2022 INTEGRATED REPORT

BONDALTI

04

Planet

Planet

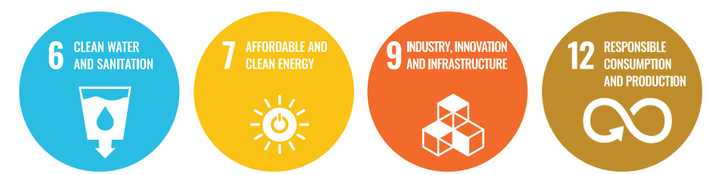
Renewable sources account for **17%** of the energy used

Installation of **2 MWh** capacity solar park

1 061 GJ of natural gas is saved

+9% reduction in waste generation

Strategic SDGs:



Impacted SDGs:

Environmental Protection, Emissions and Energy Management are at the top of Bondalti's priorities as contributions to a neutral impact society and towards the achievement of climate neutrality.

In order to meet the general requiements of the chemical industry, Bondalti is constantly looking for new technologies for waste recovery, and capture and use of carbon dioxide, and it provides essential products to promote energy efficiency and new forms of sustainable mobility.

To this end, in 2020, Bondalti defined its Climate Transition Programme, whereby it commits to the challenge of transformation, in line with the long-term strategy defined by the EU towards a carbon neutral and more responsible business in terms of environmental impact.

It should be noted that Bondalti Chemicals is member of EuroChlor since its foundation in 1989, having adhered in 2013 to the Euro Chlor Safety Commitment guidelines, which aim to guide the chlor-alkali industry towards a responsible and sustainable future.

04. **Planet**

Climate Transition

Bondalti is committed to achieving carbon neutrality by 2030. To this end, it developed a Climate Transition Strategy that is annually reviewed and improved so as to meet the best practices in the sector and work towards an efficient and fair Energy and Climate Transition. Bondalti is currently developing an extensive and detailed plan to implement this strategy.

Bondalti is included in the sectors that operate in the European Emissions Trading Scheme - EETS. This is a regulated market for the transfer of carbon emission allowances.

For instance, Bondalti has very low nitric acid emissions because in 2010/2011 the company built a new plant equipped with emerging technology to reduce N_2O. As a result, we are at the top of the least polluting companies at European level.

The new voluntary carbon market that is envisaged for Portugal could become a relevant mechanism for the most efficient organisations that intend to capitalize on their investments and decarbonization projects and, on the other hand, buy credits associated with carbon sequestration projects, in case they need to offset unavoidable emissions or even intend to bet on a carbon negative ambition.

On the other hand, there are financial mechanisms, such as Green bonds, Social Bonds or Sustainability-linked bonds that can be placed privately or publicly.

Bondalti assesses all these mechanisms continuously with a view to updating and improving its Climate Transition Strategy. We believe that the best strategy is the one that adds a diverse set of solutions and tools at the following levels:

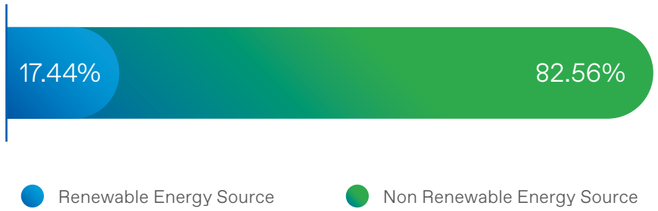
1. Technological innovation and digitisation
2. Reduced consumption and increased efficiency
3. Decarbonisation of energy sources
4. Carbon capture, use and storage
5. Carbon off-setting using nature-based solutions
6. Development of partnerships for innovation in sustainability and climate action
7. Compliance with due diligence at the level of value chains to reduce Scope 3 emissions and achieve the alignment of partners and suppliers with the decarbonization strategy and compliance with the targets established in the Paris Agreement
8. Reporting and Compliance in accordance with applicable EU regulations and international best ESG data disclosure practices
9. Financial mechanisms to support mitigation projects, boost investment, review financing conditions and debt restructuring
10. Engagement of all stakeholders to gain scale and increase awareness to individual contribution

Energy

Bondalti's energy consumption is directly related to production: in Industrial Chemicals, the PCA sector uses electricity as a raw material while the PAD sector uses natural gas to produce steam. In the Water Treatment business, energy use has a much smaller impact and is mainly associated with lighting or the use of vehicles.

As a result, in Industrial Chemicals, energy management is planned and monitored in detail, and there are several projects and initiatives underway viewing the continuous optimisation of processes and operations for energy efficiency.

Total Energy Used



In Industrial Chemicals, energy consumption amounts to a total of 3,103,135 GJ, while in the Water Treatment sector the total is 9,559 GJ.

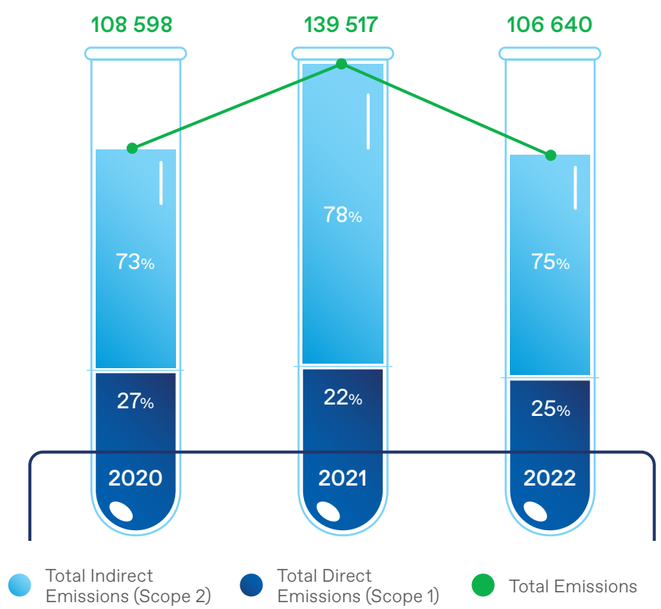
Following the installation of the two 2 MWh solar parks at the Estarreja production unit, Bondalti began to use electricity from renewable sources, presently accounting for 17% of total energy used.

GHG (Greenhouse Gas) Emissions

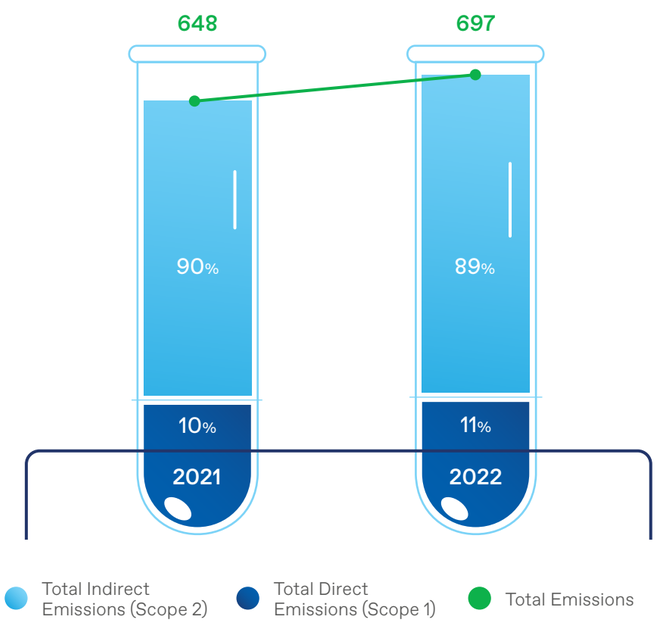
Greenhouse Gas (GHG) emissions are monitored at the various Bondalti companies, thus ensuring alignment with carbon neutrality.

In the Industrial Chemicals activity sector, direct emissions produced are the result of the consumption of natural gas for the production of steam in boilers, burning of waste in the incinerator and production of nitric acid. Indirect emissions are determined by electricity consumption, through the CO_2 emission factor associated with respective power supplier. Bondalti manages its emissions on an ongoing basis, with a focus on continuous improvement, investing in projects to reduce them.

Direct and Indirect GHG Emissions in Industrial Chemicals
(t CO_2 eq.)

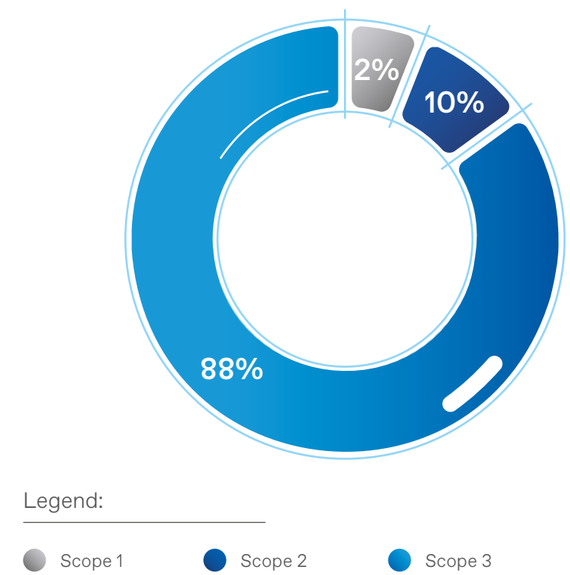


Direct and Indirect GHG Emissions in Water Treatment
(t CO_2 eq.)



In addition to scope 1 and 2 emissions, in 2022 Bondalti determined scope 3 emissions for categories 1 (Goods and Services), 3 (Fuel and Energy), 6 (Commuting) and 10 (Processing of Sold Products) of the last 3 years. In 2022, Scope 3 emissions account for approximately 88% of Bondalti's total GHG emissions.

Total GHG emissions in Industrial Chemicals



Scope 3 Emissions in Industrial Chemicals (t CO_2eq)	2020	2021	2022	Δ (abs)	Δ (%)
Goods and Services	465 128	585 374	546 863	14 408	3%
Fuels and Energy	16 785	17 700	17 708	310	2%
Missions	24	29	147	81	122%
Processing of Products Sold	539 756	569 115	402 327	-101 405	-20%

To calculate the variation, the difference between 2022 was determined by the three-year average.

GHG emissions in Industrial Chemicals	2020	2021	2022	Δ (abs)	Δ (%)
Scope 1 Emissions (t CO_2eq)	29 069	30 373	27 069	- 17 68	- 6%
Scope 2 Emissions (t CO_2eq)	79 529	109 144	79 570	- 9 844	- 11%
Scope 3 Emissions (t CO_2eq)	1 021 693	1 172 217	967 045	-86 606	-8%
Total	**1 130 290**	**1 311 733**	**1 073 685**	**-98 218**	**-8%**

To calculate the variation, the difference between 2022 was determined by the three-year average.

GHG emissions in Water Treatment	2021	2022	Δ (abs)	Δ (%)
Scope 1 Emissions (t CO_2eq)	584	623	19	3%
Scope 2 Emissions (t CO_2eq)	64	74	5	7%
Scope 3 Emissions (t CO_2eq)	-	-	-	-
Total	**648**	**697**	**24**	**4%**

To calculate the variation, the difference between 2022 was determined by the three-year average.

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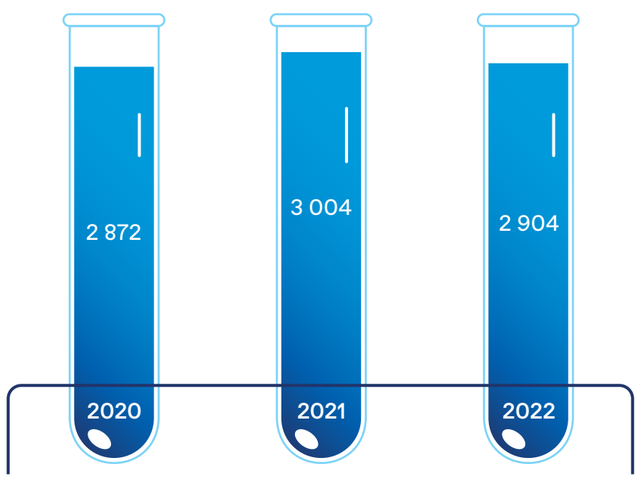
Water management

In Bondalti Chemistry's activity, water is used for the purposes as raw material in the production process, thus requiring a careful management. Conversely, the use of water in the Water Treatment business is on a very small scale, namely for human consumption and equipment testing.

In 2022, water consumption was directly proportional to production. In Estarreja, the water used in the Industrial Chemicals processes comes from the Antuã river, while in Cantabria it comes from Solvay facilities. All water used in Bondalti's Water Treatment business comes from the public network.

Total Water withdrawn from Industrial Chemicals (ML)



Bondalti Cantabria managed to save 25% in water consumption over its annual production thanks to working improvements, which made stoppages and the washing of electrolysers unnecessary.

In Bondalti's Water Treatment companies, the water used in the facilities comes from the public network and is essentially used for human consumption, therefore, consumption is quite low compared to Industrial Chemicals. In this business area, extracted water is also used in an industrial environment for testing equipment.

The correct management of liquid effluents is also considered a very relevant issue. Effluent emissions in the Bondalti's Water Treatment business are insignificant, however, the same is not true in the Industrial Chemicals business. In all Bondalti's business units and geographies, water is sent to third-party water treatment plants.

In overall terms, there was an increase in the discharge of water (brine) due to the increase in production in Bondalti Cantabria. The brine is sent to Solvay's water treatment plant, after being subject to a first treatment at Bondalti's facilities.

04. Planet

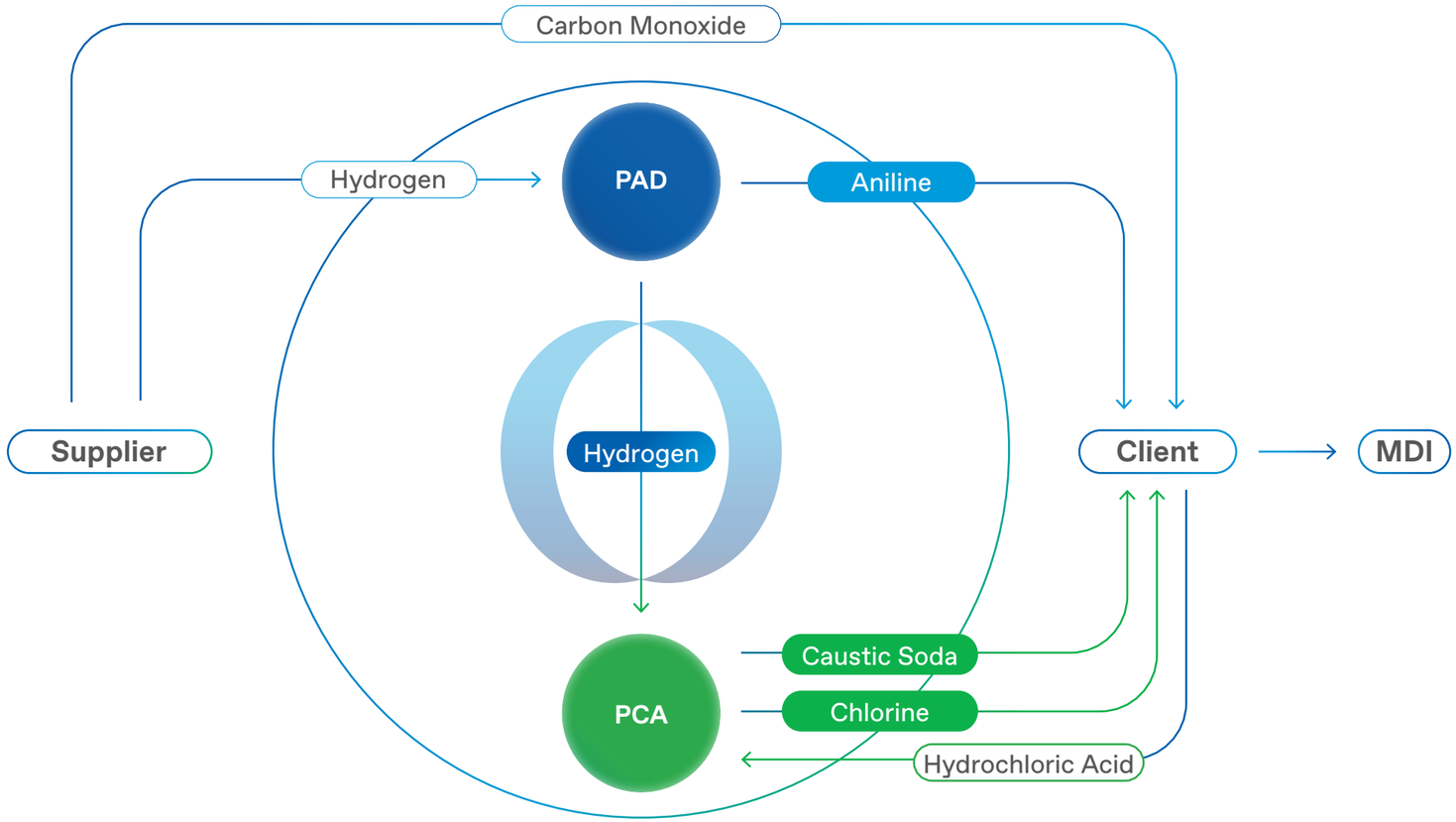
Circular Economy

Bondalti invests in transforming its processes towards an increasingly circular model with a view to optimising the use of raw materials, water and energy resources.

As part of the circularity of raw materials, Bondalti has maximised the use of hydrogen from the chlor-alkali production unit and recovering the ammonia produced. Bondalti has developed several projects to optimise its water resources, such as the reuse of hot water from the reactors, the reuse of water currently sent for treatment, or the development of a systematic analysis to map industrial water networks, further assessing industrial water/wastewater savings opportunities and timely tracking deviations from the desired target.

With regard to energy efficiency and the reduction of greenhouse gas emissions, Bondalti has invested in projects such as reaction heat recovery (reducing steam consumption) and energy recovery from effluents (reducing natural gas consumption).

Bondalti is part of the CQE, where Circular Economy principles are followed since several years.



Bondalti Operations

With a view to improving its processes and taking advantage of industrial synergies, Bondalti continuously invests and seeks Circular Economy opportunities to implement in its production, to make it more effective, efficient and environmentally responsible.

Waste Management

During the year, Bondalti's activities were responsible for generating around 17 thousand tons of waste, around 9.6% less compared to 2021.

Industrial Chemicals (t)	2020	2021	2022	Δ (abs)	Δ (%)
Hazardous waste	18 557	18 343	16 592	- 1 239	- 7%
Recycled	337	176	365	72	25%
Other type of recovery	0	3	87	57	188%
Incinerated	17 772	17 520	15 222	- 1 616	- 10%
Landfill	353	292	831	339	69%
Other type of deposition	95	352	87	- 91	- 51%
Non-hazardous waste	277	292	470	124	36%
Recycled	234	212	425	135	46%
Other type of recovery	0	57	45	11	33%
Incinerated	0	0	0	0	0%
Landfill	25	23	0	- 16	- 98%
Other type of deposition	18	0	0	- 6	- 100%
Total waste produced	**18 834**	**18 635**	**17 062**	**- 1 115**	**- 6%**

Bondalti Capital's waste (comparable municipal waste) is not included due to its small size. To calculate the variation, the difference between 2022 was determined by the three-year average.

Water Treatment (t)	2021	2022	Δ (abs)	Δ (%)
Hazardous waste	15.5	11.9	- 1.8	- 13%
Recycled	14.4	9.5	- 2.5	- 13%
Other type of recovery	0.2	1.1	0.5	75%
Incinerated	0.0	0.0	0.0	0%
Landfill	1.0	1.2	0.1	13%
Other type of deposition	0.0	0.0	0.0	0%
Non-hazardous waste	36.6	31.2	- 2.7	- 8%
Recycled	6.8	8.9	1.0	13%
Other type of recovery	6.6	4.0	- 1.3	- 25%
Incinerated	9.7	4.5	- 2.6	- 36%
Landfill	13.5	13.9	0.2	- 1%
Other type of deposition	0.0	0.0	0.0	0%
Total waste produced	**52.2**	**43.1**	**- 4.5**	**- 10%**

To calculate the variation, the difference between 2022 was determined by the three-year average.

The decrease in waste is due to the general shutdown that took place in the first quarter of the year and, consequently, to a decrease in production.

In 2022, Bondalti started to send part of its waste for recycling, its recycling rate presently standing at 5%. In 2022, Bondalti improved the percentage of recycled waste from 2% to 5%, compared to the previous year.

The high percentage of incinerated waste is mainly due to their nature. The waste essentially comes from four sources: gaseous effluents, nitrophenols and carbonates from MNB production and effluents from aniline production.

With regard to the gaseous effluent from the production of MNB, the emission of this effluent occurs continuously, so its treatment has to be carried out downstream of the facilities. As for the remaining effluents, given their volume and hazardousness, Bondalti incinerates the waste locally holding incineration licenses for the purpose.

04. Planet

Promotion of Biodiversity

Biodiversity is life. It is the set of all life forms that make up the genetic capital of our planet allowing for balanced relationships between living organisms, including humans, and their physical environment.

Humanity has always benefited from and depended on biodiversity and will always do. Many technologies and equipment derive directly from the knowledge that Man has of Nature - which allows using many biodiversity related services and products for own benefit.

Every 1 Euro invested into nature restoration adds €8 to €38 in benefits

(Source: The EU #NatureRestoration Law (europa.eu))

Despite the importance that biodiversity has for our Planet and Humanity, the risks that threaten it are ever greater. The Global Living Planet Report 2020, published by the World Wide Fund for Nature (WWF), shows an average 68% decrease in population sizes of mammals, birds, amphibians, reptiles and fish over the last 50 years – a decrease only comparable to previous events of mass extinction. This combined with the destruction of the most biodiverse habitats, such as tropical forests or wetlands.

In the European Union more than 80% of natural habitats are considered at "poor" level and one in three species of bees and butterflies is in decline.

Hence, the participants of the last Biodiversity Conference (COP15) agreed to preserve 30% of the most threatened ecosystems on the planet to defend the rights of indigenous peoples and to invest 30 billion dollars in nature conservation by 2030.

In May 2020, the European Commission established the European Biodiversity Strategy 2030. This is a comprehensive, ambitious and long-term plan to protect nature and reverse the process of ecosystem degradation, which aims to put Europe's biodiversity on a recovery path by 2030. The strategy establishes specific actions and commitments. In terms of nature protection, the European Commission assumes the following main commitments until 2030:

1. Legally protect a minimum of 30% of the EU land area and 30% of the EU's sea area and integrate ecological corridors, as part of a coherent, transnational network.
2. Strictly protect at least a third of the EU's protected areas, including all remaining EU primary and old- growth forests
3. Effectively manage all protected areas, defining clear conservation objectives and measures, and monitoring them appropriately.

Implications of applying EUBS2030:

Farmland

A quarter of farmland should be under organic farming management by 2030 and pesticide use and risk should be reduced by 50%, as well as the use of the most dangerous/ hazardous pesticides.

Forests

The EU biodiversity strategy for 2030 commits to planting at least 3 billion additional trees in the EU by 2030, i.e. doubling the current trend.

Pollution and soils

EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil' addresses in particular the prevention and remedy of soil contamination. The use of fertilizers must be reduced at least by 20% by 2030.

Marine ecosystems

Reinforce the protection of marine ecosystems and restore them to achieve "good environmental status", namely through the expansion of protected areas and the creation of strictly protected areas for the recovery of habitats and fish populations.

Freshwater ecosystems

At least 25,000 km of rivers will be restored into free-flowing rivers, through the removal of barriers and the restoration of floodplains.

Cities and local governments

New Green City agreement - the promotion of healthy ecosystems, green infrastructure and nature-based solutions must be systematically integrated into urban planning, including the design of buildings, public spaces and infrastructure.

Invasive alien species

New effort to implement the Invasive Alien Species Regulation in order to reduce by 50% the number of species on the Red List threatened by invasive alien species.

With the aim of putting the EU in a global leadership position in tackling the global biodiversity crisis, €20 billion a year will be unlocked for biodiversity through various sources, including EU funds and national and private funding. Natural capital and biodiversity considerations will be integrated into business practices.

In May 2022, the "Biodiversity 2030: New Agenda for Conservation in the Context of Climate Change" study, commissioned by Ministry for Environment and Climate Action aligned with EUBS2030 was published in Portugal.

This study responds to the challenge of reflecting about Portugal's biodiversity policy until for 2030, considering, in particular, aspects related to the binomials biodiversity-climate, -territory, -inland and coastal waters, -ocean, and -people.

In June 2022, the European Commission adopted a proposal for a Nature Restoration Law, which is considered a key element of the EU Biodiversity Strategy (EUBS2030).

Restoring wetlands, rivers, forests, grasslands, marine ecosystems, and the species they host will help:

- increase biodiversity; secure the things nature does for free, like cleaning our water and air, pollinating crops, and protecting us from floods;
- limit global warming to 1.5°C;
- build up Europe's resilience and strategic autonomy, preventing natural disasters and reducing risks to food security.

The proposal contains the following specific targets:

- targets based on existing legislation (for wetlands, forests, grasslands, river and lakes, heath & scrub, rocky habitats and dunes) - improving and re-establishing biodiverse habitats on a large scale, and bringing back species populations by improving and enlarging their habitats
- pollinating insects – reversing the decline of pollinator populations by 2030, and achieving an increasing trend for pollinator populations, with a methodology for regular monitoring of pollinators
- forest ecosystems – achieving an increasing trend for standing and lying deadwood, uneven aged forests, forest connectivity, abundance of common forest birds and stock of organic carbon
- urban ecosystems – no net loss of green urban space by 2030, and an increase in the total area covered by green urban space by 2040 and 2050
- agricultural ecosystems – increasing grassland butterflies and farmland birds, the stock of organic carbon in cropland mineral soils, and the share of agricultural land with high-diversity landscape features; restoring drained peatlands under agricultural use
- marine ecosystems – restoring marine habitats such as seagrass beds or sediment bottoms that deliver significant benefits, including for climate change mitigation, and restoring the habitats of iconic marine species such as dolphins and porpoises, sharks and seabirds.
- river connectivity – identifying and removing barriers that prevent the connectivity of surface waters, so that at least 25 000 km of rivers are restored to a free-flowing state by 2030.

In the face of such challenge, Bondalti has embraced various Nature Conservation and Scientific Research projects, covering several protected species from different ecosystems and geographies. From the endangered Iberian lynxes and imperial eagles in the southern border between Portugal and Spain, protecting their prey and the Mediterranean forest; to the brown bears that still survive in the Cantabrian mountain range, in the north of the Iberian Peninsula. From Marine animals that wash up on the Portuguese coasts, whether birds, seals, reptiles or dolphins; to the shorebirds that nest or seek shelter in the main Portuguese wetlands before their long-term migrations to Africa or northern Europe, often close to the Arctic Circle.

Life and biodiversity must be protected and it is everyone's responsibility to promote its preservation for future generations.

As an environmentally responsible company, Bondalti is committed to promoting the balance of ecosystems, and involved in and providing support to worthy biodiversity projects.

Bondalti protects marine life

Bondalti is a partner of Ecomare, Marine Animal Recovery Centre – providing support to the rescue, recovery and return to nature of dolphins, seals, turtles and seabirds that wash up on our coasts. Within the scope of this project, Bondalti and the University of Aveiro signed a protocol in December 2016, with the purpose of establishing the Organisation's continuous support to Ecomare, namely by donating hypochlorite (one of the main products in the Industrial Chemicals segment) that is required to maintain the water quality of the tanks where the rescued animals temporarily live.

Bondalti's protection of Biodiversity

Perditos Habitat

In 2017 Bondalti established a partnership protocol with the ANPC (National Association of Rural Owners), with the aim of supporting the recovery of high conservation value habitats for threatened Iberian lynxes and imperial eagles.

The project, which is located in Vale de Perditos, has the support of Bondalti and contributes to the recovery of 3,000 hectares of different habitats in the Guadiana valley region. The species benefiting from this project are top predators of Mediterranean ecosystems, functioning as excellent bioindicators of the quality of rural and natural areas; their presence is evidence of the existence of good management and adequate conditions for a wide variety of other species, on which these superpredators depend. The year 2022 was the last year of the second consecutive three-year period of support for this project, which has total funding provided by Bondalti of € 760,000 spread over 6 years, for the multifunctional management of an area of approximately 3,000 hectares. On February 22, Vale de Perditos received a couple of Iberian lynxes born at the Silves Reproduction Centre. The protocol is expected to be renewed for another three years in 2023.

This project made it possible to obtain real and innovative results (with the granting of a PhD scholarship and permanent hiring of a researcher, PhD student and a laboratory technician for development and research within the scope of this project). In addition, the project contributed to the supply and use of a new LoRa technological system.

LoRa, short for "long range", is a long-range, low-power wireless radio frequency technology. LoRa devices allow IoT (internet of things) applications to act to solve some of the biggest challenges that modern society faces, such as reducing the use of natural resources, controlling pollution in large centres or preventing disasters, among many other uses. They are now an essential tool in Habitat Perditos, helping the capture effort, minimizing the discomfort of captured wild species and contributing to their well-being.

The almost six years of the Habitat Perditos project, and the studies carried out there by CIBIO teams, were decisive for the recent creation of the Mértola Biological Station, managed by CIBIO/BIOPOLIS - whose main objective is to support research in the fields of biodiversity, agroecology and management of wild and game resources.

Still within the scope of the Habitat Perditos project, Bondalti is providing support and funding a Guest Chair in the fields of Game and Biodiversity. This Chair will have as major objectives the investigation into the ecology, demography and health of sedentary smaller game species, namely the red partridge, the Iberian rabbit and the Iberian hare, preferred prey of the Iberian lynx and the Imperial Eagle, as well as the assessment of the impact of game management on biodiversity. The research team of the Game and Biodiversity Chair will have the support of the Mértola Biological Station.

As a result of the scientific works led by CIBIO, a pilot research project on the red partridge viruses was started last year in Vale de Perditos; the project is approved by the FCT, and is being developed by researcher João Queiroz. A PhD scholarship, financed by the FCT, is under way, on issues related to the health of the red partridge and the interface with other bird species occurring in the Habitat Perditos territory.

In the year just ended, tests were started with new traps to capture mosquitoes that are vectors of the disease and which are subsequently identified by metagenomic techniques.