-	-	-	-
Contributions to the Institute for Environmental Protection and Research (ISPRA)										Category 6
MASE	3621	Contributions to the Institute for Environmental Protection and Research (ISPRA)	70,363	-	-	-	71,518	-	-	-
MASE	3622	Contributions to the Institute for Environmental Protection and Research (ISPRA)	-	-	-	-	-	74,273	75,273	76,280
MASE	8831	Contributions to the Institute for Environmental Protection and Research (ISPRA)	19,848	-	-	-	19,848	-	-	-
MASE	8832	Contributions to the Institute for Environmental Protection and Research (ISPRA)	-	-	-	-	-	19,848	19,848	-
Contribution to the Council for Agricultural Research and Analysis of the Agricultural Economy (CREA) and to the Institute for the Agricultural Food Market (ISMEA)										Category 6

MASAF	1501	Transfers to research bodies and institutes	-	-	-	-	915	8	310	351
MASAF	1502	Expenditure on national implementation activities of the international treaty on plant genetic resources for food and agriculture	-	-	-	-	2,030	920	5,311	876
MASAF	2089	Contribution to ISMEA and/or CREA for studies, research and support activities in the field of agricultural cooperation	-	-	-	-	199	376	271	188

Note: values expressed in EUR thousand.

Annex II: Methodological note on the NACE classification of green expenditure and eligibility assessment for the EU Taxonomy

This Report includes a specific section to assess whether the expenditures allocated in the four-year period 2019-2022 are included among the eco-sustainable activities according to the **EU Taxonomy**, pursuant to the EU Regulation 2020/852 and subsequent delegated acts.

In fact, the European Commission has envisaged a gradual implementation of the sustainable finance regulation, including:

- a **simplified first phase**, in which to identify the percentages of activities included in the list of «**relevant**» economic activities according to the EU Taxonomy, i.e. **potentially environmentally sustainable activities**;
- a **subsequent phase**, when fully operational, in which the sustainable activities are defined as «**aligned**», i.e. they are not only included in the list of **potentially environmentally sustainable economic activities** but also:
 1. **contributing significantly** to the achievement of at least one of the six environmental objectives³⁰³, in particular through *i)* the reduction of pressures on the environment (production of a low environmental impact linked to a high potential for substitution of more impactful activities, e.g., renewables), *ii)* the improvement of the environment state (e.g. remediation), or *iii)* the enabling of other environmentally sustainable activities (e.g. hydrogen research and development);
 2. **do not produce significant negative impacts** on any environmental objective, in a Life Cycle Assessment (LCA) perspective that considers the impacts generated by an economic activity all along its life cycle (DNSH principle);
 3. are carried out in compliance with the **minimum social safeguards** (pursuant to Art. 18 of EU Regulation 2020/852), such as those set out in the OECD Guidelines and UN documents on business and human rights.

In line with the gradual application approach adopted by the European Commission, this Report provides an assessment of the «**relevance**» of the country's green **transition expenditures** allocated according to the EU Taxonomy. It therefore assesses, without any further in-depth technical analysis, whether the items of the State budget considered for the purposes of allocating the proceeds raised by issuing **BTP Green** are attributable to **economic activities considered potentially eco-sustainable**, insofar as capable of contributing to achieving the objectives of the European *Green Deal*.

At the time of drafting the Report, only the technical screening criteria referring to the first two objectives of the EU Taxonomy³⁰⁴ (1. *climate change mitigation*, 2. *climate change adaptation*) were published in the context of the 2021 *Climate Delegated Acts*³⁰⁵. Therefore, for the allocated items of the State budget the following steps were taken:

³⁰³ According to Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 establishing a framework for supporting sustainable investment and amending Regulation (EU) 2019/2088, Recital No. (23) the environmental objectives are: 1. Climate change mitigation; 2. Climate change adaptation; 3. The sustainable use and protection of water and marine resources; 4. The transition to a circular economy; 5. Pollution prevention and control; 6. The protection and restoration of biodiversity and ecosystems.

³⁰⁴ For the remaining four objectives, no Delegated Act has been published. The Environmental Delegated Act, expected by 2023, will contain methodological indications and recommendations on the criteria associated with the remaining four environmental objectives (3. pollution control, 4. use and protection of water and marine resources, 5. circular economy, 6. protection and restoration of biodiversity and ecosystems). The draft Regulation has been made available on the Sustainable Finance Platform for public consultation: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13237-Investimenti-sostenibili-tassonomia-ambientale-dell'UE_it.

³⁰⁵ The Delegated Act was published in the Official Journal of the EU on 9 December 2021, through the EU Delegated Regulation No. 2139/2021 in force as of 1 January 2022. It includes the sectors responsible for the largest contribution to CO₂ emissions - i.e. the energy,

- a. an accurate **assessment of the «relevance»** of expenditure items with respect to the first 2 objectives of the EU Taxonomy, performed mainly on the basis of the definition of «**Taxonomy relevant**» sectors and economic activities identified in the **Taxonomy compass** of European Commission³⁰⁶ ;
- b. an **extension of the assessment of the expenditure items** with respect to all the objectives of the EU Taxonomy by making explicit, for homogeneous macro-categories of expenditure, the possible connection not only with objectives 1 and 2 but also with objectives 3-6 (3. *Sustainable use and protection of water and marine resources*, 4. *Transition towards a circular economy*, 5. *Pollution prevention and control* and 6. *Protection and restoration of biodiversity and ecosystems*). This exercise has taken into account the proposed amendment to the *Delegated Climate Act*, published by the European Commission in April 2023, and the related technical screening criteria referring to these objectives³⁰⁷ (although not yet in force), as well as on the basis of relevant reports and research.

a. **Evaluation of «relevance» of allocated expenditure items (environmental objectives 1 and 2)**

The accurate assessment of the «relevance» of the allocated expenditures with respect to eco-sustainable activities according to the EU Taxonomy, following the methodologies developed by the European Commission's Directorate General for Financial Stability, Financial Services and the Capital Markets Union (FISMA), is based on the **NACE** (*Nomenclature statistique des activités économiques dans la Communauté européenne*) classification of economic activities, i.e. the system developed by the European Union to standardise the definitions of economic-industrial activities.

In order to assess the compliance of all allocated green expenditures with respect to potentially environmentally sustainable economic activities for the purposes of the EU Taxonomy, starting from the State budget items, a **multi-level approach** has been developed, summarised in the following steps:

1. evaluation of each allocated expenditure item of State budget on the basis of the corresponding mission, programme, centre of responsibility, action and management plan, as well as on the basis of its association with the *International Classification of Government Expenditure by Function* (COFOG)³⁰⁸;
2. identification, with the help of the correspondence tables defined by the United Nations, of the associations between COFOG and the *International Standard Industrial Classification – ISIC* (Rev. 3.1 and Rev. 4)³⁰⁹;
3. association and calibration of allocated expenditure items with the European Classification of Economic Activities codification (NACE Rev. 2);
4. assessment of the relevance of each allocated expenditure item for the purposes of the EU Taxonomy, i.e., its traceability within one of the economic sectors and activities considered

manufacturing, transport and construction sectors - as well as the activities that can support their transformation. See: <https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=OJ:L:2021:442:FULL&from=EN>. It should be noted that, in February 2022, the European Commission approved a complementary delegated act to the *Climate Delegated Act*, the so-called *Complementary Delegated Act*, through which it was proposed to extend the list of transitional economic activities (Art. 10, par. 2 of Reg. 2020/852) by including certain activities associated with the use of natural gas and nuclear energy that were initially excluded.

³⁰⁶ See the tables in the annex to this note for each of the climate objectives.

³⁰⁷ European Commission's amendment proposal entitled '*amending Delegated Regulation (EU) 2021/2139 as regards additional technical screening criteria for determining the conditions under which certain economic activities qualify as contributing substantially to climate change mitigation or climate change adaptation and for determining whether those activities cause no significant harm to any of the other environmental objectives*'.

³⁰⁸ In the case of items in the state budget that affect several interventions, which can be attributed to different public expenditure functions, the same chapter has been classified as many times as the functions concerned (COFOG), and the relevant sums have been apportioned.

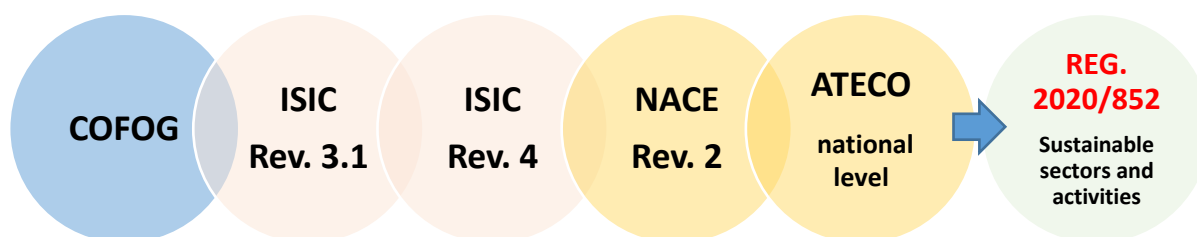
³⁰⁹ In some cases, only part of the COFOG can be used for this connection.

potentially environmentally sustainable, according to the *Taxonomy Compass* developed by the European Commission.

In some cases, the transition between the different classifications has required discretionary assessments due to the **different purposes for which each classification has been defined**. This is particularly evident when one considers the heterogeneity and specificity of the expenditures that characterise a State budget, which cannot always be associated (summarised) in ordinary classifications of economic activities.

Specifically, it seems appropriate to emphasise that the NACE Rev. 2 classification, although aligned with ISIC Rev. 4, pays more attention to the process characterising the specific production phases, aggregating each activity on the basis of the production technologies used. Activities that have a common process for producing goods or services fall into the same category. In addition, the fourth level of NACE Rev. 2 classification (*4 digits*), in order to take into account the characteristics of the economic structure in European countries³¹⁰, has a larger number of classes than the United Nations International Standard Industrial Classification of All Economic Activities (ISIC Rev. 4). Similarly, COFOG presents a more detailed list than ISIC in the definition of expenditure functions to take into account the range and diversity of government activities.

Figure 56: Relationship between the different classification tables



Source: UN

For these reasons, while starting from the association by means of official conversion tables, the reclassification according to NACE classes has been carried out on the basis of a **punctual analysis for each allocated expenditure item of the state budget**, with the aim of eliminating possible discrepancies and identifying the most relevant *de facto* economic destination where an unambiguous reconciliation was not possible³¹¹.

Specifically, both the detailed information on investments reported within the public accounts reported by the State General Accounting Office, and the **qualitative and quantitative information** shared by the competent Ministries for each budget chapter within special Information Sheets collected within the

³¹⁰ Up to the economic activity class level (*4 digits*), Italian economic activities classified by Ateco 2007 coincide uniquely with those of NACE Rev. 2.

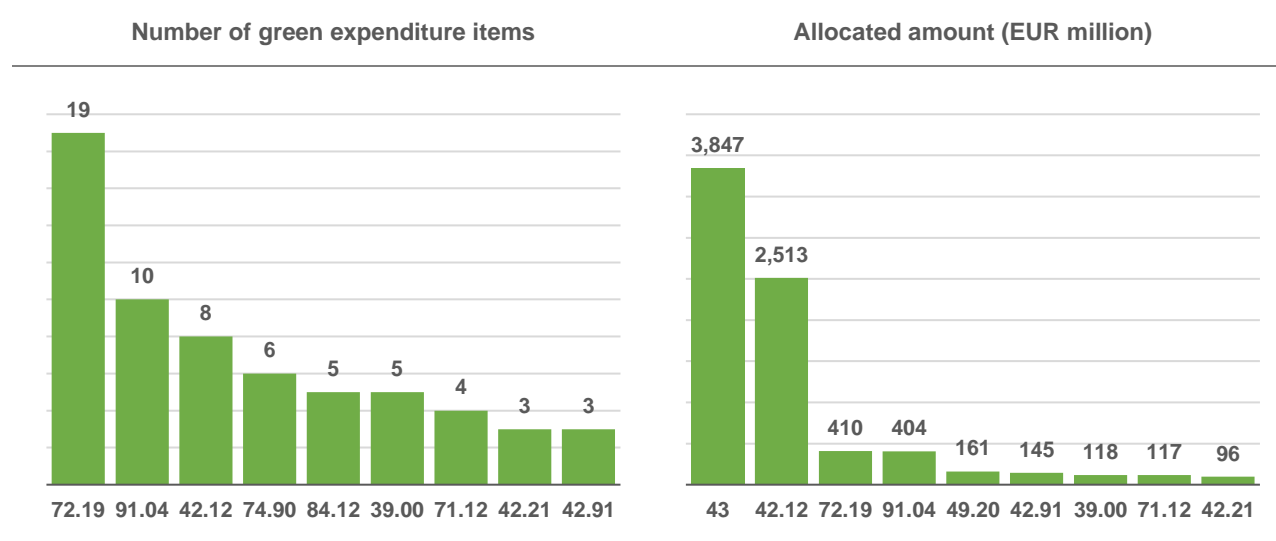
³¹¹ In the presence of expenditure from the state budget that involved several types of economic activities, within the same investment, these were classified according to the principle of prevalence.

Interministerial Committee for Green Government Bonds³¹² have been examined in detail for each expenditure item.

At the same time, the homogeneity of the reconciliation for similar expenditure items, in terms of earmarking and programme, was checked to ensure the methodological consistency of the classification.

The calibration procedure of the available information allowed the **reconciliation of all green expenditures allocated** within a plurality of economic activities according to the *2-digit* NACE classification (Figure 57).

Figure 57: Green expenditure allocated to the main NACEs (2-digit)*
(2019–2022)



* Only NACE codes for which at least three allocated expenditure items are observed are shown in the graph.

Source: Elaboration on MEF data.

The NACE codes³¹³ that are most present following the reclassification are *72.19 – Other research and experimental development activities in the field of natural sciences and engineering*, *91.04 – Activities of botanical gardens, zoos and nature reserves*, and *42.12 – Construction of railway and metro lines*; such codes, on a cumulative level, account for about 78% of the total number of expenditures. However, in terms of allocated mass, the most representative NACE codes are *43 – Specialised construction work* (related to the measure of energy efficiency of buildings) and *42.12 – Construction of railway and metro lines*, which, at cumulative level, weigh about 78.5% of the total amount allocated.

Once the economic activities affected by the various measures had been identified according to the principle of prevalence, the next step was to **assess their eligibility for the EU Taxonomy**³¹⁴ on the basis of the definition of **Taxonomy Relevant** sectors and economic activities identified in the **Taxonomy**

³¹² The Inter-Ministerial Committee for the Monitoring and Publication of Information Required for the Issuance of *Green Government Bonds*, established by a special Prime Ministerial Decree of 9 October 2020, has enabled the activation of a system for sharing information (both qualitative and quantitative) on the expenditure chapters of the state budget considered for the purposes of allocating the proceeds collected from green government bond issues.

³¹³ See Annex 1 for details of all surveyed activities.

³¹⁴ However, there are also activities in the EU Taxonomy that are considered potentially environmentally sustainable for which it is not possible to define a specific assignment to a NACE category (this is the case, for example, of activities related to the environmental protection and restoration of wetlands). For a better understanding of the activities in the EU Taxonomy, set out in Annex I of EU Regulation 852/2020, please refer to the Tables in the Annex to this methodological note for the environmental objectives of climate change mitigation and adaptation.

Compass of the European Commission (see the tables in the annex to this note for each of the climate objectives).

Through this step, out of the **80 expenditure items allocated**³¹⁵, amounting to **EUR 8.1 billion**, it has been possible to assess the initiatives that – according to the classification expressed in the EU Taxonomy – are **potentially eco-sustainable activities with respect to the first two objectives of climate change mitigation and adaptation**, i.e., are potentially able to contribute substantially:

- stabilising greenhouse gas emissions by avoiding or reducing them or enhancing CO₂ absorption, with a view to pursuing the long-term temperature target of the Paris Agreement³¹⁶;
- reducing the risk of adverse effects of the current and expected climate on economic activity, people, nature or assets.

In terms of expenditure items, 65% of the total 80 fall under potentially environmentally sustainable activities according to objectives 1 and 2 of the Taxonomy. At the same time, considering the amount allocated, this percentage rises to **97% with EUR 7.8 billion of potentially environmentally sustainable interventions according to objectives 1 and 2 of the Taxonomy out of the total EUR 8.1 billion allocated**.

b. Evaluation of «relevance» of allocated expenditure items (environmental objectives 3, 4, 5 e 6)

The assessment of the «relevance» of the allocated expenditure items with respect to objectives 3, 4, 5 and 6 of the EU Taxonomy (3. *sustainable use and protection of water and marine resources*, 4. *transition to a circular economy*, 5. *prevention and reduction of pollution* and 6. *protection and restoration of biodiversity and ecosystems*) has been conducted by analogy with the multilevel approach used for the first two environmental objectives (as already detailed in the previous paragraph). In particular, replicating the logic of operation of the *Taxonomy Compass*, the exercise has been based on the first list of potentially eco-sustainable sectors and activities (with relative NACE classification) and on the technical screening criteria identified in the proposal for the Environment Delegated Act to the EU Taxonomy Regulation, published by the European Commission in April 2023, as well as on reports and research on the subject.







In this regard, in order to represent the **potentially eco-sustainable activities considered in the allocation with respect to all 6 objectives of the EU Taxonomy**, the 80 allocated items have been grouped into **7 macro-categories** on the basis of the pre-eminent environmental purpose pursued. This classification of the expenditure items into homogeneous environmental macro-categories, transversal with respect to the categories developed in the **GBF**, allows for a better explanation of the possible connection with the EU Taxonomy objectives (Table 15).

It should be noted that **each allocated expenditure item can be linked to one or more of the objectives of the EU Taxonomy**. For example, as shown in Table 15, of the 10 expenditure items belonging to the research macro-category: 9 items are linked to objective 1 (*mitigation*); 7 items to objective 2 (*adaptation*); 1 item to objective 4 (*circular economy*); 7 items to objective 5 (*pollution prevention and control*) and 3 items to objective 6 (*biodiversity*).

³¹⁵ It should be noted that in the allocation of the proceeds raised from green government bond issues in 2022, 76 expenditure chapters of the State budget were considered. However, for some chapters, in view of the allocation of expenditure therein, the chapter was divided into separate purposes. It should be noted that for the production of energy from renewable sources and energy efficiency measures in buildings, although it is not possible to identify specific expenditure chapters within the State budget, since they are financed through incentive mechanisms, the assessment was also carried out. For these reasons, the total expenditure items considered for the evaluation are 80.

³¹⁶ Entered into force on 4 November 2016 and ratified by all EU countries. The Paris Agreement defines the action plan to combat global warming.

Table 15: Classification of allocated assets by macro-category

Macro-category	Amount Allocated	%	No. Items	Number of expenditure items per objective EU Taxonomy*					
									
<i>Climate change mitigation and adaptation (relevance to objectives 1 and 2 only)</i>	6,783,771	83.7%	23	19	22	-	-	-	-
<i>Interventions for the defence of the city of Venice and its lagoon (MO.S.E.)</i>	147,436	1.8%	3	3	3	3	-	-	3
<i>Sustainable use and protection of water resources</i>	136,137	1.7%	5	5	5	5	-	-	-
<i>Pollution prevention and control, integrated waste cycle and circular economy</i>	157,972	1.9%	11	5	3	-	3	10	-
<i>Protecting biodiversity and the health of eco-systems</i>	430,419	5.3%	16	11	11	5	-	1	8
<i>International cooperation (combating climate change and environmental protection)</i>	79,163	1.0%	12	3	1	5	-	7	1
<i>Research</i>	370,602	4.6%	10	9	7	-	1	7	3
Total	8,105,500	100%	80	55	52	18	4	25	15

Source: Elaboration on MEF data. **Notes:** values expressed in EUR thousand.

(*) Each potentially environmentally sustainable activity can be linked to one or more of the objectives of the EU Taxonomy.

Following this approach, in the macro-categories referring to **international cooperation on combating climate change and environmental protection** and **research** are included: the contributions to international cooperation on biodiversity (e.g., ACCOBAMS agreement, AEWA agreement, etc.) and environmental protection (e.g., *European Plastic Pact*, *EMEP Protocol*, etc.); investments to finance ISPRA; contributions to ISMEA and to CREA.

Expenditure items included in the macro-category of **climate change mitigation and adaptation**, but also pertaining to this area, must also be considered in this group, such as: funding for the Euro-Mediterranean Centre for Climate Change; expenditure required for weather forecasts (see contributions to the ECMWF); contributions to scientific and technological research programmes in the Arctic and Antarctic; and contributions to the ITER-DTT nuclear fusion project.

For nuclear power, for example, from a *Life Cycle Assessment* perspective, which calculates the climate-changing emissions of a production chain from the extraction of the raw material in the quarry to the final disposal of the products, the emissions can be considered equivalent to those of wind and photovoltaics

and thus the reduction is substantial compared to coal, oil and gas. In this sense, in February 2022, the Commission presented a complementary climate delegated act to the EU Taxonomy (published in the O.J. on 15 July 2022 and entered into force on 1 January 2023), which includes certain nuclear activities, meeting nuclear and environmental safety requirements, with the aim of accelerating decarbonisation.

In the case of projects linked to capturing CO₂, on the other hand, the activity has the potential to reduce emissions, even if at present the technologies used do not give satisfactory results in terms of net balance in energy use (again from a *Life Cycle Assessment* perspective) and cost-effectiveness, with the exception of some partial and experimental uses of combined production cycles where emissions are captured to produce carbon dioxide used in greenhouses³¹⁷. In the near future, research in this field could make it possible to move from the experimental phase to the implementation phase with the hope (which for now does not seem within reach) of one day being able to capture CO₂ in the atmosphere in such a way as to affect not only the flow but also the *stock* of climate-changing emissions.

A subset of this first type of interventions relates to the expenditures of exploring and carrying out activities in the Arctic or Antarctic, key locations where the effects of climate change due to the effects of global warming on melting ice and rising sea levels can be monitored.

Similarly, the contributions to ISMEA concerns information and innovation in the agricultural sector. The latter appears today to be mainly focused, given the emergence of global warming, on mitigation activities as the increase in temperatures produces its first effects on national agricultural production (rice, vegetables and fruit) that must change and adapt to the new situation (e.g. by economising on the use of water and modifying sowing, cultivation and harvesting locations and times, as well as developing species more capable of adapting to climate change).

In the above-mentioned cases, public expenditure is mainly aimed at financing the core activity of collecting climate variables per geographical unit (particulate matter and other air quality pollutants, water quality and pollution, atmospheric precipitation, etc.) which represent the basic information infrastructure for monitoring the dynamics of some of the most relevant dimensions of the EU Taxonomy and for research on environmental sustainability and mitigation of climate change emissions. In this respect, a key infrastructure is the *Copernicus* satellite observation programme³¹⁸, financed under the contributions to the ECMWF, which has become the official source of data for measuring climate change.

Due to the fact that the collection, processing and preservation of key climate variables, advanced and applied climate research, and scientific and technical production on environmental issues are a **necessary public good** for designing and testing innovations in sustainability policies, expenditures in this area (international cooperation and research activities) can be considered **relevant to all six objectives of the EU Taxonomy**, although their overall impact is by definition not verifiable, but can provide raw material for future positive environmental sustainability outcomes.

A second homogeneous group of expenditure items included in the macro-category of **climate change mitigation and adaptation** concerns the **investments in sustainable transport and mobility**. In this respect, the focus is the reduction of pollutant and climate-changing emissions related to initiatives and investments aimed at **supporting modal shifts** towards more sustainable transport systems. All expenditures allocated to railway network (such as the upgrading, maintenance and electrification of the infrastructure), as well as the measures to support passenger or freight rail transport (such as the STFM *measure* and the “Ferrobonus” measure) are part of this strand. Similarly, the **investments in subways** reduce the use of private cars and, in general, road mobility by favouring public transport with favourable

³¹⁷ Ghiat, I., Mahmood, F., Govindan, R. and Al-Ansari, T., 2021. CO₂ utilisation in agricultural greenhouses: A novel 'plant to plant' approach driven by bioenergy with carbon capture systems within the energy, water and food Nexus. *Energy Conversion and Management*, 228, p.113668.

³¹⁸ <https://www.copernicus.eu/en>

impacts on **climate change mitigation** (objective 1). At the same time, the investments in safety and resilience of transport infrastructures contribute to **climate change adaptation** (objective 2).

A third group of expenditure items falling under the macro-category of **climate change mitigation and adaptation**. It refers to energy transition and sustainable building initiatives, such as **tax incentives for electricity production from renewable sources** and the **tax incentives for the energy efficiency of buildings** (i.e., *Ecobonus* measure). Both items are considered relevant to objectives 1 (**mitigation**) and 2 (**adaptation**) of the EU Taxonomy.

Another macro-category concerns the **sustainable use and protection of water resources** whose expenditure items are considered **relevant to the first 3 objectives** of the EU Taxonomy.

Although Italy is traditionally a country rich in fresh water, it is facing growing problems on this front, due to the typical effects of global warming, such as the reduction of precipitation, its concentration in shorter and more intense meteorological phenomena, as well as the increase in evaporation and evapotranspiration, caused by higher temperatures in conditions of shortage and backwardness of water infrastructure³¹⁹. From this point of view, very important are the expenditures related to the improvement and enhancement of the national water infrastructure (i.e., aqueduct network, sewer systems) for the distribution of irrigation and drinking water and the resources allocated to the basin authorities for the performance of the functions of environmental and river asset enhancement, environmental monitoring, and flood and low-flow forecasting and management through reservoirs³²⁰.

Interventions in this area are of course relevant to objective 3 (*sustainable use and protection of water and marine resources*), as they are environmentally sustainable activities for the purposes of objectives 1 (*mitigation*) and 2 (*adaptation*) of the EU Taxonomy. This includes investments in river basin authorities that have to deal with another undesirable consequence of global warming: salinisation of river mouths as a result of rising sea levels, which also reduces the availability of fresh water for agricultural crops in those areas.

A further macro-category concerns **pollution prevention and control, integrated waste cycle and circular economy**. This category includes environmental recovery interventions (e.g., asbestos abatement and decontamination interventions, safety and reclamation interventions in areas included in SINs and environmental orphan sites), pollution risk prevention initiatives (e.g., monitoring and control of industrial plants in accordance with the SEVESO III Directive, inspections aimed at issuing integrated environmental authorisation AIA-IPPC, implementation of the REACH Regulation on chemicals) that are relevant to **objective 5** of the EU Taxonomy. The other relevant element for this macro-category is the **circularity of the economy (objective 4)**. As is well known, the circular economy is a strategic key for environmental sustainability, which requires a shift from the model based on the creation of the greatest number of goods and services in the smallest unit of time (traditional productivity) to a model of economic value creation that minimise the use of raw materials as much as possible and minimises climate-changing emissions and the negative effects of production on air and soil quality as well as water availability. The implementation of this strategy requires: the growth of reuse, recycling, regeneration of materials as a production *input*; the increase of product durability; the shift to sharing especially for capital consumer goods, so as to increase the rate of capacity utilisation; the optimisation of the waste cycle. The latter can be pursued by minimising the production of undifferentiated waste and abolishing the use of landfills so as to optimise its disposal. Recyclable waste (plastic, paper, organic matter) becomes the

³¹⁹ In Italy, the leakage rate of aqueducts is around 40% (the highest among the EU countries for which we have reliable data). On the other hand, the capacity to retain rainwater is 11%, compared to 40% in Spain (a country with a longer tradition of attention to the problem of water management in drier regions). See: Water economy in Italy. Water target 2040 for water security planning in Italy, edited by E. De Angelis M. Grassi.

³²⁰ An adequate system of well interconnected reservoirs would in fact make it possible to exploit the simultaneous presence of surplus and deficit in different geographical areas. In recent years, this has been the case in Italy, where there is a simultaneous presence of water deficit areas (North-West) and water surplus areas (Centre-South).

second material with which to produce new goods. Circularity therefore pursues the goal of decoupling the creation of economic value from the consumption of natural resources and requires a revolution in the definition of indicators, monitoring of the impact of projects and the profile of skills, as it necessarily requires the construction of indices that combine measures of value production with measures of consumption of natural resources. The investments on improving the waste cycle (such as the experimental programme “*Mangiaplastica*”) therefore necessarily fall under **objective 4** of the **circular economy**.

Also the expenditures for **labels and certification procedures** (e.g. Ecolabel funded under this allocation) can be matched to the **objective 4** of the EU Taxonomy. They are linked to the issue of quality information on the environmental sustainability of the product or process and the consequent reduction of information asymmetries between businesses and consumers, thus encouraging businesses to generate less waste during the production process and to develop products that are more durable and easier to recycle. Environmental sustainability in the literature is clearly not an “*experience good*” (i.e., an element for which the asymmetry is eliminated through the consumer's experience of the product). In this case, the intervention of third-party agents (such as, *rating* or certification companies) or labels capable of guaranteeing the environmental standards of the product is necessary. The existence of such green standards and/or certificates allows companies, on the one hand, to increase the returns of environmental sustainability in terms of greater willingness to pay (for green product characteristics) on the part of consumers³²¹ and, on the other hand, to increase the possibility of access to tenders (green public procurement) which – increasingly and in more and more sectors – provide for minimum environmental criteria (CAM) that must be respected in order to participate in the tender. As a result of what has been said, expenditure items related to environmental labels and certifications, reducing the information asymmetry and increasing the environmental sustainability returns of products and companies also with respect to the lower emissivity of manufacturing processes, can also be considered relevant with respect to **objective 1** of **climate change mitigation**.

The macro-category of mitigation and adaptation to climate change also includes specific expenditure items referring to interventions for the **prevention, mitigation and contrast of hydrogeological risk**. Instead, a separate macro-category, as it contributes to several environmental objectives, concerns the **MO.S.E. system** that protects the city of Venice and the lagoon ecosystem. This infrastructure represents a frontier and a benchmark for climate change adaptation policies, linked to the effect that global warming generates on sea levels, threatening cities and coastal areas. The expenditures related to this infrastructure are therefore naturally relevant to **objective 1 and 2** of the EU Taxonomy. At the same time, the infrastructure contributes also to **objective 3** of the EU Taxonomy, related to the protection of water and marine resources, where there is a scientific literature analysing the effect of MO.S.E. **on the ecosystem and biodiversity of the lagoon (objective 6)**. If an indirect and secondary effect of MO.S.E. is to modify the water cycle in the local ecosystem in the absence of intervention, there are currently no studies suggesting significant negative effects of the MO.S.E. on biodiversity. On the other hand, by neutralising the alterations that would occur as a consequence of the marked increase in the number and intensity of recent high-water phenomena, the flexible raising of barriers (which does not entirely block the inflow of seawater, but limits its flow rate), used with increasing frequency, helps to preserve the lagoon's ecosystem.

The last macro-category, called **biodiversity protection and eco-system health**, includes contributions to national parks and forests, state reserves and MPAs, as well as expenditure items aimed at financing measures and initiatives to protect biodiversity (e.g., for the protection of monumental trees). As is well

³²¹ In the *World Economic Forum's Future of Job Report 2023* (WEF, *Future of Job Report 2023*), 67 per cent of the companies indicated that the increased consumer demand for environmental sustainability features in products (ranked sixth in the overall ranking, with the need for companies to advance in ESG standards and thus in their overall social and environmental sustainability profile in second place) is a phenomenon that will grow strongly in the coming years.

known, reforestation and afforestation are among the main carbon offsetting policies used by private companies in order to achieve their net-zero emission target³²². For this reason, investment in **policies to manage and extend the flora of protected areas** (i.e., parks and reserves) – not necessarily linked to increasing the number of trees, but also to improving management techniques in the protected area – is a typical example of public carbon offset policies. Consequently, public investments in this direction have been considered relevant activities with respect to **objective 1 (mitigation)** of the EU Taxonomy, as well as **objective 2 (adaptation)** for the impacts in terms of land management and improving resilience to climate change events, and **objective 6** thanks to the **biodiversity protection**.

At the same time, the most recent scientific literature analyses the role that protected areas have on air quality (in terms of reducing particulate PM_{2.5} and PM₁₀, sulphur dioxide, nitrogen dioxide and carbon monoxide) both within them and in the areas immediately surrounding the protected area; thus highlighting a positive temporal effect on air quality in proportion to the years the park has been in existence³²³ (**objective 5** of the EU Taxonomy). Other academic studies show how, for these properties, inhabitants of areas in or adjacent to nature parks enjoyed better air quality and thus lower long-term exposure to particulate, with improved resilience to the effects of the Covid-19 pandemic on the respiratory system³²⁴.

There is a growing scientific literature on “**water cultivation**” which points out that proper maintenance of greenery as well as reforestation and afforestation policies have a very important impact on the ability of the soil, thanks to tree roots, to promote the downward transit of rainwater to aquifers³²⁵. The roots also act as filters for water purification and influence precipitation³²⁶. For the above-mentioned reasons, the investments in this macro-category also contribute positively to **objective 3** of the EU Taxonomy.

The macro-category **protection of biodiversity and the health of eco-systems** also includes specific expenditures for the protection of species of flora and fauna (e.g., expenditure related to the implementation of the Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES), which deserve their own domain in the taxonomy (**objective 6**).

Finally, the specific items related to investments for the **protection of the marine environment and marine protected areas**, which are included in the same macro-category, are relevant not only to **objective 3** of the EU Taxonomy (*sustainable use and protection of water and marine resources*) and **objective 6** (for their role in safeguarding marine biodiversity), but also to **objectives 1 (mitigation)** and **2 (adaptation)** due to the CO₂ capture capacity of the oceans. From this point of view, the proper management of these areas can provide important mitigation services just as in the case of the management and maintenance of green areas³²⁷. This also includes expenditures related to the

³²² The goal of “*net-zero emissions*” is achieved by combining the production of greenhouse gas emissions, which are complementary to the economic activity of the company, with the reduction of emissions generated by offsetting policies (so-called, *carbon offsetting*).

³²³ Becchetti, L., Beccari, G., Conzo, P., De Santis, D. and Salustri, F., 2021 'Park municipalities and air quality'. Available at: SSRN 3933841 and Sustainability forth.

³²⁴ Becchetti, L., Beccari, G., Conzo, P., De Santis, D. and Salustri, F., 2022 'Particulate matter and COVID-19 excess deaths: Decomposing long-term exposure and short-term effects'. *Ecological Economics*, 194, p.107-340.

³²⁵ Eberhardt, U., Springgay, E., Gutierrez, V., Casallas-Ramirez, S. and Cohen, R., 2019 'Advancing the forest and water nexus: A capacity development facilitation guide'. Available at: <http://www.fao.org/documents/card/en/c/ca6483en>.

³²⁶ Meier, R., Schwaab, J., Seneviratne, S.I., Sprenger, M., Lewis, E. and Davin, E.L., 2021 “*Empirical estimate of forestation-induced precipitation changes in Europe*”. *Nature geoscience*, 14(7), pp.473-478. Available at: <https://www.nature.com/articles/s41561-021-00773-6>.

³²⁷ On this topic, see the following references: Roberts CM, O’Leary BC, McCauley DJ, Cury PM, Duarte CM, Lubchenco J, Pauly D, Sáenz-Arroyo A, Sumaila UR, Wilson RW, Worm B, Castilla JC (2017), ‘*Marine reserves can mitigate and promote adaptation to climate change*’, *Proc Natl Acad Sci U S A*. 2017 Jun 13;114(24):6167-6175; Azzurro E., “*Mediterranean Fever: the challenge of Marine Protected Areas to climate change: facts and ideas*”, National Research Council Editions, ISBN 978-88-8080-491-8; Rankovic A., Jacquemont J., Claudet J., Leclerc M., Picourt L. (2022), ‘*The contribution of marine protected areas to climate change adaptation state of the evidence and policy recommendations, ocean & climate platform*’, Policy Brief; Rodriguez K (2022), ‘*Marine Protected Areas: Restoring, preserving, and protecting the integrity and resilience of our ocean for future generations*’, UNFCCC; Hopitt G., Schmidt D.N., Brazier P., Mieszkowska N., Pieraccini M. (2022), ‘*Are marine protected areas an adaptation measure against climate change impacts on coastal ecosystems? A UK case study*’, *Nature-Based Solutions*, Vol. 2; O’Regan S.M., Archer S.K., Friesen S.K., Hunter K.L. (2021), ‘*A Global*

prevention and control of marine pollution and to coastal surveillance of the marine environment (related to the surveillance of the ecosystem and the contrast and prevention of eco-crimes).

Assessment of Climate Change Adaptation in Marine Protected Area Management Plans, Marine Science, Sec. Marine Conservation and Sustainability, Volume 8, <https://doi.org/10.3389/fmars.2021.711085>; "The First 13 Actions for Sustainable Adaptation: From the National Climate Change Conference and Preparatory Work Some Directions for Priority Action by the Ministry of the Environment", Astrid online; Roberts C.M. et al, (2017), "*Marine reserves can mitigate and promote adaptation to climate change*", Edited by B. L. Turner, Arizona State University, Tempe, AZ, <https://doi.org/10.1073/pnas.1701262114>; Ministry of the Environment, "Marine protected areas for climate", under the project "Parks for climate"; Climate Adapt, Project "Involving key actors in the Mediterranean in the ecosystem approach to manage marine protected areas to cope with climate change (MPA-Engage)", coordinated by the Institute of Marine Sciences of the Spanish National Research, Funding Source Programme 2014 - 2020 INTERREG VB Mediterranean.

Table of Sustainable Activities – Environmental Objective 1 “Climate Change Mitigation”

N.	Activity	Activity Description
1.1	Afforestation	<p>Establishment of forest through planting, deliberate seeding or natural regeneration on land that, until then, was under a different land use or not used. Afforestation implies a transformation of land use from non-forest to forest, in accordance with the Food and Agriculture Organisation of the United Nations (‘FAO’) definition of afforestation, where forest means a land matching the forest definition as set out in national law, or where not available, is in accordance with the FAO definition of forest. Afforestation may cover past afforestation as long as it takes place in the period between the planting of the trees and the time when the land use is recognised as a forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The economic activities in this category are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products and 02.40, i.e. support services to forestry.</p>
1.2	Rehabilitation and restoration of forests, including reforestation and natural forest regeneration after an extreme event	<p>Rehabilitation and restoration of forests as defined by national law. Where national law does not contain such a definition, rehabilitation and restoration corresponds to a definition with broad agreement in the peer-reviewed scientific literature for specific countries or a definition in line with the FAO concept of forest restoration or a definition in line with one of the definitions of ecological restoration applied to forest, or forest rehabilitation under the Convention on Biological Diversity. The economic activities in this category also include forest activities in line with the FAO definition of “reforestation” and “naturally regenerating forest” after an extreme event, where extreme event is defined by national law, and where national law does not contain such a definition, is in line with the IPCC definition of extreme weather event; or after a wildfire, where wildfire is defined by national law, and where national law does not contain such a definition, as defined in the European Glossary for wildfires and forest fires.</p> <p>The economic activities in this category imply no change of land use and occurs on degraded land matching the forest definition as set out in national law, or where not available, in accordance with the FAO definition of forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The economic activities in this category are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products and 02.40, i.e. support services to forestry.</p>
1.3	Forest management	<p>Forest management as defined by national law. Where national law does not contain such a definition, forest management corresponds to any economic activity resulting from a system applicable to a forest that influences the ecological, economic or social functions of the forest. Forest management assumes no change in land use and occurs on land matching the definition of forest as set out in national law, or where not available, in accordance with the FAO definition of forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The economic activities in this category are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products and 02.40, i.e. support services to forestry.</p>
1.4	Conservation forestry	<p>Forest management activities with the objective of preserving one or more habitats or species. Conservation forestry assumes no change in land category and occurs on land matching the forest definition as set out in national law, or where not available, in accordance with the FAO definition of forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The economic activities in this category are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products, and 02.40, i.e. support services to forestry.</p>
2.1	Restoration of wetlands	<p>Restoration of wetlands refers to economic activities that promote a return to original conditions of wetlands and economic activities that improve wetland functions without necessarily promoting a return to pre-disturbance conditions, with wetlands meaning land matching the international definition of wetland or of peatland as set out in the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). The concerned area matches the Union definition of wetlands, as provided in the Commission Communication on the wise use and conservation of wetlands.</p> <p>The economic activities in this category have no dedicated NACE code as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006, but relate to class 6 of the statistical classification of environmental protection activities (CEPA) established by Regulation (EU) No 691/2011 of the European Parliament and of the Council.</p>
3.1	Manufacture of renewable energy technologies	<p>Manufacture of renewable energy technologies, where renewable energy is defined in Article 2(1) of Directive (EU) 2018/2001.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C25, C27, C28 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.2	Manufacture of equipment for the production and use of hydrogen	<p>Manufacture of equipment for the production and use of hydrogen.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C25, C27, C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.3	Manufacture of low carbon technologies for transport	<p>Manufacture, repair, maintenance, retrofitting, repurposing and upgrade of low carbon transport vehicles, rolling stock and vessels.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C29.1, C30.1, C30.2, C30.9, C33.15, C33.17 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>

3.4	Manufacture of batteries	<p>Manufacture of rechargeable batteries, battery packs and accumulators for transport, stationary and off-grid energy storage and other industrial applications. Manufacture of respective components (battery active materials, battery cells, casings and electronic components).</p> <p>Recycling of end-of-life batteries.</p> <p>The economic activities in this category could be associated with NACE code C27.2 and E38.32 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.5	Manufacture of energy efficiency equipment for buildings	<p>Manufacture of energy efficiency equipment for buildings.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C16.23, C23.11, C23.20, C23.31, C23.32, C23.43, C.23.61, C25.11, C25.12, C25.21, C25.29, C25.93, C27.31, C27.32, C27.33, C27.40, C27.51, C28.11, C28.12, C28.13, C28.14, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.6	Manufacture of other low carbon technologies	<p>Manufacture of technologies aimed at substantial GHG emission reductions in other sectors of the economy, where those technologies are not covered in Sections 3.1 to 3.5 of this Annex.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular from C22, C25, C26, C27 and C28 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.7	Manufacture of cement	<p>Manufacture of cement clinker, cement or alternative binder.</p> <p>The economic activities in this category could be associated with NACE code C23.51 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.8	Manufacture of aluminium	<p>Manufacture of aluminium through primary alumina (bauxite) process or secondary aluminium recycling.</p> <p>The economic activities in this category could be associated with NACE code C24.42, C24.53 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.9	Manufacture of iron and steel	<p>Manufacture of iron and steel.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C24.10, C24.20, C24.31, C24.32, C24.33, C24.34, C24.51 and C24.52 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.10	Manufacture of hydrogen	<p>Manufacture of hydrogen and hydrogen-based synthetic fuels.</p> <p>The economic activities in this category could be associated with NACE code C20.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.11	Manufacture of carbon black	<p>Manufacture of carbon black.</p> <p>The economic activities in this category could be associated with NACE code C20.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.12	Manufacture of soda ash	<p>Manufacture of disodium carbonate (soda ash, sodium carbonate, carbonic acid disodium salt).</p> <p>The economic activities in this category could be associated with NACE code C20.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.13	Manufacture of chlorine	<p>Manufacture of chlorine.</p> <p>The economic activities in this category could be associated with NACE code C20.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>

3.14	Manufacture of organic basic chemicals	<p>Manufacture of:</p> <p>(a) high value chemicals (HVC):</p> <p>(i) acetylene;</p> <p>(ii) ethylene;</p> <p>(iii) propylene;</p> <p>(iv) butadiene.</p> <p>(b) Aromatics:</p> <p>(i) mixed alkylbenzenes, mixed alkylnaphthalenes other than HS 2707 or 2902;</p> <p>(ii) cyclohexane;</p> <p>(iii) benzene;</p> <p>(iv) toluene;</p> <p>(v) o-Xylene;</p> <p>(vi) p-Xylene;</p> <p>(vii) m-Xylene and mixed xylene isomers;</p> <p>(viii) ethylbenzene;</p> <p>(ix) cumene;</p> <p>(x) biphenyl, terphenyls, vinyltoluenes, other cyclic hydrocarbons excluding cyclanes, cyclenes, cycloterpenes, benzene, toluene, xylenes, styrene, ethylbenzene, cumene, naphthalene, anthracene;</p> <p>(xi) benzol (benzene), toluol (toluene) and xylol (xylenes)</p> <p>(xii) naphthalene and other aromatic hydrocarbon mixtures (excluding benzole, toluole, xylol).</p> <p>(c) vinyl chloride;</p> <p>(d) styrene;</p> <p>(e) ethylene oxide;</p> <p>(f) monoethylene glycol;</p> <p>(g) adipic acid.</p> <p>The economic activities in this category could be associated with NACE code C20.14 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.15	Manufacture of anhydrous ammonia	<p>Manufacture of anhydrous ammonia.</p> <p>The economic activities in this category could be associated with NACE code C20.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.16	Manufacture of nitric acid	<p>Manufacture of nitric acid.</p> <p>The economic activities in this category could be associated with NACE code C20.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
3.17	Manufacture of plastics in primary form	<p>Manufacture resins, plastics materials and non-vulcanisable thermoplastic elastomers, the mixing and blending of resins on a custom basis, as well as the manufacture of non-customised synthetic resins.</p> <p>The economic activities in this category could be associated with NACE code C20.16 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
4.1	Electricity generation using solar photovoltaic technology	<p>Construction or operation of electricity generation facilities that produce electricity using solar photovoltaic (PV) technology. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.2	Electricity generation using concentrated solar power (CSP) technology	<p>Construction or operation of electricity generation facilities that produce electricity using concentrated solar power (CSP) technology.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.3	Electricity generation from wind power	<p>Construction or operation of electricity generation facilities that produce electricity from wind power. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.4	Electricity generation from ocean energy technologies	<p>Construction or operation of electricity generation facilities that produce electricity from ocean energy.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.5	Electricity generation from hydropower	<p>Construction or operation of electricity generation facilities that produce electricity from hydropower.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.6	Electricity generation from geothermal energy	<p>Construction or operation of electricity generation facilities that produce electricity from geothermal energy.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>

4.7	Electricity generation from renewable non-fossil gaseous and liquid fuels	Construction or operation of electricity generation facilities that produce electricity using gaseous and liquid fuels of renewable origin. This activity does not include electricity generation from the exclusive use of biogas and bio-liquid fuels (see Section 4.8 of this Annex). The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.8	Electricity generation from bioenergy	Construction and operation of electricity generation installations that produce electricity exclusively from biomass, biogas or bioliquids, excluding electricity generation from blending of renewable fuels with biogas or bioliquids (see Section 4.7 of this Annex). The economic activities in this category could be associated with NACE code D35.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.9	Transmission and distribution of electricity	Construction and operation of transmission systems that transport the electricity on the extra high-voltage and high-voltage interconnected system. Construction and operation of distribution systems that transport electricity on high-voltage, medium-voltage and low-voltage distribution systems. The economic activities in this category could be associated with several NACE codes, in particular D35.12 and D35.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
4.10	Storage of electricity	Construction and operation of facilities that store electricity and return it at a later time in the form of electricity. The activity includes pumped hydropower storage. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category have no dedicated NACE code as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
4.11	Storage of thermal energy	Construction and operation of facilities that store thermal energy and return it at a later time in the form of thermal energy or other energy vectors. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category have no dedicated NACE code as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
4.12	Storage of hydrogen	Construction and operation of facilities that store hydrogen and return it at a later time. The economic activities in this category have no dedicated NACE code in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
4.13	Manufacture of biogas and biofuels for use in transport and of bioliquids	Manufacture of biogas or biofuels for use in transport and of bioliquids. The economic activities in this category could be associated with NACE code D35.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.14	Transmission and distribution networks for renewable and low-carbon gases	Conversion, repurposing or retrofit of gas networks for the transmission and distribution of renewable and low-carbon gases. Construction or operation of transmission and distribution pipelines dedicated to the transport of hydrogen or other low-carbon gases. The economic activities in this category could be associated with several NACE codes, in particular D35.22, F42.21 and H49.50 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.15	District heating/cooling distribution	Construction, refurbishment and operation of pipelines and associated infrastructure for distribution of heating and cooling, ending at the sub-station or heat exchanger. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.16	Installation and operation of electric heat pumps	Installation and operation of electric heat pumps. Where an economic activity is an integral element of 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category could be associated with several NACE codes, in particular D35.30 and F43.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.17	Cogeneration of heat/cool and power from solar energy	Construction and operation of facilities co-generating electricity and heat/cool from solar energy. The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.18	Cogeneration of heat/cool and power from geothermal energy	Construction and operation of facilities co-generating heat/cool and power from geothermal energy. The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.19	Cogeneration of heat/cool and power from renewable non-fossil gaseous and liquid fuels	Construction and operation of combined heat/cool and power generation facilities using gaseous and liquid fuels of renewable origin. This activity does not include cogeneration of heat/cool and power from the exclusive use of biogas and bio-liquid fuels (see Section 4.20 of this Annex). The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

4.20	Cogeneration of heat/cool and power from bioenergy	Construction and operation of installations used for cogeneration of heat/cool and power exclusively from biomass, biogas or bioliquids, and excluding cogeneration from blending of renewable fuels with biogas or bioliquids (see Section 4.19 of this Annex). The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.21	Production of heat/cool from solar thermal heating	Construction and operation of facilities producing heat/cool from solar thermal heating technology. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.22	Production of heat/cool from geothermal energy	Construction or operation of facilities that produce heat/cool from geothermal energy. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.23	Production of heat/cool from renewable non-fossil gaseous and liquid fuels	Construction and operation of heat generation facilities that produce heat/cool using gaseous and liquid fuels of renewable origin. This activity does not include production of heat/cool from the exclusive use of biogas and bio-liquid fuels (see Section 4.24 of this Annex). The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.24	Production of heat/cool from bioenergy	Construction and operation of facilities that produce heat/cool exclusively from biomass, biogas or bioliquids, and excluding production of heat/cool from blending of renewable fuels with biogas or bioliquids (see Section 4.23 of this Annex). The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.25	Production of heat/cool using waste heat	Construction and operation of facilities that produce heat/cool using waste heat. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.1	Construction, extension and operation of water collection, treatment and supply systems	Construction, extension and operation of water collection, treatment and supply systems. The economic activities in this category could be associated with several NACE codes, in particular E36.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.2	Renewal of water collection, treatment and supply systems	Renewal of water collection, treatment and supply systems including renewals to water collection, treatment and distribution infrastructures for domestic and industrial needs. It implies no material changes to the volume of flow collected, treated or supplied. The economic activities in this category could be associated with several NACE codes, in particular E36.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.3	Construction, extension and operation of waste water collection and treatment	Construction, extension and operation of centralised waste water systems including collection (sewer network) and treatment. The economic activities in this category could be associated with several NACE codes, in particular E37.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.4	Renewal of waste water collection and treatment	Renewal of centralised waste water systems including collection (sewer network) and treatment. It implies no material change related to the load or volume of flow collected or treated in the waste water system. The economic activities in this category could be associated with NACE codes E37.00 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.5	Collection and transport of non-hazardous waste in source segregated fractions	Separate collection and transport of non-hazardous waste in single or comingled fractions aimed at preparing for reuse or recycling. The economic activities in this category could be associated with NACE code E38.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.6	Anaerobic digestion of sewage sludge	Construction and operation of facilities for the treatment of sewage sludge by anaerobic digestion with the resulting production and utilisation of biogas or chemicals. The economic activities in this category could be associated with several NACE codes, in particular E37.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.7	Anaerobic digestion of bio-waste	Construction and operation of dedicated facilities for the treatment of separately collected bio-waste through anaerobic digestion with the resulting production and utilisation of biogas and digestate and/or chemicals. The economic activities in this category could be associated with several NACE codes, in particular E38.21 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.8	Composting of bio-waste	Construction and operation of dedicated facilities for the treatment of separately collected bio-waste through composting (aerobic digestion) with the resulting production and utilisation of compost. The economic activities in this category could be associated with several NACE codes, in particular E38.21 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.9	Material recovery from non-hazardous waste	Construction and operation of facilities for the sorting and processing of separately collected non-hazardous waste streams into secondary raw materials involving mechanical reprocessing, except for backfilling purposes. The economic activities in this category could be associated with several NACE codes, in particular E38.32 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

5.10	Landfill gas capture and utilisation	Installation and operation of infrastructure for landfill gas capture and utilisation in permanently closed landfills or landfill cells using new or supplementary dedicated technical facilities and equipment installed during or post landfill or landfill cell closure. The economic activities in this category could be associated with NACE code E38.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.11	Transport of CO ₂	Transport of captured CO ₂ via all modes. Construction and operation of CO ₂ pipelines and retrofit of gas networks where the main purpose is the integration of captured CO ₂ . The economic activities in this category could be associated with several NACE codes, in particular F42.21 and H49.50 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
5.12	Underground permanent geological storage of CO ₂	Permanent storage of captured CO ₂ in appropriate underground geological formations. The economic activities in this category could be associated with NACE code E39.00 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.1	Passenger interurban rail transport	Purchase, financing, rental, leasing and operation of passenger transport using railway rolling stock on mainline networks, spread over an extensive geographic area, passenger transport by interurban railways and operation of sleeping cars or dining cars as an integrated operation of railway companies. The economic activities in this category could be associated with several NACE codes, in particular H49.10, N77.39 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a) of this Section, that activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.
6.2	Freight rail transport	Purchase, financing, leasing, rental and operation of freight transport on mainline rail networks as well as short line freight railroads. The economic activities in this category could be associated with several NACE codes, in particular H49.20 and N77.39 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a) of this Section, that activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.
6.3	Urban and suburban transport, road passenger transport	Purchase, financing, leasing, rental and operation of urban and suburban transport vehicles for passengers and road passenger transport. For motor vehicles, operation of vehicles designated as category M2 or M3, in accordance with Article 4(1) of Regulation (EU) 2018/858, for the provision of passenger transport. The economic activities in this category may include operation of different modes of land transport, such as by motor bus, tram, streetcar, trolley bus, underground and elevated railways. This also includes town-to-airport or town-to-station lines and operation of funicular railways and aerial cableways where part of urban or suburban transit systems. The economic activities in this category also include scheduled long-distance bus services, charters, excursions and other occasional coach services, airport shuttles (including within airports), operation of school buses and buses for the transport. The economic activities in this category could be associated with several NACE codes, in particular H49.31, H49.3.9, N77.39 and N77.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.
6.4	Operation of personal mobility devices, cycle logistics	Selling, purchasing, financing, leasing, renting and operation of personal mobility or transport devices where the propulsion comes from the physical activity of the user, from a zero-emissions motor, or a mix of zero-emissions motor and physical activity. This includes the provision of freight transport services by (cargo) bicycles. The economic activities in this category could be associated with several NACE codes, in particular N77.11 and N77.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.5	Transport by motorbikes, passenger cars and light commercial vehicles	Purchase, financing, renting, leasing and operation of vehicles designated as category M1, N1, both falling under the scope of Regulation (EC) No 715/2007 of the European Parliament and of the Council, or L (2- and 3-wheel vehicles and quadricycles). The economic activities in this category could be associated with several NACE codes, in particular H49.32, H49.39 and N77.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a)(ii) and (b) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.
6.6	Freight transport services by road	Purchase, financing, leasing, rental and operation of vehicles designated as category N1, N2 or N3 falling under the scope of EURO VI, step E or its successor, for freight transport services by road. The economic activities in this category could be associated with several NACE codes, in particular H49.4.1, H53.10, H53.20 and N77.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (1)(a), (1)(b) or (1)(c)(i) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.

6.7	Inland passenger water transport	<p>Purchase, financing, leasing, rental and operation of passenger vessels on inland waters, involving vessels that are not suitable for sea transport.</p> <p>The economic activities in this category could be associated with NACE code H50.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.</p>
6.8	Inland freight water transport	<p>Purchase, financing, leasing, rental and operation of freight vessels on inland waters, involving vessels that are not suitable for sea transport.</p> <p>The economic activities in this category could be associated with several NACE code H50.4 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.</p>
6.9	Retrofitting of inland water passenger and freight transport	<p>Retrofit and upgrade of vessels for transport of freight or passengers on inland waters, involving vessels that are not suitable for sea transport.</p> <p>The economic activities in this category could be associated several NACE codes, in particular H50.4, H50.30 and C33.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
6.10	Sea and coastal freight water transport, vessels for port operations and auxiliary activities	<p>Purchase, financing, chartering (with or without crew) and operation of vessels designed and equipped for transport of freight or for the combined transport of freight and passengers on sea or coastal waters, whether scheduled or not. Purchase, financing, renting and operation of vessels required for port operations and auxiliary activities, such as tugboats, mooring vessels, pilot vessels, salvage vessels and ice-breakers.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular H50.2, H52.22 and N77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point 1 (a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.</p>
6.11	Sea and coastal passenger water transport	<p>Purchase, financing, chartering (with or without crew) and operation of vessels designed and equipped for performing passenger transport, on sea or coastal waters, whether scheduled or not. The economic activities in this category include operation of ferries, water taxis and excursions, cruise or sightseeing boats.</p> <p>The activity could be associated with several NACE codes, in particular H50.10, N77.21 and N77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.</p>
6.12	Retrofitting of sea and coastal freight and passenger water transport	<p>Retrofit and upgrade of vessels designed and equipped for the transport of freight or passengers on sea or coastal waters, and of vessels required for port operations and auxiliary activities, such as tugboats, mooring vessels, pilot vessels, salvage vessels and ice-breakers.</p> <p>The economic activities in this category could be associated with NACE codes H50.10, H50.2, H52.22, C33.15, N77.21 and N77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
6.13	Infrastructure for personal mobility, cycle logistics	<p>Construction, modernisation, maintenance and operation of infrastructure for personal mobility, including the construction of roads, motorways bridges and tunnels and other infrastructure that are dedicated to pedestrians and bicycles, with or without electric assist.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular F42.11, F42.12, F43.21, F71.1 and F71.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
6.14	Infrastructure for rail transport	<p>Construction, modernisation, operation and maintenance of railways and subways as well as bridges and tunnels, stations, terminals, rail service facilities, safety and traffic management systems including the provision of architectural services, engineering services, drafting services, building inspection services and surveying and mapping services and the like as well as the performance of physical, chemical and other analytical testing of all types of materials and products.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular F42.12, F42.13, M71.12, M71.20, F43.21, and H52.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
6.15	Infrastructure enabling road transport and public transport	<p>Construction, modernisation, maintenance and operation of infrastructure that is required for zero tailpipe CO2 operation of zero-emissions road transport, as well as infrastructure dedicated to transshipment, and infrastructure required for operating urban transport.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular F42.11, F42.13, F71.1 and F71.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>

6.16	Infrastructure for water transport	Construction, modernisation, operation and maintenance of infrastructure that is required for zero tailpipe CO2 operation of vessels or the port's own operations, as well as infrastructure dedicated to transshipment. The economic activities in this category could be associated with several NACE codes, in particular F42.91, F71.1 or F71.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
6.17	Airport infrastructure	Construction, modernisation, maintenance and operation of infrastructure that is required for zero tailpipe CO2 operation of aircraft or the airport's own operations, as well as for provision of fixed electrical ground power and preconditioned air to stationary aircraft. The economic activities in this category could be associated with several NACE codes, in particular F41.20 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity is an enabling activity as referred to in Article 10(1) point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
7.1	Construction of new buildings	Development of building projects for residential and non-residential buildings by bringing together financial, technical and physical means to realise the building projects for later sale as well as the construction of complete residential or non-residential buildings, on own account for sale or on a fee or contract basis. The economic activities in this category could be associated with several NACE codes, in particular F41.1 and F41.2, including also activities under F43, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
7.2	Renovation of existing buildings	Construction and civil engineering works or preparation thereof. The economic activities in this category could be associated with several NACE codes, in particular F41 and F43 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
7.3	Installation, maintenance and repair of energy efficiency equipment	Individual renovation measures consisting in installation, maintenance or repair of energy efficiency equipment. The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, C16, C17, C22, C23, C25, C27, C28, S95.21, S95.22, C33.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
7.4	Installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings)	Installation, maintenance and repair of charging stations for electric vehicles in buildings and parking spaces attached to buildings. The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, C16, C17, C22, C23, C25, C27 or C28 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
7.5	Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings	Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, and C16, C17, C22, C23, C25, C27, C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
7.6	Installation, maintenance and repair of renewable energy technologies	Installation, maintenance and repair of renewable energy technologies, on-site. The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, C16, C17, C22, C23, C25, C27 or C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.
7.7	Acquisition and ownership of buildings	Buying real estate and exercising ownership of that real estate. The economic activities in this category could be associated with NACE code L68 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
8.1	Data processing, hosting and related activities	Storage, manipulation, management, movement, control, display, switching, interchange, transmission or processing of data through data centres306, including edge computing. The economic activities in this category could be associated with NACE code J63.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. An economic activity in this category is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

8.2	Computer programming, consultancy and related activities	<p>Development or use of ICT solutions that are aimed at collecting, transmitting, storing data and at its modelling and use where those activities are predominantly aimed at the provision of data and analytics enabling GHG emission reductions. Such ICT solutions may include, inter alia, the use of decentralized technologies (i.e. distributed ledger technologies), Internet of Things (IoT), 5G and Artificial Intelligence. The economic activities in this category could be associated with several NACE codes, in particular J61, J62 and J63.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
9.1	Engineering activities and related technical consultancy dedicated to adaptation to climate change	<p>Research, applied research and experimental development of solutions, processes, technologies, business models and other products dedicated to the reduction, avoidance or removal of GHG emissions (RD&I) for which the ability to reduce, remove or avoid GHG emissions in the target economic activities has at least been demonstrated in a relevant environment, corresponding to at least Technology Readiness Level (TRL) 6314.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular M71.1.2 and M72.1, or for research that is an integral part of those economic activities for which technical screening criteria are specified in this Annex, the NACE codes set out in other Sections of this Annex in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
9.2	Close to market research, development and innovation	<p>Research, applied research and experimental development of solutions, processes, technologies, business models and other products dedicated to the direct air capture of CO₂ in the atmosphere. The economic activities in this category could be associated with several NACE codes, in particular M71.1.2 and M72.1 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.</p>
9.3	Professional services related to the energy performance of buildings	<p>Professional services related to the energy performance of buildings.</p> <p>The economic activities in this category could be associated to the NACE code M71 according to the statistical classification of economic activities as defined by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is a qualifying activity within the meaning of Article 10(1)(i) of Regulation (EU) 2020/852 if it fulfils the criteria for technical screening set out in this section.</p>

Table of Sustainable Activities - Environmental Objective 2 “Climate Change Adaptation”

N.	Activity	Activity Description
1.1	Afforestation	<p>Establishment of forest through planting, deliberate seeding or natural regeneration on land that, until then, was under a different land use or not used. Afforestation implies a transformation of land use from non-forest to forest, in accordance with the Food and Agriculture Organisation of the United Nations (‘FAO’) definition of afforestation, where forest means a land matching the forest definition as set out in national law, or where not available, is in accordance with the FAO definition of forest. Afforestation may cover past afforestation as long as it takes place in the period between the planting of the trees and the time when the land use is recognised as a forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Activities are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products and 02.40, i.e. support services to forestry.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>
1.2	Rehabilitation and restoration of forests, including reforestation and natural forest regeneration after an extreme event	<p>Rehabilitation and restoration of forests as defined by national law. Where national law does not contain such a definition, rehabilitation and restoration refers to a definition with broad agreement in the peer-reviewed scientific literature for specific countries or a definition in line with the FAO concept of forest restoration or a definition in line with one of the definitions of ecological restoration applied to forest, or forest rehabilitation under the Convention on Biological Diversity. The economic activities also include forest activities in line with the FAO definition of “reforestation” and “naturally regenerating forest” after an extreme event, where extreme event is defined by national law, and where national law does not contain such a definition, is in line with the IPCC definition of extreme weather event; or after a wildfire, where wildfire is defined by national law, and where national law does not contain such a definition, as defined in the European Glossary for wildfires and forest fires.</p> <p>The economic activities in this category imply no change of land use and occurs on degraded land matching the forest definition as set out in national law, or where not available, is in accordance with the FAO definition of forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The economic activities in this category are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products and 02.40, i.e. support services to forestry. Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>
1.3	Forest management	<p>Forest management as defined by national law. Where national law does not contain such a definition, forest management refers to any economic activity resulting from a system applicable to a forest that influences the ecological, economic or social functions of the forest.</p> <p>Forest management assumes no change in land use and occurs on land matching the definition of forest as set out in national law, or where not available, in accordance with the FAO definition of forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The economic activities in this category are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products and 02.40, i.e. support services to forestry. Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>
1.4	Conservation forestry	<p>Forest management activities with the objective of preserving one or more habitats or species.</p> <p>Conservation forestry assumes no change in land category and occurs on land matching the forest definition as set out in national law, or where not available, in accordance with the FAO definition of forest.</p> <p>The economic activities in this category could be associated with NACE code A2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The economic activities in this category are limited to NACE II 02.10, i.e. silviculture and other forestry activities, 02.20, i.e. logging, 02.30, i.e. gathering of wild growing non-wood products and 02.40, i.e. support services to forestry.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>
2.1	Restoration of wetlands	<p>Restoration of wetlands refers to economic activities that promote a return to original conditions of wetlands and economic activities that improve wetland functions without necessarily promoting a return to pre-disturbance conditions, with wetlands meaning land matching international definition of wetland or of peatland as set out in the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). The concerned area matches the Union definition of wetlands, as provided in the Commission Communication on the wise use and conservation of wetlands.</p> <p>The economic activities in this category have no dedicated NACE code as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006, but relate to class 6 of the statistical classification of environmental protection activities (CEPA) established by Regulation (EU) No 691/2011.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>
3.1	Manufacture of renewable energy technologies	<p>Manufacture of renewable energy technologies where renewable energy is as defined in Article 2(1) of Directive (EU) 2018/2001.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C25, C27, C28 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>

3.2	Manufacture of equipment for the production and use of hydrogen	<p>Manufacture of equipment for the production and use of hydrogen, where the hydrogen for the production of which equipment is manufactured complies with the life cycle GHG emissions savings requirement of 73.4 % [resulting in life-cycle GHG emissions lower than 3 tCO₂e/tH₂] and of 70% for hydrogen-based synthetic fuels relative to a fossil fuel comparator of 94g CO₂e/MJ in analogy to the approach set out in Article 25(2) of and Annex V to Directive (EU) 2018/2001 of the European Parliament and of the Council.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C25, C27, C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.3	Manufacture of low carbon technologies for transport	<p>Manufacture, repair, maintenance, retrofitting, repurposing and upgrade of low carbon transport vehicles, rolling stock and vessels, where the technology is one of the following:</p> <ul style="list-style-type: none"> (a) trains, passenger coaches and wagons that have zero direct (tailpipe) CO₂ emissions; (b) trains, passenger coaches and wagons that have zero direct tailpipe CO₂ emission when operated on a track with necessary infrastructure, and use a conventional engine where such infrastructure is not available (bimode); (c) urban, suburban and road passenger transport devices, where the direct (tailpipe) CO₂ emissions of the vehicles are zero; (d) until 31 December 2025, vehicles designated as categories M2 and M3 that have a type of bodywork classified as 'CA' (single-deck vehicle), 'CB' (double-deck vehicle), 'CC' (single-deck articulated vehicle) or 'CD' (double-deck articulated vehicle), and comply with the latest EURO VI standard, i.e. both with the requirements of Regulation (EC) No 595/2009 and, from the time of the entry into force of amendments to that Regulation, in those amending acts, even before they become applicable, and with the latest step of the Euro VI standard set out in Table 1 of Appendix 9 to Annex I to Regulation (EU) No 582/2011 where the provisions governing that step have entered into force but have not yet become applicable for this type of vehicle. Where such standard is not available, the direct CO₂ emissions of the vehicles are zero; (e) personal mobility devices with a propulsion that comes from the physical activity of the user, from a zero-emissions motor, or a mix of zero-emissions motor and physical activity; (f) vehicles of category M1 and N1 classified as light-duty vehicles with: <ul style="list-style-type: none"> (i) until 31 December 2025: specific emissions of CO₂, as defined in Article 3(1), point (h), of Regulation (EU) 2019/631, lower than 50gCO₂/km (low and zero-emission light-duty vehicles); (ii) from 1 January 2026: specific emissions of CO₂, as defined in Article 3(1), point (h), of Regulation (EU) 2019/631, are zero; (g) vehicles of category L with tailpipe CO₂ emissions equal to 0g CO₂e/km calculated in accordance with the emission test laid down in Regulation (EU) 168/2013; (h) vehicles of category N2 and N3, and N1 classified as heavy-duty vehicles, not dedicated to transporting fossil fuels with a technically permissible maximum laden mass not exceeding 7,5 tonnes that are 'zero-emission heavy-duty vehicles' as defined in Regulation (EU) 2019/1242; (i) vehicles of category N2 and N3 not dedicated to transporting fossil fuels with a technically permissible maximum laden mass exceeding 7,5 tonnes that are 'zero-emission heavy-duty vehicles', as defined in Article 3, point (11), of Regulation (EU) 2019/1242 or 'low-emission heavy-duty vehicles' as defined in Article 3, point (12) of that Regulation; (j) inland passenger water transport vessels that: <ul style="list-style-type: none"> (i) have zero direct (tailpipe) CO₂ emissions; (ii) until 31 December 2025, are hybrid or dual fuel vessels using at least 50 % of their energy from zero direct (tailpipe) CO₂ emission fuels or plug-in power for their normal operation; (k) inland freight water transport vessels, not dedicated to transporting fossil fuels, that: <ul style="list-style-type: none"> (i) have zero direct (tailpipe) CO₂ emission; (ii) until 31 December 2025, have direct (tailpipe) emissions of CO₂ per tonne kilometre (gCO₂/tkm), calculated (or estimated in case of new vessels) using the Energy Efficiency Operational Indicator, 50 % lower than the average reference value for emissions of CO₂ defined for heavy duty vehicles (vehicle subgroup 5- LH) in accordance with Article 11 of Regulation (EU) 2019/1242; (l) sea and coastal freight water transport vessels, vessels for port operations and auxiliary activities, that are not dedicated to transporting fossil fuels, that: <ul style="list-style-type: none"> (i) have zero direct (tailpipe) CO₂ emissions; (ii) until 31 December 2025, are hybrid and dual fuel vessels that derive at least 25 % of their energy from zero direct (tailpipe) CO₂ emission fuels or plug-in power for their normal operation at sea and in ports; (iii) until 31 December 2025, and only where it can be proven that the vessels are used exclusively for operating coastal and short sea services designed to enable modal shift of freight currently transported by land to sea, the vessels that have direct (tailpipe) CO₂ emissions, calculated using the International Maritime Organization (IMO) Energy Efficiency Design Index (EEDI) 95, 50 % lower than the average reference CO₂ emissions value defined for heavy duty vehicles (vehicle subgroup 5- LH) in accordance with Article 11 of Regulation (EU) 2019/1242; (iv) until 31 December 2025, the vessels have an attained Energy Efficiency Design Index (EEDI) value 10 % below the EEDI requirements applicable on 1 April 2022 if the vessels are able to run on zero direct (tailpipe) CO₂ emission fuels or on fuels from renewable sources; (m) sea and coastal passenger water transport vessels, not dedicated to transporting fossil fuels, that: <ul style="list-style-type: none"> (i) have zero direct (tailpipe) CO₂ emissions; (ii) until 31 December 2025, hybrid and dual fuel vessels derive at least 25 % of their energy from zero direct (tailpipe) CO₂ emission fuels or plug-in power for their normal operation at sea and in ports; (iii) until 31 December 2025, the vessels have an attained Energy Efficiency Design Index (EEDI) value 10 % below the EEDI requirements applicable on 1 April 2022 if the vessels are able to run on zero direct (tailpipe) CO₂ emission fuels or on fuels from renewable sources. <p>The economic activities in this category could be associated with several NACE codes, in particular C29.1, C30.1, C30.2, C30.9, C33.15, C33.17 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.4	Manufacture of batteries	<p>Manufacture of rechargeable batteries, battery packs and accumulators for transport, stationary and off-grid energy storage and other industrial applications and manufacture of respective components (battery active materials, battery cells, casings and electronic components) that result in substantial GHG emission reductions in transport, stationary and off-grid energy storage and other industrial applications.</p> <p>Recycling of end-of-life batteries. The economic activities in this category could be associated with NACE C27.2 and E38.3.2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>

3.5	Manufacture of energy efficiency equipment for buildings	<p>Manufacture of one or more of the following energy efficiency equipment products and their key components for buildings:</p> <ul style="list-style-type: none"> (a) windows with U-value lower or equal to 1,0 W/m²K; (b) doors with U-value lower or equal to 1,2 W/m²K; (c) external wall systems with U-value lower or equal to 0,5 W/m²K; (d) roofing systems with U-value lower or equal to 0,3 W/m²K; (e) insulating products with a lambda value lower or equal to 0,06 W/mK; (f) household appliances falling into the highest two populated classes of energy efficiency classes in accordance with Regulation (EU) 2017/1369 and the delegated acts adopted under that Regulation; (g) light sources rated in the highest two populated classes of energy efficiency in accordance with Regulation (EU) 2017/1369 and delegated acts adopted under that Regulation; (h) space heating and domestic hot water systems rated in the highest two populated classes of energy efficiency in accordance with Regulation (EU) 2017/1369 and delegated acts adopted under that Regulation; (i) cooling and ventilation systems rated in the highest two populated classes of energy efficiency in accordance with Regulation (EU) 2017/1369 and delegated acts adopted under that Regulation; (j) presence and daylight controls for lighting systems; (k) heat pumps compliant with the technical screening criteria set out in Section 4.16 of this Annex; (l) façade and roofing elements with a solar shading or solar control function, including those that support the growing of vegetation; (m) energy-efficient building automation and control systems for residential and nonresidential buildings; (n) zoned thermostats and devices for the smart monitoring of the main electricity loads or heat loads for buildings, and sensing equipment; (o) products for heat metering and thermostatic controls for individual homes connected to district heating systems, for individual flats connected to central heating systems serving a whole building, and for central heating systems; (p) district heating exchangers and substations compliant with the district heating/cooling distribution activity set out in Section 4.15 of this Annex; (q) products for smart monitoring and regulating of heating system, and sensing equipment. <p>The economic activities in this category could be associated with several NACE codes, in particular C16.23, C23.11, C23.20, C23.31, C23.32, C23.43, C.23.61, C25.11, C25.12, C25.21, C25.29, C25.93, C27.31, C27.32, C27.33, C27.40, C27.51, C28.11, C28.12, C28.13, C28.14, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.6	Manufacture of other low carbon technologies	<p>Manufacture of technologies aimed at substantial GHG emission reductions in other sectors of the economy, where those technologies are not covered in Sections 3.1 to 3.5 of this Annex and where those technologies demonstrate substantial life-cycle GHG emission savings compared to the best performing alternative technology, product or solution available on the market, calculated using Commission Recommendation 2013/179/EU or ISO 14067:2018 or ISO 14064-1:2018 and where the quantified life-cycle GHG emission savings are verified by an independent third party.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C22, C25, C26, C27 and C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.7	Manufacture of cement	<p>Manufacture of cement clinker, cement or alternative binder.</p> <p>The economic activities in this category could be associated with NACE code C23.51 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.8	Manufacture of aluminium	<p>Manufacture of aluminium through primary alumina (bauxite) process or secondary aluminium recycling.</p> <p>The economic activities in this category could be associated with NACE code C24.42, C24.53 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.9	Manufacture of iron and steel	<p>Manufacture of iron and steel.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular C24.10, C24.20, C24.31, C24.32, C24.33, C24.34, C24.51 and C24.52 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.10	Manufacture of hydrogen	<p>Manufacture of hydrogen and hydrogen-based synthetic fuels.</p> <p>The economic activities in this category could be associated with NACE code C20.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.11	Manufacture of carbon black	<p>Manufacture of carbon black.</p> <p>The economic activities in this category could be associated with NACE code C20.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.12	Manufacture of soda ash	<p>Manufacture of disodium carbonate (soda ash, sodium carbonate, carbonic acid disodium salt).</p> <p>The economic activities in this category could be associated with NACE code C20.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.13	Manufacture of chlorine	<p>Manufacture of chlorine.</p> <p>The economic activities in this category could be associated with NACE code C20.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>

3.14	Manufacture of organic basic chemicals	<p>Manufacture of:</p> <p>(a) high value chemicals (HVC):</p> <p>(i) acetylene;</p> <p>(ii) ethylene;</p> <p>(iii) propylene;</p> <p>(iv) butadiene.</p> <p>(b) Aromatics:</p> <p>(i) mixed alkylbenzenes, mixed alkylnaphthalenes other than HS 2707 or 2902;</p> <p>(ii) cyclohexane;</p> <p>(iii) benzene;</p> <p>(iv) toluene;</p> <p>(v) o-Xylene;</p> <p>(vi) p-Xylene;</p> <p>(vii) m-Xylene and mixed xylene isomers;</p> <p>(viii) ethylbenzene;</p> <p>(ix) cumene;</p> <p>(x) biphenyl, terphenyls, vinyltoluenes, other cyclic hydrocarbons excluding cyclanes, cyclenes, cycloterpenes, benzene, toluene, xylenes, styrene, ethylbenzene, cumene, naphthalene, anthracene;</p> <p>(xi) benzol (benzene), toluol (toluene) and xylol (xylenes);</p> <p>(xii) naphthalene and other aromatic hydrocarbon mixtures (excluding benzole, toluole, xylene).</p> <p>(c) vinyl chloride;</p> <p>(d) styrene;</p> <p>(e) ethylene oxide;</p> <p>(f) monoethylene glycol;</p> <p>(g) adipic acid.</p> <p>The economic activities in this category could be associated with NACE code C20.14 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.15	Manufacture of anhydrous ammonia	<p>Manufacture of anhydrous ammonia.</p> <p>The economic activities in this category could be associated with NACE code C20.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.16	Manufacture of nitric acid	<p>Manufacture of nitric acid.</p> <p>The economic activities in this category could be associated with NACE code C20.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
3.17	Manufacture of plastics in primary form	<p>Manufacture resins, plastics materials and non-vulcanisable thermoplastic elastomers, the mixing and blending of resins on a custom basis, as well as the manufacture of noncustomised synthetic resins.</p> <p>The economic activities in this category could be associated with NACE code C20.16 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.1	Electricity generation using solar photovoltaic technology	<p>Construction or operation of electricity generation facilities that produce electricity using solar photovoltaic (PV) technology. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.2	Electricity generation using concentrated solar power (CSP) technology	<p>Construction or operation of electricity generation facilities that produce electricity using concentrated solar power (CSP) technology.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.3	Electricity generation from wind power	<p>Construction or operation of electricity generation facilities that produce electricity from wind power.</p> <p>Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.4	Electricity generation from ocean energy technologies	<p>Construction or operation of electricity generation facilities that produce electricity from ocean energy.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.5	Electricity generation from hydropower	<p>Construction or operation of electricity generation facilities that produce electricity from hydropower.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.6	Electricity generation from geothermal energy	<p>Construction or operation of electricity generation facilities that produce electricity from geothermal energy.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
4.7	Electricity generation from renewable non-fossil gaseous and liquid fuels	<p>Construction or operation of electricity generation facilities that produce electricity using gaseous and liquid fuels of renewable origin. This activity does not include electricity generation from the exclusive use of biogas and bio-liquid fuels (see Section 4.8 of this Annex).</p> <p>The economic activities in this category could be associated with several NACE codes, in particular D35.11 and F42.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>

4.8	Electricity generation from bioenergy	Construction and operation of electricity generation installations that produce electricity exclusively from biomass, biogas or bioliquids, excluding electricity generation from blending of renewable fuels with biogas or bioliquids (see Section 4.7 of this Annex). The economic activities in this category could be associated with NACE code D35.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.9	Transmission and distribution of electricity	Construction and operation of transmission systems that transport electricity on the extra high-voltage and high-voltage interconnected system. Construction and operation of distribution systems that transport electricity on high-voltage, medium-voltage and low-voltage distribution systems. The economic activities in this category could be associated with several NACE codes, in particular D35.12 and D35.13 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.10	Storage of electricity	Construction and operation of facilities that store electricity and return it at a later time in the form of electricity. The activity includes pumped hydropower storage. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category have no dedicated NACE code as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.11	Storage of thermal energy	Construction and operation of facilities that store thermal energy and return it at a later time, in the form of thermal energy or other energy vectors. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category have no dedicated NACE code as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.12	Storage of hydrogen	Construction and operation of facilities that store hydrogen and return it at a later time. The economic activities in this category have no dedicated NACE code in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.13	Manufacture of biogas and biofuels for use in transport and of bioliquids	Manufacture of biogas or biofuels for use in transport and of bioliquids. The economic activities in this category could be associated with NACE code D35.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.14	Transmission and distribution networks for renewable and low-carbon gases	Conversion, repurposing or retrofit of gas networks for the transmission and distribution of renewable and low-carbon gases. Construction or operation of transmission and distribution pipelines dedicated to the transport of hydrogen and other low-carbon gases. The economic activities in this category could be associated with several NACE codes, in particular D35.21, F42.21 and H49.50 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.15	District heating/cooling distribution	Construction, refurbishment and operation of pipelines and associated infrastructure for distribution of heating and cooling, ending at the sub-station or heat exchanger. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.16	Installation and operation of electric heat pumps	Installation and operation of electric heat pumps. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category could be associated with several NACE codes, in particular D35.30, F43.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.17	Cogeneration of heat/cool and power from solar energy	Construction and operation of a facility co-generating electricity and heat/cool from solar energy. The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.18	Cogeneration of heat/cool and power from geothermal energy	Construction and operation of facilities co-generating heat/cool and power from geothermal energy. The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.19	Cogeneration of heat/cool and power from renewable non-fossil gaseous and liquid fuels	Construction and operation of combined heat/cool and power generation facilities using gaseous and liquid fuels of renewable origin. This activity does not include cogeneration of heat/cool and power from the exclusive use of biogas and bio-liquid fuels (see Section 4.20 of this Annex). The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.20	Cogeneration of heat/cool and power from bioenergy	Construction and operation of installations used for cogeneration of heat/cool and power exclusively from biomass, biogas, or bioliquids, excluding cogeneration from blending of renewable fuels with biogas or bioliquids (see Section 4.19 of this Annex). The economic activities in this category could be associated with several NACE codes, in particular D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

4.21	Production of heat/cool from solar thermal heating	Construction and operation of facilities producing heat/cool from solar thermal heating technology. Where an economic activity is an integral element of the 'Installation, maintenance and repair of renewable energy technologies' as referred to in Section 7.6 of this Annex, the technical screening criteria specified in Section 7.6 apply. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.22	Production of heat/cool from geothermal energy	Construction and operation of facilities that produce heat/cool from geothermal energy. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.23	Production of heat/cool from renewable non-fossil gaseous and liquid fuels	Construction and operation of heat generation facilities that produce heating/cool using gaseous and liquid fuels of renewable origin. This activity does not include production of heat/cool from the exclusive use of biogas and bio-liquid fuels (see Section 4.24 of this Annex). The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.24	Production of heat/cool from bioenergy	Construction and operation of facilities that produce heat/cool exclusively from biomass, biogas or bioliquids, excluding production of heat/cool from blending of renewable fuels with biogas or bioliquids (see Section 4.23 of this Annex). The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
4.25	Production of heat/cool using waste heat	Construction and operation of facilities that produce heat/cool using waste heat. The economic activities in this category could be associated with NACE code D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.1	Construction, extension and operation of water collection, treatment and supply systems	Construction, extension and operation of water collection, treatment and supply systems. The economic activities in this category could be associated with several NACE codes, in particular E36.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.2	Renewal of water collection, treatment and supply systems	Renewal of water collection, treatment and supply systems including renewals to water collection, treatment and distribution infrastructures for domestic and industrial needs. It implies no material changes to the volume of flow collected, treated or supplied. The economic activities in this category could be associated with several NACE codes, in particular E36.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.3	Construction, extension and operation of waste water collection and treatment	Construction, extension and operation of centralised waste water systems including collection (sewer network) and treatment. The economic activities in this category could be associated with several NACE codes, in particular E37.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.4	Renewal of waste water collection and treatment	Renewal of centralised waste water systems including collection (sewer network) and treatment. It implies no material change related to the load or volume of flow collected or treated in the waste water system. The economic activities in this category could be associated with NACE code E37.00 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.5	Collection and transport of non-hazardous waste in source segregated fractions	Separate collection and transport of non-hazardous waste in single or comingled fractions aimed at preparing for reuse or recycling. The economic activities in this category could be associated with NACE code E38.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.6	Anaerobic digestion of sewage sludge	Construction and operation of facilities for the treatment of sewage sludge by anaerobic digestion with the resulting production and utilisation of biogas or chemicals. The economic activities in this category could be associated with several NACE codes, in particular E37.00 and F42.00 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.7	Anaerobic digestion of bio-waste	Construction or operation of dedicated facilities for the treatment of separately collected biowaste through anaerobic digestion with the resulting production and utilisation of biogas and digestate or chemicals. The economic activities in this category could be associated with several NACE codes, in particular E38.21 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.8	Composting of bio-waste	Construction or operation of dedicated facilities for the treatment of separately collected biowaste through composting (aerobic digestion) with the resulting production and utilisation of compost. The economic activities in this category could be associated with several NACE codes, in particular E38.21 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.9	Material recovery from non-hazardous waste	Construction and operation of facilities for the sorting and processing of separately collected non-hazardous waste streams into secondary raw materials involving mechanical reprocessing, except for backfilling purposes. The economic activities in this category could be associated with several NACE codes, in particular E38.32 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

5.10	Landfill gas capture and utilisation	Installation and operation of infrastructure for landfill gas capture and utilisation in permanently closed landfills or landfill cells using new or supplementary dedicated technical facilities and equipment installed during or post landfill or landfill cell closure. The economic activities in this category could be associated with NACE code E38.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.11	Transport of CO ₂	Transport of captured CO ₂ via all modes, construction and operation of CO ₂ pipelines and retrofit of gas networks where the main purpose is the integration of captured CO ₂ and where: (a) the CO ₂ transported from the installation where it is captured to the injection point does not lead to CO ₂ leakages above 0.5 % of the mass of CO ₂ transported; (b) the CO ₂ is delivered to a permanent CO ₂ storage site that meets the criteria for underground geological storage of CO ₂ set out in section 5.12 of this Annex; or to other transport modalities, which lead to permanent CO ₂ storage site that meet those criteria; (c) appropriate leak detection systems are applied and a monitoring plan is in place, with the report verified by an independent third party; (d) the activity may include the installation of assets that increase the flexibility and improve the management of an existing network. The activity could be associated with several NACE codes, in particular F42.21 and H49.50 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
5.12	Underground permanent geological storage of CO ₂	Permanent storage of captured CO ₂ in appropriate underground geological formations. The economic activities in this category could be associated with NACE code E39.00 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.1	Passenger interurban rail transport	Purchase, financing, rental, leasing and operation of passenger transport using railway rolling stock on mainline networks, spread over an extensive geographic area, passenger transport by interurban railways and operation of sleeping cars or dining cars as an integrated operation of railway companies. The economic activities in this category could be associated with several NACE codes, in particular H49.10, N77.39 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.2	Freight rail transport	Purchase, financing, leasing, rental and operation of freight transport on mainline rail networks as well as short line freight railroads. The economic activities in this category could be associated with several NACE codes, in particular H49.20 and N77.39 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.3	Urban and suburban transport, road passenger transport	Purchase, financing, leasing, rental and operation of urban and suburban transport vehicles for passengers and road passenger transport. For motor vehicles, it includes operation of vehicles designated as category M2 or M3, in accordance with Article 4(1) of Regulation (EU) 2018/858, for the provision of passenger transport. The economic activities in this category may include operation of different modes of land transport, such as by motor bus, tram, streetcar, trolley bus, underground and elevated railways. This also includes town-to-airport or town-to-station lines and operation of funicular railways and aerial cableways where part of urban or suburban transit systems. The economic activities in this category also includes scheduled long-distance bus services, charters, excursions and other occasional coach services, airport shuttles (including within airports), operation of school buses and buses for the transport. The economic activities in this category could be associated with several NACE codes, in particular H49.31, H49.3.9, N77.39 and N77.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.4	Operation of personal mobility devices, cycle logistics	Selling, purchasing, leasing, renting and operation of personal mobility or transport devices where the propulsion comes from the physical activity of the user, from a zero-emissions motor, or a mix of zero-emissions motor and physical activity. This includes the provision of freight transport services by (cargo) bicycles. The economic activities in this category could be associated with several NACE codes, in particular N77.11 and N77.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.5	Transport by motorbikes, passenger cars and light commercial vehicles	Purchase, financing, leasing and operation of vehicles designated as category M1, N1 both falling under the scope of Regulation (EC) No 715/2007, or L (2- and 3-wheel vehicles and quadricycles). The economic activities in this category could be associated with several NACE codes, in particular H49.32, H49.39 and N77.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.6	Freight transport services by road	Purchase, financing, leasing, rental and operation of vehicles designated as category N1, N2 or N3 falling under the scope of EURO VI, step E or its successor for freight transport services by road. The economic activities in this category could be associated with several NACE codes, in particular H49.4.1, H53.10, H53.20 and N77.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.7	Inland passenger water transport	Purchase, financing, leasing, rental and operation of passenger vessels on inland waters, involving vessels that are not suitable for sea transport. The economic activities in this category could be associated with several NACE codes, in particular H50.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.8	Inland freight water transport	Purchase, financing, leasing, rental and operation of freight vessels on inland waters, involving vessels that are not suitable for sea transport. The economic activities in this category could be associated with several NACE codes, in particular H50.4 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.9	Retrofitting of inland water passenger and freight transport	Retrofit and upgrade of vessels for transport of freight or passengers on inland waters, involving vessels that are not suitable for sea transport. The economic activities in this category could be associated with several NACE codes, in particular H50.4, H50.30 and C33.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

6.10	Sea and coastal freight water transport, vessels for port operations and auxiliary activities	Purchase, financing, chartering (with or without crew) and operation of vessels designed and equipped for transport of freight or for the combined transport of freight and passengers on sea or coastal waters, whether scheduled or not. Purchase, financing, renting and operation of vessels required for port operations and auxiliary activities, such as tugboats, mooring vessels, pilot vessels, salvage vessels and ice-breakers. The economic activities in this category could be associated with several NACE codes, in particular H50.2, H52.22 and N77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.11	Sea and coastal passenger water transport	Purchase, financing, chartering (with or without crew) and operation of vessels designed and equipped for performing passenger transport, on sea or coastal waters, whether scheduled or not. The economic activities in this category include operation of ferries, water taxis and excursions, cruise or sightseeing boats. The economic activities in this category could be associated with several NACE codes, in particular H50.10, N77.21 and N77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.12	Retrofitting of sea and coastal freight and passenger water transport	Retrofit and upgrade of vessels designed and equipped for the transport of freight or passengers on sea or coastal waters, and of vessels required for port operations and auxiliary activities, such as tugboats, mooring vessels, pilot vessels, salvage vessels and ice-breakers. The economic activities in this category could be associated with NACE codes H50.10, H50.2, H52.22, C33.15, N77.21 and N.77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.13	Infrastructure for personal mobility, cycle logistics	Construction, modernisation, maintenance and operation of infrastructure for personal mobility, including the construction of roads, motorways bridges and tunnels and other infrastructure that are dedicated to pedestrians and bicycles, with or without electric assist. The economic activities in this category could be associated with several NACE codes, in particular F42.11, F42.12, F42.13, F43.21, F711 and F71.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.14	Infrastructure for rail transport	Construction, modernisation, operation and maintenance of railways and subways as well as bridges and tunnels, stations, terminals, rail service facilities, safety and traffic management systems including the provision of architectural services, engineering services, drafting services, building inspection services and surveying and mapping services and the like as well as the performance of physical, chemical and other analytical testing of all types of materials and products. The economic activities in this category could be associated with several NACE codes, in particular F42.12, F42.13, M71.12, M71.20, F43.21, and H52.21 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.15	Infrastructure enabling road transport and public transport	Construction, modernisation, maintenance and operation of motorways, streets, roads, other vehicular and pedestrian ways, surface work on streets, roads, highways, bridges or tunnels and construction of airfield runways, including the provision of architectural services, engineering services, drafting services, building inspection services and surveying and mapping services and the like as well as the performance of physical, chemical and other analytical testing of all types of materials and products, and excludes the installation of street lighting and electrical signals. The economic activities in this category could be classified under several NACE codes, in particular F42.11, F42.13, F71.1 and F71.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.16	Infrastructure for water transport	Construction, modernisation and operation of waterways, harbour and rivers works, pleasure ports, locks, dams and dykes and other, including the provision of architectural services, engineering services, drafting services, building inspection services and surveying and mapping services and the like as well as the performance of physical, chemical and other analytical testing of all types of materials and products and excludes project management activities related to civil engineering works. The economic activities in this category exclude dredging of waterways. The economic activities in this category could be associated with several NACE codes, in particular F42.91, F71.1 or F71.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
6.17	Airport infrastructure	Construction, modernisation and operation of infrastructure that is required for zero tailpipe CO2 operation of aircraft or the airport's own operations, as well as for provision of fixed electrical ground power and preconditioned air to stationary aircraft. The economic activities in this category could be classified under several NACE codes, in particular F41.20 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
7.1	Construction of new buildings	Development of building projects for residential and non-residential buildings by bringing together financial, technical and physical means to realise the building projects for later sale as well as the construction of complete residential or non-residential buildings, on own account for sale or on a fee or contract basis. The economic activities in this category could be associated with several NACE codes, in particular F41.1 and F41.2, including also activities under F43, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
7.2	Renovation of existing buildings	Construction and civil engineering works or preparation thereof. The economic activities in this category could be associated with several NACE codes, in particular F41 and F43 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

7.3	Installation, maintenance and repair of energy efficiency equipment	<p>Individual renovation measures consisting in installation, maintenance or repair of energy efficiency equipment. The economic activities in this category consist in one of the following individual measures, provided that they comply with minimum requirements set for individual components and systems in the applicable national measures implementing Directive 2010/31/EU and, where applicable, are rated in the highest two populated classes of energy efficiency in accordance with Regulation (EU) 2017/1369 and delegated acts adopted under that Regulation:</p> <p>(a) addition of insulation to existing envelope components, such as external walls (including green walls), roofs (including green roofs), lofts, basements and ground floors (including measures to ensure air-tightness, measures to reduce the effects of thermal bridges and scaffolding) and products for the application of the insulation to the building envelope (including mechanical fixings and adhesive);</p> <p>(b) replacement of existing windows with new energy efficient windows;</p> <p>(c) replacement of existing external doors with new energy efficient doors;</p> <p>(d) installation and replacement of energy efficient light sources;</p> <p>(e) installation, replacement, maintenance and repair of heating, ventilation and airconditioning (HVAC) and water heating systems, including equipment related to district heating services, with highly efficient technologies;</p> <p>(f) installation of low water and energy using kitchen and sanitary water fittings which comply with technical specifications set out in Appendix A to Annex I to this Regulation and in case of shower solutions, mixer showers, shower outlets and taps have a max water flow of 6 L/min or less attested by an existing label in the Union market.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, C16, C17, C22, C23, C25, C27, C28, S95.21, S95.22, C33.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
7.4	Installation, maintenance and repair of charging stations for electric vehicles in buildings (and parking spaces attached to buildings)	<p>Installation, maintenance and repair of charging stations for electric vehicles in buildings and parking spaces attached to buildings.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, C16, C17, C22, C23, C25, C27 or C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
7.5	Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings	<p>Installation, maintenance and repair of instruments and devices for measuring, regulation and controlling energy performance of buildings, consisting in one of the following measures:</p> <p>(a) installation, maintenance and repair of zoned thermostats, smart thermostat systems and sensing equipment, including motion and day light control;</p> <p>(b) installation, maintenance and repair of building automation and control systems, building energy management systems (BEMS), lighting control systems and energy management systems (EMS);</p> <p>(c) installation, maintenance and repair of smart meters for gas, heat, cool and electricity;</p> <p>(d) installation, maintenance and repair of façade and roofing elements with a solar shading or solar control function, including those that support the growing of vegetation.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, and C16, C17, C22, C23, C25, C27, C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
7.6	Installation, maintenance and repair of renewable energy technologies	<p>Installation, maintenance and repair of renewable energy technologies, on-site, consisting in one of the following individual measures, if installed on-site as technical building systems:</p> <p>(a) installation, maintenance and repair of solar photovoltaic systems and the ancillary technical equipment;</p> <p>(b) installation, maintenance and repair of solar hot water panels and the ancillary technical equipment;</p> <p>(c) installation, maintenance, repair and upgrade of heat pumps contributing to the targets for renewable energy in heat and cool in accordance with Directive (EU) 2018/2001 and the ancillary technical equipment;</p> <p>(d) installation, maintenance and repair of wind turbines and the ancillary technical equipment;</p> <p>(e) installation, maintenance and repair of solar transpired collectors and the ancillary technical equipment;</p> <p>(f) installation, maintenance and repair of thermal or electric energy storage units and the ancillary technical equipment;</p> <p>(g) installation, maintenance and repair of high efficiency micro CHP (combined heat and power) plant;</p> <p>(h) installation, maintenance and repair of heat exchanger/recovery systems.</p> <p>The economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, C16, C17, C22, C23, C25, C27 or C28, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
7.7	Acquisition and ownership of buildings	<p>Buying real estate and exercising ownership of that real estate.</p> <p>The economic activities in this category could be associated with NACE code L68 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
8.1	Data processing, hosting and related activities	<p>Storage, manipulation, management, movement, control, display, switching, interchange, transmission or reception of diversity of data through data centres, including edge computing.</p> <p>The economic activities in this category could be associated with NACE code J63.1.1 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>
8.2	Computer programming, consultancy and related activities	<p>Providing expertise in the field of information technologies: writing, modifying, testing and supporting software; planning and designing computer systems that integrate computer hardware, software and communication technologies; on-site management and operation of clients' computer systems or data processing facilities; and other professional and technical computer-related activities. The economic activities in this category could be associated with NACE code J62 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p>

8.3	Programming and broadcasting activities	<p>Programming and broadcasting activities include creating content or acquiring the right to distribute content and subsequently broadcasting that content, such as radio, television and data programs of entertainment, news, talk, and the like, including data broadcasting, typically integrated with radio or TV broadcasting. The broadcasting can be performed using different technologies, over-the-air, via satellite, via a cable network or via Internet. This also includes the production of programs that are typically narrowcast in nature (limited format, such as news, sports, education, and youth-oriented programming) on a subscription or fee basis, to a third party, for subsequent broadcasting to the public.</p> <p>The economic activities in this category could be associated with NACE code J60 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>
9.1	Engineering activities and related technical consultancy dedicated to adaptation to climate change	<p>Engineering activities and related technical consultancy dedicated to adaptation to climate change.</p> <p>The economic activities in this category could be associated with NACE code M71.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852 where it meets the technical screening criteria specified this section.</p>
9.2	Close to market research, development and innovation	<p>Research, applied research and experimental development of solutions, processes, technologies, business models and other products dedicated to climate change adaptation.</p> <p>The economic activities in this category could be associated with NACE code M72 or for research that is an integral part of those economic activities for which technical screening criteria are specified in this Annex the NACE codes set out in other Sections of this Annex in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852 where it meets the technical screening criteria set out in this Section.</p>
10.1	Non-life insurance: underwriting of climate-related perils.	<p>Provision of the following insurance services (other than life insurance) as defined in Annex I of Commission Delegated Regulation (EU) 2015/35 of 10 October 2014 related to the underwriting of climate related perils set out in Appendix A to this Annex:</p> <ul style="list-style-type: none"> (a) medical expense insurance; (b) income protection insurance; (c) workers' compensation insurance; (d) motor vehicle liability insurance; (e) other motor insurance; (f) marine, aviation and transport insurance; (g) fire and other damage to property insurance; (h) assistance. <p>The economic activities in this category could be associated with NACE code K65.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852 where it meets the technical screening criteria set out in this section.</p>
10.2	Reinsurance	<p>Coverage of risks stemming from climate-related perils set out in Appendix A to this Annex ceded by the insurer to the reinsurer. The coverage is set out in an agreement between insurer and reinsurer specifying the insurers' products ("underlying product") from which the ceded risks originate. A reinsurance intermediary may be involved in the preparation or conclusion of the contractual agreement between the insurer and the reinsurer.</p> <p>The economic activities in this category could be associated with NACE code K65.20 in accordance with to the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>An economic activity in this category is an enabling activity as referred to in Article 11(1) point (b) of Regulation (EU) 2020/852 where it meets the technical screening criteria set out this section.</p>
11	Education	<p>Public or private education at any level or for any profession. The instructions may be oral or written and may be provided by radio, television, internet or via correspondence. It includes education by the different institutions in the regular school system at its different levels as well as adult education and literacy programmes, including military schools, academies and prison schools at their respective levels.</p> <p>The economic activities in this category could be associated with NACE code P85 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this section.</p>
12.1	Residential care activities	<p>Provision of residential care combined with either nursing, supervisory or other types of care as required by the residents. Facilities are a significant part of the production process and the care provided is a mix of health and social services with the health services being largely some level of nursing services.</p> <p>The economic activities in this category could be associated with NACE code Q87 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006</p>
13.1	Creative, arts and entertainment activities	<p>Creating, arts and entertainment activities include the provision of services to meet the cultural and entertainment interests of their customers. This includes the production and promotion of, and participation in, live performances, events or exhibits intended for public viewing and the provision of artistic, creative or technical skills for the production of artistic products and live performances. These activities exclude the operation of museums of all kinds, botanical and zoological gardens, the preservation of historical sites and nature reserves activities, gambling and betting activities as well as sports and amusement and recreation activities.</p> <p>The economic activities in this category could be associated with NACE code R90 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>

13.2	Libraries, archives, museums and cultural activities	<p>Libraries, archives, museums and cultural activities includes the activities of libraries and archives, the operation of museums of all kinds, botanical and zoological gardens, the operation of historical sites and nature reserves activities. These activities also include the preservation and exhibition of objects, sites and natural wonders of historical, cultural or educational interest, including world heritage sites. These activities exclude sports and amusement and recreation activities such as the operation of bathing beaches and recreation parks.</p> <p>The economic activities in this category could be associated with NACE code R91 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>
13.3	Motion picture, video and television programme production, sound recording and music publishing activities	<p>Motion picture, video and television programme production, sound recording and music publishing activities include the production of theatrical and non-theatrical motion pictures whether on film, video tape or disc for direct projection in theatres or for broadcasting on television, supporting activities such as film editing, cutting or dubbing, distribution of motion pictures and other film productions to other industries as well as motion picture or other film productions projection. Buying and selling of motion picture or other film productions distribution rights is also included. These activities also include the sound recording activities, including the production of original sound master recordings, releasing, promoting and distributing them, publishing of music as well as sound recording service activities in a studio or elsewhere.</p> <p>The economic activities in this category could be associated with NACE code J59 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.</p> <p>Where an economic activity in this category complies with the substantial contribution criterion specified in point 5, the activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, provided that it meets the technical screening criteria set out in this Section.</p>

Annex III: Ex-post external review

REPORT REVIEW

The Republic of Italy BTP Green Allocation and Impact Report

BTP Green Allocation and Impact Report the Republic of Italy

15 June 2023

VERIFICATION PARAMETERS

Type(s) of reporting	<ul style="list-style-type: none"> Green Allocation and Impact Report
Relevant standard(s)	<ul style="list-style-type: none"> Harmonised Framework for Impact Reporting (HFIR), updated June 2022, as administered by International Capital Market Association (ICMA)
Scope of verification	<ul style="list-style-type: none"> The Republic of Italy's BTP Green Allocation and Impact Report (as of June 14, 2023) The Republic of Italy's Framework for the Issuance of Sovereign Green Bonds (as of February 25, 2021) Bond identification: IT0005508590/ April 30, 2035 (EUR 7.94 billion)
Lifecycle	<ul style="list-style-type: none"> Post-issuance verification
Validity	<ul style="list-style-type: none"> As long as no changes are undertaken by the Issuer to its BTP Green Allocation and Impact Report as of June 14, 2023

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SCOPE OF WORK

The Republic of Italy (“the Issuer”) commissioned ISS Corporate Solutions (ICS) to provide a Report Review³²⁸ on its BTP Green Allocation and Impact Report by assessing:

1. The alignment of the Republic of Italy’s BTP Green Allocation and Impact Report with the commitments set forth in The Republic of Italy Framework for the Issuance of Sovereign Green Bonds (as of February 25, 2021).
2. The Republic of Italy’s BTP Green Allocation and Impact Report - benchmarked against Harmonised Framework for Impact Reporting (HFIR) updated as of June 2022.
3. The disclosure of proceeds allocation and soundness of reporting indicators – whether the impact metrics align with best market practices and are relevant to the Green Bonds issued.

³²⁸ A limited or reasonable assurance is not provided on the information presented in The Republic of Italy’s BTP Green Allocation and Impact Report. A review of the use of proceeds’ allocation and impact reporting is solely conducted against ICMA’s Standards (Green Bond Principles) core principles and recommendations where applicable, and the criteria outlined in the underlying Framework. The assessment is solely based on the information provided in the allocation and impact reporting. The Issuer [The Republic of Italy] is responsible for the preparation of the report including the application of methods and internal control procedures designed to ensure that the subject matter information is free from material misstatement.

ASSESSMENT SUMMARY





REVIEW SECTION	SUMMARY	EVALUATION
Part 1. Alignment with the Issuer's commitments set forth in the Framework	The Republic of Italy's BTP Green Allocation and Impact Report meets the Issuer's commitments set forth in the Framework for the Issuance of Sovereign Green Bonds. The proceeds have been used to (re)finance Renewable Electricity and Heat, Energy Efficiency, Transport, Pollution Prevention and Control, and Circular Economy, Protection of the Environment and Biological Diversity, and Research in accordance with the eligibility criteria defined in the Framework except for the project fiscal incentives to improve building efficiency, called "Ecobonus".	Aligned <i>(however, proceeds have also been allocated to the project "Ecobonus", which does not fully meet the criteria originally set in the framework)</i>
Part 2. Alignment with the Harmonised Framework for Impact Reporting (HFIR)	The Republic of Italy's BTP Green Allocation and Impact Report is in line with ICMA's Harmonised Framework for Impact Reporting. The Issuer follows core principles and where applicable key recommendations. Allocation of proceeds is disclosed at a project category level. The report was produced on an annual basis and includes impact indicators for most of the financed projects.	Aligned
Part 3. Disclosure of proceeds allocation and soundness of reporting indicators	The allocation of the bond's proceeds has been disclosed, with a detailed breakdown across different eligible project categories as proposed in the Framework ³²⁹ . The Republic of Italy's Framework for the Issuance of Sovereign Green Bonds has adopted an appropriate methodology to report the impact generated by providing comprehensive disclosure on data sourcing, calculations methodologies and granularity reflecting best market practices.	Positive

³²⁹ The assessment is based on the information provided in the Issuer's report. The Issuer is responsible for the preparation of the report including the application of methods and procedures designed to ensure that the subject matter information is free from material misstatement.

REPORT REVIEW ASSESSMENT

PART I: ALIGNMENT WITH COMMITMENTS SET FORTH IN THE FRAMEWORK FOR THE ISSUANCE OF SOVEREIGN GREEN BONDS

The following table evaluates the BTP Green Allocation and Impact Report against the commitments set forth in the Republic of Italy's Framework, which are based on the core requirements of the Green Bond Principles as well as best market practices.

GBP	OPINION	ALIGNMENT WITH COMMITMENT
1. Use of Proceeds	<p>The Republic of Italy confirms to follow the Use of Proceeds' description provided by the Republic of Italy's Framework for the Issuance of Sovereign Green Bonds except for alignment with the defined project categories.</p> <p>The Issuer's green categories align with the project categories except for the project fiscal incentives to improve building efficiency, called "Ecobonus"³³⁰. For all other green categories, they are in accordance with the eligibility criteria set in the Republic of Italy's Framework for the Issuance of Sovereign Green Bonds.</p> <p>The Issuer confirms that eligible expenses were selected from a period between three years before the bond issuance. Environmental benefits at the category level are described and quantified. Moreover, the Issuer has excluded any harmful project categories as committed in the Framework.</p>	 <i>(with only one exception: the project Fiscal incentives to improve building efficiency, called "Ecobonus")</i>
2. Process for Project Evaluation and Selection	<p>The Republic of Italy confirms to follow the Process for Project Evaluation and Selection description provided by the Republic of Italy's Framework for the Issuance of Sovereign Green Bonds. The report is in line with the initial commitments set in the Republic of Italy's Framework for the Issuance of Sovereign Green Bonds.</p> <p>The Issuer confirms that the Eligible Green Projects were designated by the Interministerial Committee composed of representatives of various Italian Ministries.</p>	
3. Management of Proceeds	<p>The Republic of Italy confirms to follow the Process for Management of Proceeds description provided by The Republic of Italy's Framework for the Issuance of Sovereign Green Bonds. The report is in line with the initial commitments set in the Republic of Italy's Framework for the Issuance of Sovereign Green Bonds:</p> <p>The proceeds collected are equal to the amount allocated to eligible projects, with no exceptions. The proceeds are tracked in an appropriate manner and attested in a formal internal process.</p> <p>Moreover, the proceeds have been fully allocated within 24 months after the issuance, and any expenditures that were no longer eligible were replaced within 12 months.</p>	
4. Reporting	<p>The Republic of Italy Impact Report is coherent with the Reporting description provided by The Republic of Italy's Framework for the Issuance of Sovereign Green Bonds. The report is in line with the initial commitments set in the Republic of Italy's Framework for the Issuance of Sovereign Green Bonds:</p>	

³³⁰ With regard to the category Energy Efficiency, the project financed (Fiscal incentives to improve building efficiency, called "Ecobonus") is not in line with the criteria "Investment expenditures that bring at least two levels improvement on the Italian energy efficiency scale". This incentive is targeted at interventions such as building insulation, fixtures upgrade, solar panels installation. After the intervention, it is required to provide a new EPC but the increase of two levels is not mandatory. The Issuer has reported the environmental benefits that the financed "Ecobonus" projects have achieved.

	<p>The sections “Allocation of resources” and “Environmental impact assessment of green projects” of the BTP Green Allocation and Impact Report comply with the pre-issuance commitment expressed in the framework. The report is intended to be publicly available.</p> <p><i>Further analysis of this section is available in Part III of this report.</i></p>	
5. Verification	<p>The Republic of Italy’s Framework for the Issuance of Sovereign Green Bonds has received a Second Party Opinion (SPO).</p>	

PART II: ASSESSMENT AGAINST THE ICMA HARMONISED FRAMEWORK FOR IMPACT REPORTING

Reporting is a core component of the GBP and transparency is of particular value in communicating the expected and/or achieved impact of projects in the form of an annual reporting. Green bond Issuers are required to report on both the use of green bond proceeds, as well as the environmental impacts at least on an annual basis until full allocation or maturity of the bond. Harmonised Framework for Impact Reporting (HFIR) has been chosen as benchmark for this analysis as it represents the most widely adopted standard.

The table below evaluates the Republic of Italy BTP Green Allocation and Impact Report against ICMA Harmonised Framework for Impact Reporting (HFIR).

CORE PRINCIPLES		
ICMA HFIR	BTP Green Allocation and Impact Report	ASSESSMENT
Reporting on an annual basis	The Republic of Italy has reported on an annual basis from issuance and all the proceeds have been fully allocated. The report will be available on the Italian Ministry of Economy and Finance's website ³³¹ .	✓
Illustrating the environmental impacts or outcomes	<p>The assessment and measurement of the impacts generated by the Republic of Italy's Green Bonds covered the following areas:</p> <ul style="list-style-type: none"> a. <u>Renewable Electricity and Heat</u> <ul style="list-style-type: none"> ▪ Fiscal incentives focused on the development of renewable and other low-carbon energies: number of users and quantities of electricity involved (kWh) and tonnes of CO₂ avoided emissions. b. <u>Energy Efficiency</u> <ul style="list-style-type: none"> ▪ Fiscal incentives to improve building efficiency: Energy saving (GWh/y) and CO₂ avoided emissions. c. <u>Transport</u> <ul style="list-style-type: none"> ▪ Incentives for rail freight transportation: estimated increased use of rail for goods transportation, tonnes of CO₂eq avoided per year, air pollutants (PM_{2.5}, NMVOC, SO₂, and NO_x) avoided, and monetization of minor total externalities³³² ▪ Subways: national endowment of urban and suburban railway infrastructure (km of network), passenger traffic (millions of passenger-km) ▪ Railway infrastructures and HS-HC lines: estimated future emissions avoided (tCO₂eq), and future air pollutants (PM_{2.5}, NO_x, NMVOC, SO₂) reduced (tons/year), decrease in road traffic (million of vehicle-km/ year for the urban or subway or airport section), scrap materials management (m³ and % of material reused) 	✓

³³¹ Italian Ministry of Economy and Finance's website:

https://www.dt.mef.gov.it/en/debito_pubblico/emissioni_titoli_di_stato_interni/comunicazioni_emissioni_btp_green/post_emissioni/

³³² Savings for society linked to lower road traffic, reduction of greenhouse gases, air and noise pollution, accidents and costs related to congestion.

	<p>d. <u>Pollution Prevention and Control, and Circular Economy</u></p> <ul style="list-style-type: none"> Integrated Waste Cycle: recycling rate, number of waste treatment plant per type, % of waste sent to landfills out of total regional municipal waste Soil pollution: number of sites surveyed for status of contamination Air pollution: improvement of % of Italian territory of air pollution (NO₂, ozone, PM₁₀, PM_{2.5}) average annual limit that is respected compared to 2013 Water pollution: Volumes of litter stranded, Clean Coast Index (CCI), Quality of marine environment in terms of concentration of chlorophyll-phytoplankton and PREI index (Posidonia Rapid Easy Index) <p>e. <u>Protection of the Environment and Biological Diversity</u></p> <ul style="list-style-type: none"> Water infrastructure: catchment area efficiency, number of residents without sewage service and purification service which could be mitigated; storage capacity of water resources in large dams (m³); Marine protected areas, national parks and state nature reserves: % protection coverage of key biodiversity area surveyed, hectares of wooded area, number of national parks and regional parks, and the respective area (million hectares) and % of the territory, number of protected marine areas (EUAP) and submerged parks Environmental protection, certifications and protection of biodiversity: number of EU Ecolabel licenses and products International cooperation for environmental protection: scenario projections of CO₂eq emissions avoided, number of protected marine species (cetacean) <p>f. <u>Research:</u></p> <ul style="list-style-type: none"> number of projects financed, qualitative descriptions of the projects, environmental impact of research and development programmes in medium term (tonnes of CO₂eq avoided per year) 	
ESG Risk Management	<p>The Issuer has a multilevel approach to evaluate the expenditure items allocated based on the technical screening criteria of the EU Taxonomy (i.e., mitigation and adaptation to climate change), also including the other four objectives: sustainable use and protection of water and marine resources, transition towards a circular economy, prevention and reduction of pollution and protection and restoration of biodiversity and ecosystems. The exercise of simplified application of the EU Taxonomy is reported in the Green Allocation and Impact Report.</p> <p>Moverover, the Issuer confirms that the projects financed comply with the ESG management by examples of railway infrastructure and HS-HC lines investment, where the environmental design identified significant environmental aspects related to construction work and corresponding mitigation measures and environmental monitoring activities.</p>	✓
Allocation of proceeds - Transparency on the currency	Allocated proceeds have been reported in EUR. Projects on which proceeds have been allocated have been disclosed.	✓

RECOMMENDATIONS		
ICMA HFIR	BTP Green Allocation and Impact Report	ASSESSMENT
Define and disclose period and process for Project Evaluation and Selection	The entirety of proceeds has been allocated to Green Assets. The Issuer has also reported on the removed and added projects of the portfolio during the reporting period. The Issuer followed a transparent process for selection and evaluation of Eligible Green Projects. Projects financed and/or refinanced through the Green Bonds issued under Framework for the Issuance of Sovereign Green Bonds were evaluated and selected based on compliance with the Eligibility Criteria as laid out in the Framework except for the project fiscal incentives to improve building efficiency, called "Ecobonus".	✓
Disclose total amount of proceeds allocated to eligible disbursements	A total of EUR 7.94 billion has been raised through Issuer's Green Bond. All of the proceeds have been allocated to Green Assets.	✓
Formal internal process for the allocation of proceeds and to report on the allocation of proceeds	The Issuer followed a transparent process for the allocation of proceeds.	✓
Report at project or portfolio level	The BTP Green Allocation and Impact Report includes the total amount of proceeds allocated per eligible project category, project type within categories and per year of investment.	✓
Describe the approach to impact reporting	The Issuer identifies the specific project type within categories and clearly defines, for each project type, the total project's allocated proceeds.	✓
Report the estimated lifetime results and/or project economic life (in years)	The Issuer has reported the useful life for each type of intervention for Energy Efficiency.	✓
Ex-post verification of specific projects	The Issuer samples ex-post verification of Renewable Energy and Energy Efficiency projects and includes relevant methodologies, as well as results (tonnes of CO ₂ avoided annually) in the reporting.	✓
Report on at least a limited number of sector specific core indicators	The Republic of Italy reports on sector specific core indicators for most of the project types financed: <ul style="list-style-type: none"> Renewable Electricity and Heat: quantities of electricity involved (kWh) and tonnes of CO₂ avoided emissions Energy Efficiency: energy saving (GWh/y) and CO₂ avoided emissions Transport: tonnes of CO₂eq avoided per year, air pollutants (PM_{2.5}, NMVOC, SO₂, and NO_x) avoided and passenger traffic (millions of passenger-km), decrease in road traffic (million of vehicle-km/year) Pollution Prevention and Control, and Circular Economy: recycling rate, number of waste treatment plant per type, % of waste sent to landfills out of total regional municipal waste Protection of the Environment and Biological Diversity: hectares of wooded area, area (million hectares) and % of the territory, scenario projections of CO₂eq emissions avoided, number of protected marine species (cetacean) 	✓
If there is no single commonly-used standard, Issuers may follow and disclose their own calculation methodologies	The Issuer elaborated its own methodologies to calculate or estimate the impacts of the financed projects. The calculations are transparently disclosed in the BTP Green Allocation and Impact Report.	✓
Disclosure on the conversion approach (if applicable)	Where needed, the Issuer uses standard conversion factors and includes appropriate disclosure of the conversion approach in the report. These factors are taken from Italian nation-wide database by	✓

	Italian Institute for Environmental Protection and Research (ISPRA), e.g. National Inventory Report.	
Projects with partial eligibility	The project Fiscal incentives to improve building efficiency, called “Ecobonus”, does not meet the eligibility criteria set in the framework. The Issuer has transparently reported on the matter and the project can still be considered in line with the ICMA GBP.	✓
When the expected impacts of different project components may not be reported separately, Issuers may use (and disclose) the attribution approach	The impact of the Republic of Italy’s projects is reported separately per category and sub category on an aggregated basis.	-

OPINION

*The Republic of Italy **follows** Harmonised Framework for Impact Reporting (HFIR)’s core principles and key recommendations. The Issuer provides transparency on the level of expected reporting as well as on the frequency, scope and duration, aligned with best practices.*

PART III: DISCLOSURE OF PROCEEDS ALLOCATION AND SOUNDNESS OF THE IMPACT REPORTING INDICATORS

Use of Proceeds Allocation

Use of Proceeds allocation reporting is key to put the impacts into perspective with the number of investments allocated to the respective Use of Proceeds' categories.

The Use of Proceeds allocation reporting occurred on an annual basis from the issuance, after full allocation of the proceeds.

This is the second year of allocation reporting and 100% of the proceeds have been allocated in 2022. In 2022 the proceeds were 100% allocated and in September 2022 the Republic of Italy issued a new BTP Green with maturity April 2035. Use of Proceeds allocation reporting occurred within the regular annual cycle from the issuance.

Proceeds allocated to eligible projects/assets

The proceeds' allocation is broken down by the project category level, and by type of project. The Issuer has provided details about the type of projects included in the portfolio. The project categories eligible are Renewable Electricity and Heat, Energy Efficiency, Transport, Pollution Prevention and Control and Circular Economy, Protection of the Environment and Biological Diversity and Research. The proceeds are allocated to public agencies, public and private companies, local authorities, education and research institutes, and households.

The report provides information about projects which were removed from the allocation register, due to the risk of double counting for projects fed with resources from EU, or critics regarding monitoring and reporting.

The allocation report section of the BTP Green Allocation and Impact Report of The Republic of Italy aligns with best-market practices by providing information on:

- The number of projects (re)financed
- The total amount of proceeds in million euros (divided per project category, project type, expenditure year)
- Description of the projects (re)financed

Impact Reporting Indicators

The table below presents an independent assessment of the Republic of Italy's report and disclosure on the output, outcome, and/or impact of projects/assets using impact indicators.

ELEMENT	ASSESSMENT
Relevance	<p>The impact indicators chosen by the Issuer for this bond are the following:</p> <ol style="list-style-type: none"> <u>Renewable Electricity and Heat:</u> Fiscal incentives focused on the development of renewable and other low-carbon energies: number of users and quantities of electricity involved (kWh), and CO₂ avoided emissions <u>Energy Efficiency:</u> Fiscal incentives to improve building efficiency: CO₂ avoided emissions and energy saving (GWh/y). <u>Transport:</u> Incentives for rail freight transpiration: estimated increased use of rail for goods transportation, tonnes of CO₂eq avoided per year, air pollutants (PM_{2.5}, NMVOC, SO₂, and NO_x) avoided, and monetization of minor total externalities Subways: national endowment of urban and suburban railway infrastructure (km of network), passenger traffic (millions of passenger-km) Railway infrastructures and AV-AC lines: estimated future emissions avoided (tCO₂eq), and future air pollutants (PM_{2.5}, NO_x, NMVOC, SO₂) reduced (tons/year), decrease in road traffic (million of vehicle-km/ year), scrap materials management (m³ and % of material reused) <u>Pollution Prevention and Control, and Circular Economy:</u> Integrated Waste Cycle: recycling rate (measured as % recycled), number of waste treatment plant per type, % of waste sent to landfills out of total regional municipal waste. Soil pollution: number of sites surveyed for status of contamination Air pollution: improvement of % of Italian territory of air pollution (NO₂, ozone, PM₁₀, PM_{2.5}) average annual limit that is respected compared to 2013. Water pollution: volumes of litter stranded³³³, Clean Coast Index (CCI), quality of marine environment in terms of concentration of chlorophyll- phytoplankton and Posidonia Rapid Easy Index (PREI) index. <u>Protection of the Environment and Biological Diversity:</u> Water infrastructure: catchment area efficiency, number of residents without sewage service and purification service which could be mitigated; storage capacity of water resources in large dams (m³) Protected marine areas, national parks and state natural reserves: % protection coverage of key biodiversity area surveyed, hectares of wooded area, number of national parks and regional parks, and the respective area (million hectares) and % of the territory, number of protected marine areas (EUAP) and submerged parks, CO₂ avoided emissions³³⁴ Environmental protection, certifications and protection of biodiversity: number of EU Ecolabel licenses and products International cooperation for environmental protection: scenario projections of CO₂eq emissions avoided, number of protected marine species (cetacean) <u>Research:</u> Number of projects financed; qualitative descriptions of the projects, CO₂eq avoided per year

³³³ Calculated as litter of waste found per meter of beach.

³³⁴ Plants extract CO₂ from the atmosphere and store it in the leaves, trunks and stems and roots, on average a tree in a temperate climate located in the city can absorb between 10 and 30kg CO₂/year. Also, marine areas absorb carbon dioxide, with a global absorption capacity of approximately 25% of the CO₂ emitted annually by human activities.






	<p>These indicators are qualitative and material to the Use of Proceeds categories financed through the bonds and in line with the Suggested Impact Reporting metrics for Renewable Energy, Energy Efficiency, and Transport, by the ICMA Harmonized Framework for Impact Report. This aligns with best market practices.</p> <p>For the project categories Pollution Prevention and Control, and Circular Economy, Protection of the Environment and Biological Diversity, and Research the Republic of Italy has chosen alternative indicators to the ICMA Harmonized Framework for Impact Report.</p>
Data sourcing and methodologies of quantitative assessment	<p>For the impact indicators, the Republic of Italy uses internal methodologies and sourcing data from the Interministerial Committee³³⁵. This Committee is formed by 16 members from the Representatives of: Presidency of the Italian Council of Ministers; Ministry of Economy and Finance; Ministry of Infrastructure and Transport; Ministry of Environment and Energy Security; Ministry of Enterprises and Made in Italy; Ministry of Agriculture, Food Sovereignty and Forests; Ministry of University and Research; and Ministry of Culture. For data collection and data processing, the Ministries participating in the Committee collaborate with the structure of the Treasury Department at the Ministry of Economy and Finance.</p> <p>The data collection is carried out by the Institute for Environmental Protection and Research (ISPRA), that collect data through Agencies from the National System for the Protection of the Environment (SNPA), and the Copernicus Programme.</p> <p><u>Renewable energy and heat:</u> CO₂ avoided emissions (The emissions avoided are calculated in terms of the product of electricity generated from renewable sources by the average annual emission factor from fossil sources).</p> <p><u>Energy efficiency:</u> CO₂ avoided emissions (CO₂eq avoided during the period 2018-2020 which was when the measure was financed with the green bonds, to estimate the indicator data collected and published by ISPRA was used).</p> <p><u>Transport:</u> Incentives for rail freight transportation: estimated increased use of rail for goods transportation (comparing the use of rail before the STFM measure and after during the period 2014-2022). Tonnes of CO₂eq avoided per year (assuming a projection of traffic levels during 2021-2022 and calculating the emissions using the unitary rail-road differential of the average emission factors per tonne-km). Air pollutants (PM_{2.5}, NMVOC, SO₂, and NO_x) avoided (calculated multiplying the average emissions for the annual variations, estimated to decrease, of vehicle-km and tonne-km on the road, net of the pollution produced by rail transport). Monetization of minor total externalities (the monetization is calculated using a differential between rail and road equal to 3.1 €/tons.km, attributing environmental and social impacts).</p> <p><u>Subways:</u> national endowment of urban and suburban railway infrastructure (km of network of Italy compared to European peers), passenger traffic (millions of passenger-km during 2019-2021).</p> <p><u>Railway infrastructures and HS-HC lines:</u> estimated future emissions avoided (tCO₂eq) calculated as the difference between the climate-changing emissions avoided (deriving from the reduction of road, air and ship transport) and the climate-changing emissions generated by the increase in train circulation, and future air pollutants (PM_{2.5}, NO_x, NMVOC, SO₂) reduced (tons/year) (contribution deriving from the reduction in the circulation of vehicles on the road (cars, heavy vehicles and buses).</p> <p><u>Pollution Prevention and Control, and Circular Economy:</u> Integrated Waste Cycle: recycling rate (% recycled of industrial waste, packaging waste and urban waste), number of waste treatment plant per type, % of waste sent to landfills out of total regional municipal waste in 2 Air pollution: improvement of % of Italian territory of air pollution (NO₂, ozone, PM₁₀, PM_{2.5}) average annual limit that is respected compared to 2013.</p>

³³⁵ Interministerial Committee, [BTP Green Inter-Ministerial Committee - MEF Department of Treasury](#)

	<p>Water pollution: volumes of litter stranded (litter per meters of beach), Clean Coast Index (CCI), quality of marine environment in terms of concentration of chlorophyll-phytoplankton (the indicator is based on the estimate of phytoplankton biomass, providing a measure of the main photosynthetic pigment present in microalgae, as a proxy for the perturbations of the environmental quality of marine waters) and Posidonia Rapid Easy Index (PREI) index.</p> <p><u>Protection of the Environment and Biological Diversity:</u> Protected marine areas, national parks and state natural reserves: CO₂ avoided emissions (estimated by ISPRA in million tonnes by 2020 considering the conventions, programs and agreements implemented by Italy to prevent, control and reduced air pollution and greenhouse gas emissions), and km² of land and sea protected.</p> <p><u>Research:</u> Number of projects financed (estimated positive impact of research and development programs in reduction of CO₂ emissions and other climate-altering gases); qualitative descriptions of the projects.</p>
Baseline selection	Some impact indicators are compared to baseline data from processing of ENEA Report, report from the Ministry and ISPRA report. For Energy Efficiency, Transport, Pollution Prevention, and Protection of the Environment and Biological Diversity, baseline years 2018-2020, 2014-2022, 2013 and 2020 are used respectively. In this sense, the report is in line with the suggestion of the ICMA Harmonized Framework for Impact Reporting.
Scale and granularity	The impact data is presented at the Use of Proceed category level for the indicators.













High-level mapping of the impact indicators with the UN Sustainable Development Goals

Based on the project categories financed and refinanced by the bonds as disclosed in the Issuer's BTP Green Allocation and Impact Report, the impact indicator(s) adopted by the Republic of Italy for its Sovereign Green Bonds can be mapped to the following SDGs, according to the ICMA "A High-Level Mapping to the Sustainable Development Goals"³³⁶.










IMPACT INDICATORS	SUSTAINABLE DEVELOPMENT GOALS
<p><u>Renewable electricity and heat</u></p> <p><u>Fiscal incentives focused on the development of renewable and other low-carbon energies:</u></p> <ul style="list-style-type: none"> number of users quantities of electricity involved (KWh) CO₂ avoided emissions 	 
<p><u>Energy efficiency</u></p> <p><u>Fiscal incentives to improve building efficiency:</u></p> <ul style="list-style-type: none"> energy saving (GWh/y) CO₂ avoided emissions 	 
<p><u>Transport</u></p> <p><u>Incentives for rail freight transportation:</u></p> <ul style="list-style-type: none"> monetization of minor total externalities³³⁷ 	

³³⁶ ICMA's Mapping-SDGs-to-Green-Social-and-Sustainability-Bonds

³³⁷ The monetization is calculated using a differential between rail and road equal to 3.1 €/tons.km, attributing environmental and social impacts

<p><u>Transport</u></p> <p><u>Incentives for rail freight transportation:</u></p> <ul style="list-style-type: none"> tonnes of CO₂eq avoided per year estimated increased use of rail for goods transportation <p><u>Railway infrastructures and HS-HC lines:</u></p> <ul style="list-style-type: none"> estimated future emissions avoided (tCO₂eq) tonnes of CO₂eq reduced per year 	 
<p><u>Transport</u></p> <p><u>Subways:</u></p> <ul style="list-style-type: none"> national endowment of urban and suburban railway infrastructure (km of network) passenger traffic (millions of passenger-km) <p><u>Railway infrastructures and HS-HC lines:</u></p> <ul style="list-style-type: none"> passenger traffic (millions of passenger-km) 	  
<p><u>Transport</u></p> <p><u>Incentives for rail freight transportation:</u></p> <ul style="list-style-type: none"> air pollutants (PM_{2.5}, NMVOC, SO₂, and NO_x) avoided <p><u>Railway infrastructures and HS-HC lines:</u></p> <ul style="list-style-type: none"> future air pollutants (PM_{2.5}, NMVOC, SO₂, and NO_x) reduced (tons/year) 	 
<p><u>Transport</u></p> <p><u>Railway infrastructures and HS-HC lines:</u></p> <ul style="list-style-type: none"> scrap materials management (m³ and % of material reused) 	
<p><u>Pollution prevention and control, and circular economy</u></p> <p><u>Integrated Waste Cycle:</u></p> <ul style="list-style-type: none"> recycling rate³³⁸ number of waste treatment plants per type % of waste sent to landfills out of total regional municipal waste 	
<p><u>Pollution prevention and control, and circular economy</u></p> <p><u>Soil pollution:</u></p> <ul style="list-style-type: none"> number of sites surveyed for status of contamination 	
<p><u>Pollution prevention and control, and circular economy</u></p> <p><u>Air pollution:</u></p> <ul style="list-style-type: none"> improvement of air pollution with respect of average annual limit compared to 2013 	 

³³⁸ Calculated as % recycled of industrial waste, packaging waste and urban waste.

<p><u>Pollution prevention and control, and circular economy</u></p> <p><u>Water pollution:</u></p> <ul style="list-style-type: none"> volumes of litter stranded Clean Coast Index (CCI) quality of marine environmental in terms of concentration of chlorophyll-phytoplankton and PREI index (Posidonia Rapid Easy Index) 	
<p><u>Protection of the environment and biological diversity</u></p> <p><u>Protected marine areas, national parks and state natural reserves:</u></p> <ul style="list-style-type: none"> CO₂ avoided emissions 	
<p><u>Protection of the environment and biological diversity</u></p> <p><u>Protected marine areas, national parks and state natural reserves:</u></p> <ul style="list-style-type: none"> % protection coverage of key biodiversity area surveyed number of protected marine areas (EUAP) and submerged parks 	
<p><u>Protection of the environment and biological diversity</u></p> <p><u>Protected marine areas, national parks and state natural reserves:</u></p> <ul style="list-style-type: none"> hectares of wooded area number of national parks and regional parks, and the respective area (million hectares), % of the territory 	
<p><u>Protection of the environment and biological diversity</u></p> <p><u>Water infrastructure:</u></p> <ul style="list-style-type: none"> storage capacity of water resources in large dams (m³) number of residents without sewage service and purification service which could be mitigated. 	
<p><u>Protection of the environment and biological diversity</u></p> <p><u>International cooperation for environmental protection:</u></p> <ul style="list-style-type: none"> number of protected marine species (cetacean) 	
<p><u>Protection of the environment and biological diversity</u></p> <p><u>Environmental protection, certifications and protection of biodiversity:</u></p> <ul style="list-style-type: none"> number of EU Ecolabel licenses and products 	
<p><u>Research</u></p> <ul style="list-style-type: none"> environmental impact of research and development programmes (tonnes of CO₂eq avoided per year) 	
<p><u>Research</u></p> <ul style="list-style-type: none"> number of projects financed 	

OPINION

The allocation of the bond's proceeds has been disclosed, with a detailed breakdown across different eligible project categories/asset categories as proposed in the Framework and the Republic of Italy's Framework for the Issuance of Sovereign Green Bonds has adopted an appropriate methodology to report the impact generated by providing comprehensive disclosure on data sourcing, calculations methodologies and granularity reflecting best market practices. Besides, the impact indicators used align with best market practices using ICMA's recommended metrics, in the HFIR.

DISCLAIMER

1. Validity of the Report Review ("Report Review"): As long as no changes are undertaken by the Issuer to its BTP Green Allocation and Impact Report as of June 14, 2023.
2. ISS Corporate Solutions, Inc. ("ICS"), a wholly-owned subsidiary of Institutional Shareholder Services Inc. ("ISS"), sells/distributes Report Reviews which are prepared and issued by ISS ESG, the responsible investment arm of ISS, on the basis of ISS ESG's proprietary methodology. In doing so, ISS adheres to standardized procedures to ensure consistent quality of responsibility research worldwide. Information on ISS's methodology is available upon request.
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ANNEX 1: Methodology

Review of the post-issuance Reports

The report review of post-issuance reports provides the Issuer with an independent opinion on the soundness of its post-issuance report and of its alignment with recognized market guidelines and it provides investors with independent information regarding the reliability of the report produced. On the basis of the information provided by the Issuer, the alignment of the report is assessed with recognized market guidelines, the metrics chosen by the Issuer and the soundness of process and methodology of reporting. The metrics are analyzed based on specific sets of indicators using proprietary method referring to common market guidelines.

High-level mapping to the SDG

The 17 Sustainable Development Goals (SDGs) were endorsed in September 2015 by the United Nations and provide a benchmark for key opportunities and challenges toward a more sustainable future. Using a proprietary method based on ICMA's Green, Social and Sustainability Bonds: A High-Level Mapping to the Sustainable Development Goals, the extent to which the Issuers reporting and project categories contribute to related SDGs is identified.

ANNEX 2: Quality management processes

SCOPE

The Republic of Italy commissioned ICS to compile a Report Review on its Bond Report. The Report Review process includes verifying whether the Bond Report aligns with the Issuer's Green, Social and Sustainability Bond Framework and the respective market standards, i.e. the Green Bond Principles, Social Bond Principles and Sustainability Bond Guidelines and to assess the robustness and completeness of the reporting methodologies.

CRITERIA

Relevant Standards for this Report Review:

- ICMA Green Bond Principles
- ICMA Harmonized Framework for Impact Reporting
- ICMA A High -Level Mapping to the Sustainable Development Goals

ISSUER'S RESPONSIBILITY

Issuer's responsibility was to provide information and documentation on:

- BTP Green Allocation and Impact Report
- Framework for the Issuance of Sovereign Green Bonds (as of February 25, 2021)
- Proceeds Allocation
- Reporting Impact Indicators
- Methodologies, and assumptions for data gathering and calculation
- ESG Risk Management

ISS ESG's VERIFICATION PROCESS

ISS ESG is one of the world's leading independent environmental, social and governance (ESG) research, analysis and rating houses. The company has been actively involved in the sustainable capital markets for over 25 years. Since 2014, ISS ESG has built up a reputation as a highly-reputed thought leader in the green and social bond market and has become one of the first CBI approved verifiers.

This independent Report Review has been conducted by following the ICMA Guidelines for Green, Social, Sustainability and Sustainability-Linked Bonds External Reviews, and its methodology, considering, when relevant, the ISAE 3000 (Revised), Assurance Engagements Other than Audits or Reviews of Historical Financial Information.

The engagement with the Republic of Italy took place in May and June 2023.

ISS' BUSINESS PRACTICES

ISS has conducted this verification in strict compliance with the ISS Code of Ethics, which lays out detailed requirements in integrity, transparency, professional competence and due care, professional behaviour and objectivity for the ISS business and team members. It is designed to ensure that the verification is conducted independently and without any conflicts of interest with other parts of the ISS Group.

About this Report Review

ISS ESG is one of the world's leading rating agencies in the field of sustainable investment. The agency analyzes companies and countries regarding their environmental and social performance. We assess alignment with external principles (e.g. the ICMA Green Bond Principles, Social Bond Principles and Sustainable Bond Guidelines), analyze the sustainability quality of the assets and review the sustainability performance of the Issuer themselves. Following these three steps, we draw up an independent Report Review so that investors are as well informed as possible about the quality of the bond/loan from a sustainability perspective.

Learn more:

<https://www.isscorporatesolutions.com/solutions/esg-solutions/green-bond-services/>

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