

# MY PLANET

*by The Navigator Company*



Navigator: growth with a purpose

**“We are inspired and moved by people, their quality of life and, above all, the future of our planet.”**



### **António Redondo, CEO, interviewed**

Supporting well-managed production forests is the key to maximising the role of forests in society.

The new range of packaging papers is a practical example of our From Fossil to Forest strategy.

The Navigator Company is a bioindustry on the right side of the future.

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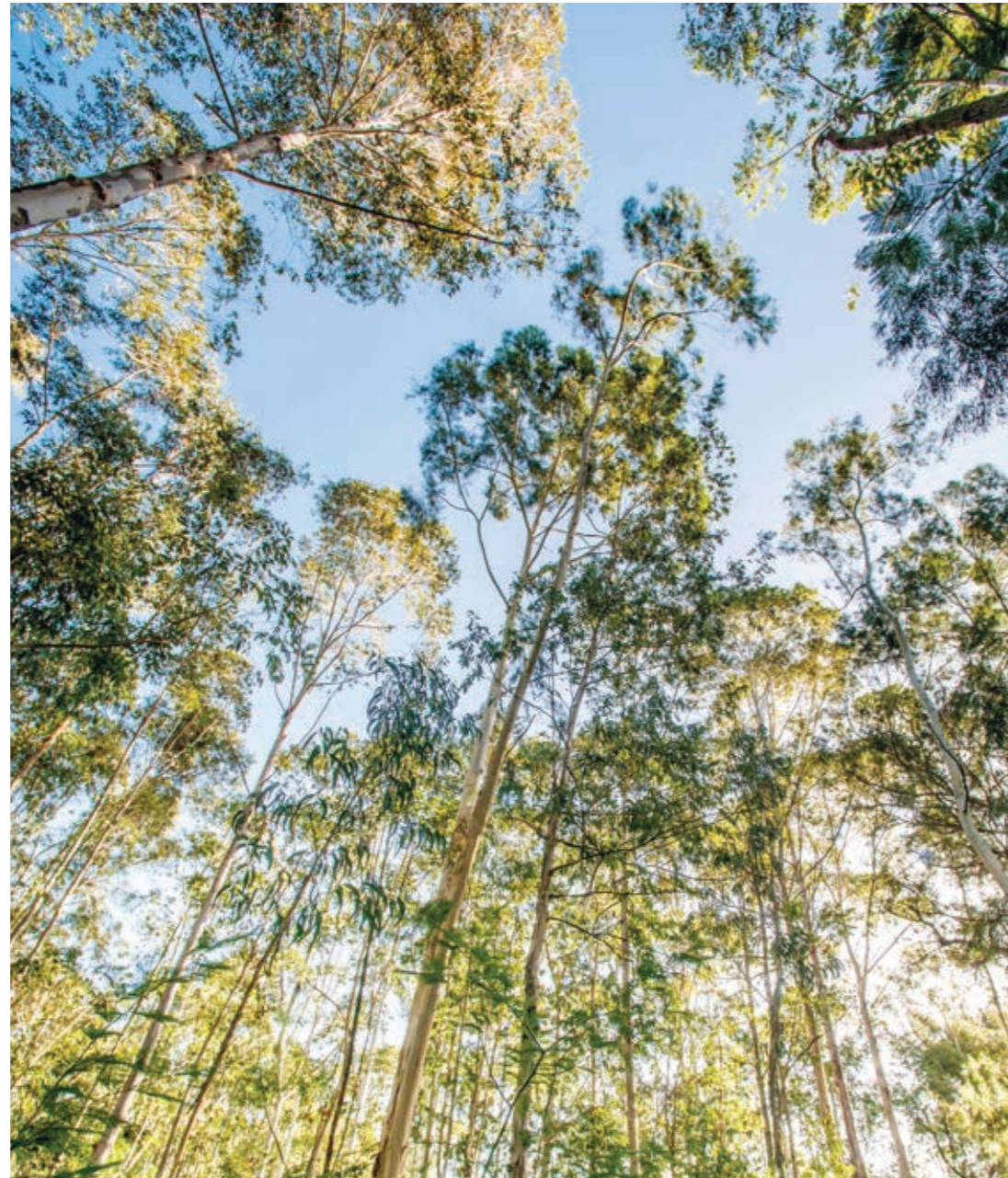
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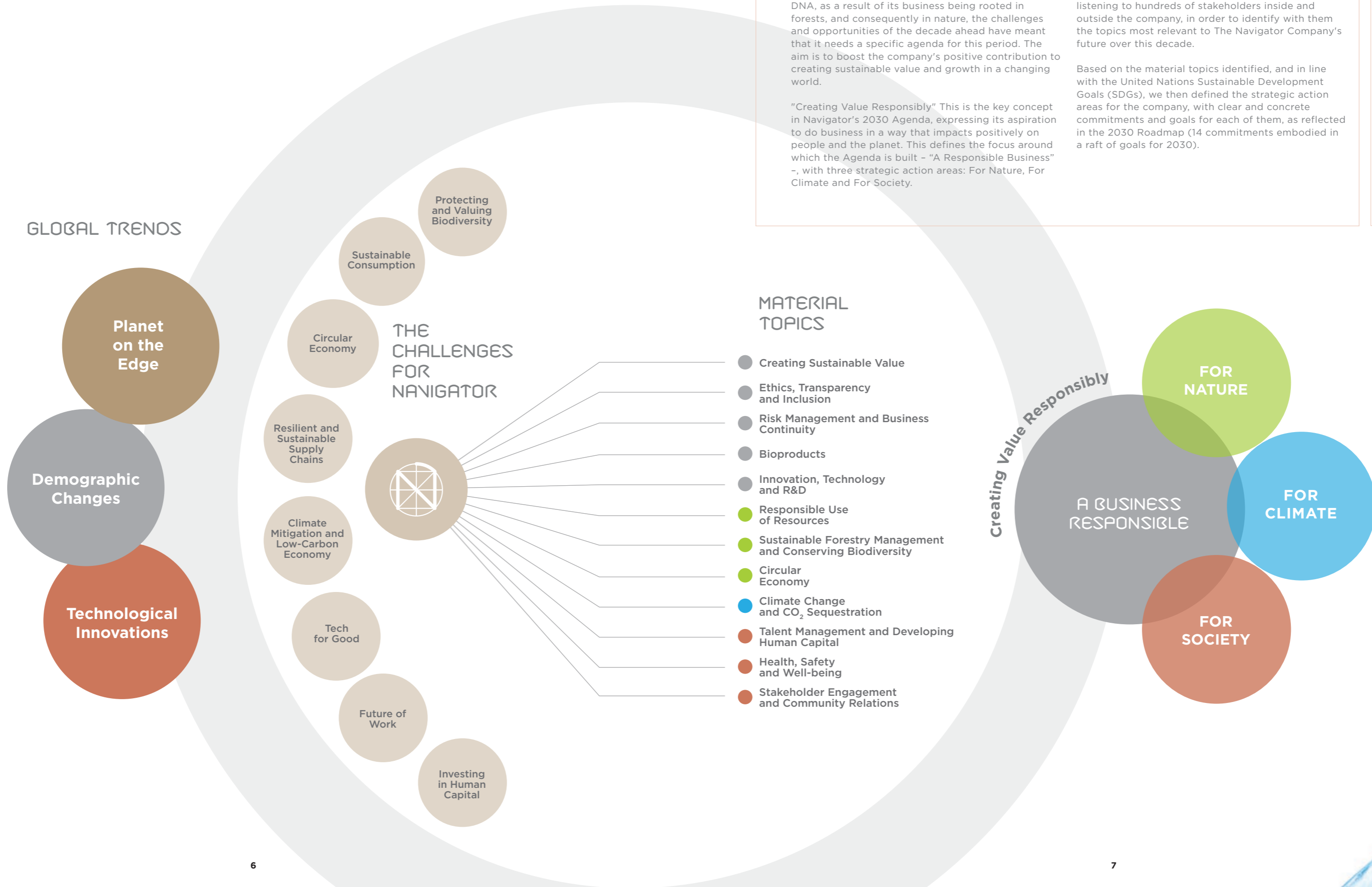
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# Ten years to help change the world

The world is changing fast and the search for a future that is fairer, more inclusive and more sustainable is one of the greatest challenges in our history. How can a company contribute to this collective endeavour? How can it do more to create sustainable value and growth? In a drive to mobilise people across the organisation, The Navigator Company has asked itself these questions, encouraged debate and listened to internal and external stakeholders. The result, which we report in this edition, is the Responsible Management Agenda for 2020-2030, a strategic frame of reference aligned with the United Nations Sustainable Development Goals and based on a key concept: "Creating value responsibly". In its corporate purpose, The Navigator Company explains that "we are inspired and moved by people, their quality of life and, above all, the future of our planet". The 2030 Agenda reflects this commitment and understanding of itself as a "company that takes on the challenge of asking each day what it can do to create a better world".

# What The Navigator Company's 2030 Agenda means



**N**avigator's 2030 Agenda reflects its alignment with wider global trends towards sustainability, providing a management blueprint for the United Nations Decade of Action. This agenda has grown out of Navigator's Responsible Business Management Strategy.

Although sustainability is already part of Navigator's DNA, as a result of its business being rooted in forests, and consequently in nature, the challenges and opportunities of the decade ahead have meant that it needs a specific agenda for this period. The aim is to boost the company's positive contribution to creating sustainable value and growth in a changing world.

"Creating Value Responsibly" This is the key concept in Navigator's 2030 Agenda, expressing its aspiration to do business in a way that impacts positively on people and the planet. This defines the focus around which the Agenda is built - "A Responsible Business" -, with three strategic action areas: For Nature, For Climate and For Society.

Over the next few pages, we take a closer look at this Agenda, which was put together by first researching global trends and the main challenges to stewarding our business. We also considered the Environmental, Social and Governance risks (ESG risks, used to assess the sustainability performance of organisations and how they create sustainable value) as well as the opportunities for our company. Alongside this, we embarked on a materiality analysis that entailed listening to hundreds of stakeholders inside and outside the company, in order to identify with them the topics most relevant to The Navigator Company's future over this decade.

Based on the material topics identified, and in line with the United Nations Sustainable Development Goals (SDGs), we then defined the strategic action areas for the company, with clear and concrete commitments and goals for each of them, as reflected in the 2030 Roadmap (14 commitments embodied in a raft of goals for 2030).

The Navigator Company's Responsible Management Strategy is based on Ethics, Responsibility and Transparency. The company is responsible for forest-based products that contribute to sustainable development and to society's well-being, in alignment with the United Nations Agenda 2030. Its strategy is based on a governance structure designed to achieve business success in a just and responsible way, paying heed to the interests of its stakeholders and promoting cooperation with them.

**The importance of sustainability in managing our business is rooted in our Purpose.**

# Creating Value Responsibly

The Navigator Company's Agenda 2030 reflects our commitment to Creating Value Responsibly, aligned with global sustainability macro-trends, such as the climate emergency and biodiversity loss, demographic and social change, and technological innovation.

**W**e are inspired and moved by people, their quality of life and, above all, the future of our planet." This commitment, built into Navigator's Corporate Purpose, is wedded to the concept of "Creating Value Responsibly", which is the backbone of our 2030 Agenda.

And how does the company intend to achieve this? By identifying and minimising the main impacts of its forestry and industrial operations, and thereby boosting its positive contribution to protecting natural resources. By establishing close relationships with people, and specifically

with its employees, business partners, customers, and communities, listening to them and endeavouring to respond to their needs and expectations. By developing its business so as to generate value for stakeholders. By combining technology and specialist expertise, in order to create ever more sustainable products. And by responding to the urgent challenges now facing the planet, by adding value to forests and adopting a low-carbon economy model.

Starting out from this concept, Navigator's 2030 Agenda consists of a central focus and three strategic action areas, all aligned with the Corporate Purpose and the company's values.

## THE NAVIGATOR COMPANY'S CORPORATE PURPOSE

A commitment to sustainable development is easier to honour when it is built into a company's Corporate Purpose, i.e. how it sees the world. The Purpose tells us what the business is for, why it exists and what value it is intended to create. This makes it strategic for dealing with a rapidly changing world and society.

The importance of sustainability in managing its business is firmly rooted in The Navigator Company's Purpose:

*"We are inspired and moved by People, their quality of life and, above all, the future of our planet.*

*We want to share with society not only our results, but also our knowledge, our experience, and our resources in the search for a better future together.*

*We are therefore committed to creating sustainable value for our shareholders, and for society as a whole, leaving future generations a better planet through natural, recyclable and biodegradable sustainable products and solutions that contribute to carbon sequestration, the production of oxygen, the protection of biodiversity, soil formation and the fight against climate change.*

*The sustained, long-lasting success to which we aspire can only exist if it is universal, mobilizing and showing respect for every stakeholder with whom we interact: employees, customers, suppliers and society as a whole, particularly the communities that accommodate us, where we promote social inclusion and prosperity, and the rural world, where we are drivers of territorial cohesion.*

*Our performance will be gauged by uncompromising, transparent governance focusing the organization both on satisfactory shareholder returns and, over time, risks and the need for constant innovation and investment, as well as on our environmental and social outcomes.*

*We are guided by the belief that our true goals lie in the deepest aspirations of people, both of today and of future generations.*

*We believe in management with a long-term vision, anchored in ethical values, rigorous implementation, a never-ending search for innovation, and an appreciation for people and knowledge. All at a company that takes on the challenge of asking each day what it can do to create a better world." ♦*

## A Responsible Business

A central focus - A Responsible Business - cuts across all areas and all strategic action. It includes topics such as ethics, transparency, risk management, value creation and innovation. The underlying aspiration is to create value and opportunities for responsible business, applying ethical principles and demonstrating integrity and transparency in everything the company does.

This breaks down into four commitments (out of a total of 14, counting all the strategic areas), corresponding to specific goals that Navigator will achieve over the decade:

### Commitment 1

Develop sustainable bioproducts, reducing dependence on fossil resources and working towards a decarbonised economy. Navigator's specific goals involve developing new recyclable and biodegradable cellulose materials and biocomposites, and also developing biofuels, bioplastics and biochemicals from waste forestry biomass.

### Commitment 2

Promote scientific and technological co-creation in the field of the bioeconomy and bioproducts.

The goals include stepping up partnerships with universities and technology centres in Portugal and abroad, promoting advanced training, in collaboration with universities, leading towards 20 PhDs by 2030, and promoting the registration of intellectual property, with 20 new patents by 2030.

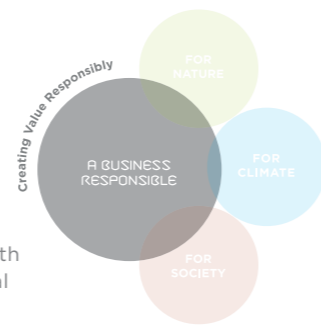
### Commitment 3

Promote improved yields, resilience and sustainability in Portugal's forests. By developing cloned plants and genetically improved seeds, boosting yields by between 30 and 50% and resilient to climate change; and by proposing biological solutions for fighting the main diseases and pests in Portugal's eucalyptus forests.

### Commitment 4

Develop innovative, competitive and sustainable products. This entails developing innovative and distinctive paper articles, in pulp, UWF (printing and writing) paper, tissue and packaging.

This central commitment lies behind the three strategic action areas on which Navigator has always been focused, but to which it is taking a more ambitious approach this decade: Nature, Climate and Society



The aspiration in the "For Nature" strategic action area is to preserve and add value to Natural Capital.

Boosting the yields, resilience and sustainability of Portugal's woodlands is part of Navigator's commitments to promoting responsible business.

## For Nature

Nature is Navigator's home and its future. A source of economic wealth and social development, a refuge for life and biodiversity, a factor of environmental quality and a crucial element for human life - this is the legacy that the company plans to leave to future generations.

In this strategic action area, the company's aspiration is to preserve and improve Natural Capital, by protecting, water, air and the forest, promoting generation of economic, ecological and social value, by minimising its ecological footprint and optimising efficiency in the use of resources.

### Commitment 5

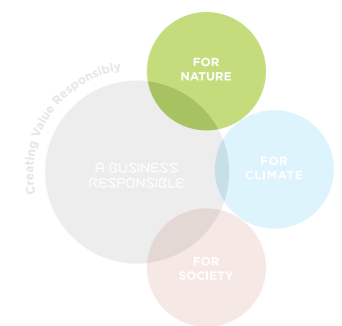
Promote efficient use of resources, minimising our ecological footprint. Achieving this involves reducing specific use of water (m3 per ton of output) by at least 33% by 2030, with reference to 2019 levels, optimising energy intensity, year after year, and proposing solutions that can improve efficiency in the use of water and wood in the industrial process.

### Commitment 6

Ensure sustainable use of soil and forestry resources, including biodiversity. Navigator intends to achieve this by using 80% certified origin wood by 2030, ensuring that all wood suppliers have chain of custody certification by 2030, by helping to reduce wildfires, ensuring that less than 1% of the area under the company's management is burned each year up to 2030, and by having a positive impact on biodiversity, through the measures entailed by the commitment made through the act4nature Portugal initiative.

### Commitment 7

Promote circular bioeconomy, prioritising R&D solutions. The aims include reusing 90% of all waste by 2030 and developing sustainable applications and added value for by-products from industrial process (sludges, ash and other inorganic waste).



**84%** of water used is returned to the environment

**87%** of all waste is reclaimed

**90%** of raw materials used are renewably sourced



6.1 million tons of CO<sub>2</sub> are retained in Navigator's forests.



Navigator is committed to sharing sustainable value with the different sectors of society.

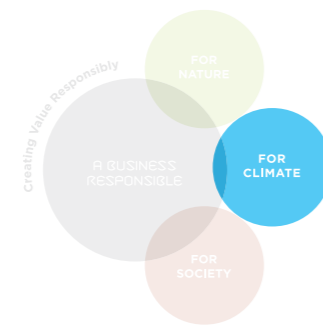
## For Climate

With the ambition of contributing to a circular low-carbon economy, the "For Climate" strategic action area makes Navigator part of the solution, with an active role in climate action.

The company is working toward early compliance with international targets, in order to achieve carbon neutrality at its industrial complexes in 2035. Recent investment of 55 million euros in a new biomass boiler at the Figueira da Foz mill allowed for an immediate 32% reduction in Navigator's total CO<sub>2</sub> emissions in 2021.

### Commitment 8

Invest in low carbon solutions leading to carbon neutrality. This entails an 86% reduction in direct CO<sub>2</sub> emissions from industrial complexes in 2035, with reference to 2018 values, and ensuring that renewable energy accounts for 80% of all primary energy used in 2030, also with reference to 2018 levels.



**6,1 million** t CO<sub>2</sub> retained in Navigator's forests

**70%** renewable energy consumed

**Navigator was awarded an "A" rating by the international Carbon Disclosure Project in 2019 and 2020, classing it as a global leader in the fight against climate change.**



## For Society

The Navigator Company believes that the essential function of companies is to generate and share sustainable value among the different groups in society that create, support and develop them. Its ambition is therefore to develop its people, engage with communities and share value with society on a fair and inclusive basis.

The company's commitment to developing its employees, their safety and well-being, and to local communities is long-standing, but took on a special relevance in 2020, due to the pandemic. A challenging situation in which the organisation rediscovered the meaning of team spirit and the power of pulling together.

Consolidating our close ties with people and communities, sharing value and stepping up our engagement, through dialogue and cooperation - all this has borne fruit and helped shape our 2030 Agenda, through a listening exercise in which we gathered the views of 540 internal and external stakeholders.

### Commitment 9

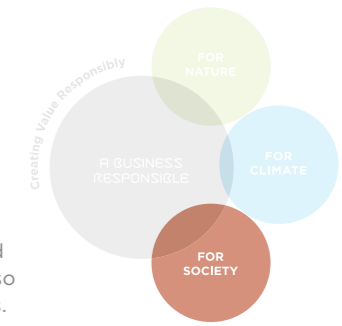
Promote development and upskilling of human capital in line with the Company's present and future needs. The aim is to reach 80% of Employees with development plans customised to their needs and professional plans, whilst also in alignment with Navigator's succession needs.

### Commitment 10

Contribute to the skills and employability of young people in the regions where we operate. This is achieved by establishing active partnerships with educational institutions in those regions, including curricular and vocational internships, as well as participation in teaching activities, events and fairs.

### Commitment 11

Promote an inclusive organisational culture able to integrate internal and external challenges. This can be done through permanent monitoring of the main motivational stimuli for Employees in order to arrive at more appropriate management practices, policies and processes.



**3,232** employee assessments

**1.7 million** invested in the community in 2020

**Commitment 12**

Provide a safe and healthy environment for Employees, ensuring their well-being. This involves attaining the aspirational target of Zero Accidents, through continuous improvement in safety, in keeping with the new 2021-2023 Health and Safety at Work Strategy, achieving a frequency index of  $\leq 2$  in 2030 (internal and external employees), stepping up the Occupational Health Programme through to 2030 and investing further in ergonomics, also by 2030.

**Commitment 13**

Develop community relations. Our community relations are built up through a strategy of designing forest literacy initiatives, aimed at primary school children, teenagers and adults, so that people are better informed about

Portugal's woodlands. The My Planet project plays a part here, as do Give the Forest a Hand and Florestas.pt. Another aim here is to promote and disseminate technical information about forestry production, helping to share best practices, through the Forestry Producers project.

**Commitment 14**

Promote knowledge transfer and public awareness of the economic, social and environmental importance of forests. Our aims are to implement the Forest of Wisdom project, in partnership with the Calouste Gulbenkian Foundation, to implement the UNESCO RAIZ Club, develop the Florestas.pt platform, consolidate the *e-globulus* platform and consolidate the Forestry Producers project. ♦

## What is a "sustainability agenda"?

At its root lies a commitment to incorporate environmental, social, economic and ethical factors into the company's strategic decision-making process. This includes an assessment of how these factors affect business and the company's various stakeholders, and what risks and opportunities are involved. When this has been done, appropriate steps will be taken to mitigate the risks detected and to make the most of opportunities.

Sustainability raises a wide array of issues with a potential impact on business, ranging from pollution and climate change through to education, poverty, health and human rights. It also involves a variety of stakeholders, such as employees and communities, suppliers and clients, NGOs and governments. And it

can include operations in various parts of the world, in different jurisdictions, where regulations and practices also differ. So, although sustainability is a global issue, the questions raised present a unique set of challenges and offer a distinct set of opportunities in each sector and, when we look more closely, in the case of each company. This means that no two sustainability agendas are alike.

Each company is a special case and must define for itself the fundamental principles of sound enterprise, identifying the needs and fundamental issues for a changing society, and responding with a successful business model. Because the first step to sustainability is to adopt measures that sustain the business itself. ♦



**Although sustainability is a global issue, the questions raised present a unique set of challenges and offer a distinct set of opportunities for each sector and for each company.**

Educating people about forests and their importance is one of Navigator's commitments.



## Governance for sustainability

The Navigator Company's governance structure is supported by several bodies with responsibilities relating to sustainability management, ensuring that corporate practices are tailored to fit a responsible business model.

**T**he Sustainability Department is the driving force behind the programmes designed to promote sustainable development, ensuring that sustainability takes root in the company's corporate culture.

The Sustainability Forum, headed by the Chief Executive Officer, promotes dialogue and cooperation with the main stakeholders on topics relevant to sustainability. In addition to external specialists in various fields related to sustainability, such as climate change, the forum also includes the members of the Environmental Board, the body responsible for issuing reports on environmental aspects of Navigator's operations and submitting recommendations on the environmental impact of its main developments.

The Ethics Committee is responsible for considering and assessing any situation arising from a breach of the Code of Ethics.

The Community Liaison Committees are local bodies set up for each of the company's industrial complexes (Aveiro, Figueira da Foz, Setúbal and Vila Velha de Ródão). A variety of stakeholders are represented on these committees, including representatives of municipal authorities, local public bodies, NGOs, universities and others. The aim is to strengthen local ties and community engagement, by implementing a policy of openness and sharing relevant information about the different industrial complexes, in order for the company to learn more about its partners' expectations and needs. ♦



The Navigator Company's governance structure includes a number of bodies that work to promote and manage sustainability.

## Sustainability Forum 2021

# "Woodlands protection has to be dynamic"

**S**takeholder engagement is a priority topic for Navigator and led it to redesign the workings of its Sustainability Forum in 2020. It has now adopted a regional model, able to bring the company closer to local communities around its industrial and forestry operations.

The latest forum was held on 19 October 2021 and debated the topic of "Dynamic Forest Protection". The venue was in the Municipality of Torres Vedras, where Navigator works with the local authorities to defend woodlands against fires and to manage the Socorro and Archeira Uplands Local Protected Landscape.

In a country with few natural resources, Portugal's woodlands have been vital as a driving force for its development, but the future presents challenges that now must be faced, as António Redondo, CEO of The Navigator Company and Chairman of the Forum, explained. "Defending woodlands cannot mean just passively conserving what exists, it has to be about generating future value in this fundamental resource, whilst always respecting nature, the landscape and communities", he said in his closing address.

"Planted forests are fundamental to the transition from a linear, fossil economy, based on finite resources and hostile to the climate, meaning that it has no future, to a sustainable circular bio-economy, based on renewable, recyclable and biodegradable forestry products, beneficial to nature and climate-neutral", António Redondo continued. Navigator's CEO highlighted the example of the pulp and pulp and paper industry, which uses "a natural raw material that we plant and care for, harvesting it when mature, and then

replant, when the authorities allow us to, in a continuous, perpetual cycle", in what he described as "a bioindustry which is on the right side of the future".

### The transformative role of forests

This idea was also stressed by Marc Palahi, Director of the European Forest Institute and the keynote speaker at this Sustainability Forum, in his talk on the transformative role of forests and the crucial importance of woodlands ecosystems to a sustainable future. Defending a new economic paradigm that "puts nature, forests and people at the centre", Palahi underlined that "the forest is not just the largest terrestrial ecosystem for carbon storage and the main source of biodiversity, it is also the largest source of natural resources which, managed sustainably, are by nature renewable and circular".

Forests are facing challenges caused by climate change, but this is "an opportunity for natural and renewable solutions, that will help to decarbonise our economy over the next two decades", he went on, calling for priority investment in the forestry sector. Marc Palahi also argued that "people who care about protecting woodlands, biodiversity and carbon sequestration should realise that forests are dynamic systems that need to be managed actively in order to ensure they adapt to the new climate reality". "What we're saying is that the bioeconomy and biodiversity, adaptation and mitigation, are two sides of the same coin for a sustainable future for forests", stressed the Director of the European Forest Institute, an organisation that conducts research and supports political decision-making on issues relating to woodlands, for 29 European countries, including Portugal. ♦

# Good for the planet, people and business

The United Nations Sustainable Development Goals and Decade of Action have set 2030 as the deadline for complying with the guidelines they set for the world to work together to create a better future.



**2**015 was the year of two important world events that signalled a radical change in global cooperation between nations. At the Paris Conference (COP21), 195 countries met to reach a universal and binding agreement on climate change, in order to keep global warming below 2°C. A few weeks earlier, at the headquarters of the UN, world leaders adopted a **2030 Agenda for Sustainable Development**, a commitment to fighting climate change and setting collaborative, consensual and concrete targets to protect our collective future as a society and the future of the planet.

The UN Agenda sets out 17 Sustainable Development Goals (SDGs) which require urgent collective action, as the adverse impacts of climate change become increasingly clearer, and given that threats such as poverty, famine, water scarcity, unemployment and inequality still affect many people all round the world.

In 2020, five years on from the setting of the 2030 Agenda, progress on achieving the SDGs was lagging behind what was needed, and so the UN launched a fresh challenge to speed up attainment of the targets, with the Decade of Action. This runs from 2020 to 2030 and represents the deadline for all member countries of the United Nations to comply with the 169 targets delineated under the 17 Sustainable Development Goals.

"In order to achieve a world that is sustainable, prosperous and at peace, we need a Decade of

additional Action, with wholehearted commitment and dedication. The cost of failing to meet the Sustainable Development Goals is impossible to bear and mankind's destiny and future will be decided today, in the action we all take in our daily lives", declared the UN.

No one can afford not to respond to these global challenges. But companies, because they contribute to public and individual finances, and because they supply products and services, influence how society evolves as a whole, and so have the potential to exert a significant impact on attainment of the SDGs. Which is excellent news for the planet and for people, and also for business.

A more sustainable route to development requires companies to acknowledge that environmental, social and economic issues are all interwoven along the value chain, with the potential to offer a competitive advantage. As a result, in the various areas where the opportunity arises to address environment and/or social issues, companies have the chance to innovate, to be different, to create value and use this to attract more customers, at the same time as they also boost worker motivation.

In other words, sustainability issues present a unique set of challenges and a unique set of opportunities, increasingly and intrinsically linking commercial success and delivery of long-term value to a business commitment to sustainable development. ♦

The concept of "sustainable development" first emerged in 1987, in the report entitled "Our Common Future", from the UN's World Commission on the Environment and Development: "Development that meets the needs of the present, without compromising the capacity of future generations to meet their own needs".

## Material topics and SDGs

The process of designing the 2030 Agenda identified 12 material topics, which are the issues considered as most relevant for the company to work on over the decade ahead. In view of the holistic character of sustainability questions, all the topics are interrelated, which is why the company's responses must be integrative.

These material topics, listed in the infographic on pages 6 and 7, were cross-references with the United Nations Sustainable Development Goals, resulting in three different levels of classification, considering Navigator's potential contribution to attaining them. Firstly, there are five 'Core SDGs', where the positive impact offers an opportunity to create long-term sustainable value and a way of enabling Navigator to change to respond to future challenges. These are joined by four 'Supportive SDGs', where the company will have a direct or indirect impact, representing an opportunity for sustainable economic growth through more responsible management of resources, generation of value in communities and partnerships with stakeholders. And lastly there are eight 'Other SDGs', with which the 2030 Agenda will interact less directly, although there is a potential positive contribution from Navigator's commitments and business plans. ♦



### Core SDG



### Supportive SDG



### Other SDG



# “We are inspired and moved by people, their quality of life and, above all, the future of our planet.”

How can a company prosper in a rapidly changing world? The Navigator Company believes that sustained growth is achieved in harmony with nature and is something that starts and ends with people and their aspirations. This is why, during the complicated months of the pandemic, it still pressed ahead with its key projects for the future. It continued to work on designing its sustainability agenda for the next decade, it stepped up support for employees and set its R&D teams to work on a programme that culminated in the launch of new tissue products and its own one-of-a-kind packaging paper brand. In this interview, António Redondo, CEO, talks to us about this new phase of diversification: “We’re a bioindustry on the right side of the future”.



**T**he Navigator Company has publicly stated its Corporate Purpose, which starts by saying that “We are inspired and moved by people, their quality of life and, above all, the future of our planet.” What does this mean and what does the release of a statement of this type tell us?

The Corporate Purpose goes much further than the Mission (what we do) and our Vision (what we want to be). The Purpose goes to the heart of our reason for existing and why we do what we do. The Corporate Purpose is the fundamental role for our existence, it includes the expectations of all our stakeholders and explicitly states our role and value in society. So, this goes far beyond the tradition “Mission” and “Vision” and describes the mark we want to leave on the world for generations

to come. It pulls together the different threads to shed light on the motivation that makes sense of what we do. We don’t work hard just to make the best products in the world in our sector. We work hard because, by so doing we are leaving future generations a better world than the one we found.

It is fundamental for our future that we should seek out more sustainable models for development. This is a challenge for us as individuals and as an organisation, demanding the best from each one of us, from our suppliers, our clients, from society at large, but also from the State. Our Purpose shines a light on the road we want to travel, individually and together. People are both the starting and the finishing lines for what we want to achieve. It is with them and for them that we innovate, that we cultivate excellence and high standards of execution, that

we create new solutions for a more sustainable future.

We should not see companies just as organisations focused solely on the profits they generate. We should see them as active agents of change for a better world - a better society, a better planet. Profits are obviously highly important, they are how we measure how we are progressing in this journey of change to a better world for people and for the planet. They are the indicator that tells us that we can continue to be active agents in bringing about that change. Above all, they are fundamental for us to be able to speed up the pace of transformation. They are not an end in themselves! But they have to enable us to pay an adequate and sustainable return on the different forms of capital invested, that of our shareholders, our lenders, but never forgetting the human

and European target dates. We have allocated investment of 154 million euros to achieve this target by 2035. But just because we set a goal for 15 years’ time was no reason not to start right away - the first major stride in this journey was the construction and start-up of the new biomass boiler at the Figueira da Foz site, making it the Group’s first integrated pulp and paper mill producing all its power from renewable sources. This was a capital project worth 55 million euros, representing a cut of 32% in Navigator’s total emissions in 2021, meaning that it represented one third of the progress that the company voluntarily set out to achieve by 2035. If in 2021 and 2022 the impact on the company of rocketing CO<sub>2</sub> prices is very moderate, it is because we had the courage in the midst of the pandemic to press ahead with building and commissioning this plant for producing power from renewable fuel.

#### But you’re keen to go further...

Yes, we want to go further. The 2030 Agenda is a conceptual and operational blueprint that will guide The Navigator Company through the challenges and opportunities of the decade ahead. It’s an agenda for responsible business management, through which we intend to increase our contribution to creating value and sustainable growth in a changing world. An agenda put together over 18 months, with the involvement of 540 internal and external stakeholders who, in hundreds of debates, interviews and surveys, all contributed to this new framework for change.

#### You said that “People are both the starting and the finishing lines for what we want to achieve” - can you expand on that?

There’s a key idea: it’s The Navigator Company’s wide-ranging human dimension that makes it relevant and meaningful. Because this is what lies behind our contribution to society and the economy.

We offer people quality of life and well-being through our forest-based products and solutions - natural, recyclable and biodegradable, highly important for retaining carbon and producing oxygen. In practical terms, this means printing and writing paper, and tissue, but it also now includes more sustainable packaging solutions, providing a real alternative to fossil-based materials such as plastics. As well as many other products we currently have on the drawing board.

capital of our workforce. And of course, we must be aware of the risks that each of these stakeholders runs in providing their capital for the organisation’s use. We have a very clear idea of our position as regards the challenges facing society today. Initiatives such as the UN Decade of Action, or the European Green Deal, may be essentially just aspirations, but they are nonetheless clear about the urgency of the situation we face. But they are also a clear sign of recognising that companies are the driving force for change, when they are able to conciliate their Purpose with creating environmental, social and economic value.

#### Is that the context in which The Navigator Company’s 2030 Agenda was drawn up?

That and more. The 2030 Agenda has grown out of Navigator’s responsible business management strategy. It’s

about taking it to a new level, being more ambitious and looking further, a commitment that we have systematically been making to “Sustainability”. A position that, over two and a half decades, has been carved out with the courage to face collective challenges across the whole company.

#### Such as?

For instance, when, less than a year after it was founded, in 1996, Soporcel joined the WBCSD. Or in 2006, when the company took the lead in Portugal by publishing its first Sustainability Report. More recently, in 2019, when The Navigator Company became one of the first companies in the world, and the first in Portugal, to make a public declaration of its commitment to achieve carbon neutrality at its industrial complexes 15 years ahead of the national

We also create an impact that goes far beyond what we produce. Navigator's world extends beyond mere commercial dealings, because it is also based on sharing our knowledge and expertise, such as in the countryside, where we cultivate a relationship with forestry producers that involves a significant element of education about the value of sustainable forestry management and certification, contributing to better woodlands. Forests with better yields, and that are much more resilient. But we also share our expertise with customers, teaching them to make the most of our products. And with society in general, through the "Florestas.pt" platform, a project coordinated by our research institute, RAIZ, providing technical and scientific information about forests, with the involvement of a large number of academics, scientific organisations and others in the forestry sector, and "e-globulus", an online initiative, also coordinated by RAIZ, designed to support and encourage the adoption of sound management practices in Portugal's eucalyptus forests. We also share our expertise with a number of non-commercial organisations in the research and innovation system, such as universities, collaborative laboratories and other R&D institutions with which we cooperate. And our suppliers. So, there are flows of materials, flows of funds and flows of information and knowledge with all our stakeholders. Navigator is a hub that brings together tens of thousands of people, starting with around 3,200 employees who handle operations in extremely varied skill areas and geographical regions, and extending to around 7,000 suppliers, most of them in Portugal, and then almost 2,000 regular clients in 130 countries worldwide, scientists, researchers who improve our forests and our products, local communities where we generate employment, national and international institutions, political and regulatory decision makers, and investors.

**You mentioned a workforce of around 3,200 as part of this human dimension...**  
... a dimension that marks us out as what we are today. The most crucial capital investment of an organisation, its human capital, our people, their skills and professional development - this lies at the heart of Navigator's Purpose and strategy, and can be seen in the action plans we have been developing and implementing.

#### Even during the pandemic?

The pandemic made no difference to the path we travelled in previous years, rather the reverse. In 2021, we implemented a new career plan for operational technicians, applicable to 1,958 employees. The measures envisaged are reflected in pay more than 40% above the sector average. The steps implemented in 2021 benefited 94% of Navigator's employees and represented investment totalling 3.7 million euros. The average pay rise per employee was 4.15% last year, on top of 3.1% in 2020 and 4.4% in 2019. These increases, in three consecutive years, in extremely difficult market situations and no inflation, are unparalleled in Portuguese industry, or even in our sector internationally, and represent a very real improvement in pay and in the purchasing power of our employees.

We know that the company's success is based on the work and dedication of our employees, and so we have stepped up our commitment to rewards based on merit, a principle that we hold firm, with career advancement and promotion for operative technicians and salary rises pegged to performance for middle and upper management. I must also mention another critical factor, which is the retention and development of young management staff, and here we have also set up a salary development plan that in 2021 was applied to 114 employees. At this very demanding time for all of us, as a result of the pandemic situation, we also focused on improving employee benefits, including contributions to education expenses, health and life insurance, as well as improving sick pay. These benefits are equivalent to 1.25 average salaries. In reality, over the past ten years, with benefits and bonuses, we have made on average more than 17 salaries each year. We have also invested in the training we offer and have run more than 500 training courses in different areas. These have been complemented by a further 600 courses available in an e-learning format on our Learning Center portal, and open to all employees - staff can look for the training topics that interest them most and design their own learning path, to suit their individual preferences. In total, by the third quarter of 2021, we provided over 160,000 hours of training, involving more than 2,500 employees.

**What has been the lasting impact on Navigator of almost two years of**



#### constraints imposed by the global health crisis?

First, we can be confident of having a team that never gave up the fight in the face of adversity. The pandemic was a difficult period for everyone, but this period will go down in the history of our company as a time when our people showed their true mettle, refused to give in and fought for the future.

#### Can you give us some practical examples of this?

From the start of the pandemic, our response was twofold: protecting employees and communities and, alongside that, a Business Continuity Plan, based on multiple scenarios, capable of helping us to steer the group through a highly volatile and uncertain situation, where little information was available. I would like to recall that even before

**"The pandemic period will go down in the history of our company as a time when our people showed their true mettle, refused to give in and fought for the future."**

the WHO declared a pandemic, we were already implementing our first Contingency Plan and, in April, we had mapped out three alternative business scenarios and boosted the company's cash resources by more than 200 million euros, so as to be ready for the more disastrous scenarios, which happily did not materialise. This crisis offered a test for our staying power and team spirit, calling on all our skills across the Company. We succeeded in adapting quickly to a rapid swing in the market and effectively mitigated the consequences of the crisis on The Navigator Company's results.

#### What were the priorities in terms of business?

Irrespective of the critical situations such as that we experienced, the priority of this management team has been,

simultaneously: to make our existing businesses (forest, pulp, paper, energy and tissue) more robust, focussing the organisation on careful management of our underlying fixed and variable costs, defining, implementing and communicating the value proposition and the resulting pricing, production volume and sales strategy for those businesses, building on our human capital and developing our workforce and seeking out new avenues for innovation, differentiation and growth. During the pandemic, our business model once again proved to be extremely resilient in the face of difficulties, but it also shone light on the need to stay competitive by systematically controlling costs, and at the same time pursuing our strategy for growth, based on exploring new business opportunities. Strict cost controls are absolutely fundamental in any organisation, irrespective of the management strategy adopted and the phase in the company's life cycle or that of its markets. In Navigator's case, it is essential to protect our margins, in order for us to gain time and resources to safeguard our capacity to invest and finance our projects for growth.

#### Do you see the post-pandemic market as more complex, in particular for UWF paper?

The market context is challenging, but we are very confident in our ability to overcome the difficulties, as we have always succeeded in doing in the past. One thing we have noticed, as some of our leading European competitors have announced the closure or conversion of their paper mills, is that our clients recognise our resilience as a manufacturer of uncoated printing paper. A number of companies that previously didn't work with us, or with which we only did business sporadically, have approached us to discuss how we can build up our dealings in future. What they mostly say is that they believe we are the company that has invested most in long-term UWF business in Europe, and so they feel they are sure to work with us in future. UWF paper is our main product, and this is a market that has long matured in most of the regions where we operate. But this, in itself, is not a threat. There are countless sectors that long ago reached this level of maturity in Europe, and the companies that operate in them, above all the leaders, those that have succeeded in adapting, continue to

## "UWF paper is the most universal and versatile form of printing paper, enabling us to process, present and protect information. Above all, it helps us to reflect on it!"

operate profitably. Sometimes even more so that when the markets were growing and competition was much more intense, requiring them to invest more in assets and in their brands.

We are actually living through a buoyant period for paper demand, as shown by the fact that Navigator closed the month of November 2021 with an order book of more than 80 days, a new all-time high, and ended the month with just 13 days' stocks, also a historically low level. Global demand for printing and writing paper grew by 3% up to October 2021, and UWF recorded growth of 4%. In Europe, demand over the first eleven months performed even better, growing by 6%. Navigator's sales, in all markets, reflected this substantial improvement over the course of the year, growing by 12% in volume and 15% in value.

### In other words, reports of paper's "demise" are greatly exaggerated...

I would say that the "apocalyptic prophecies of a paper-less world" may have been rather hasty. As were the predictions, some decades ago, of paper-less offices. Not only have we not seen the end of printing paper, but we are increasingly seeing paper as a solution for host of products that previously used fossil-based materials...

### ... but we have to acknowledge that digital media are still growing...

We are clearly moving towards a world with less printing and writing paper, but not towards a paperless world. UWF paper is the most universal and versatile form of printing paper, enabling us to process, present and protect information. Above all, it helps us to reflect on it! Neuroscientific research has shown that paper is superior to electronic media for learning purposes, in terms of both writing and reading. This superiority is evident in the comprehension, analysis and expression of more complex concepts, and also in the in-depth retention of knowledge,

in contrast to the more superficial, and so more ephemeral, learning achieved using online media.

It has also been shown that the mere presence of screens, i.e., computers and smartphones connected to the internet, while people study or work, is highly detrimental to concentration, focus and, consequently, to learning. The brain, and especially that of children and young people, presents this weak point that resulted from our process of evolution. It was "designed" to find and process information, for the sake of survival - to find food and to protect us against external threats, such as predators. It is programmed to be alert. In our modern world, that results in FOMO: fear of missing out. So when children and young people are studying with an electronic device connected to the internet by their side, their brain is always remembering that "Something new might be out there...". They don't even need to have notifications switched on, there is this constant motivation to search for new information.

Even as adults, in the world of work, who has not felt these harmful effects of digitisation? There's a recent interview with the neuroscientist Michel Desmurget, author of "The Digital Cretin Factory", that demonstrates quite brilliantly how all this works. As we become aware of this manipulation enabled by digital media (and this, as research has started to show, can even lead to other addiction processes among young people, as well as an addiction to screens, lower IQs and the blunting of critical faculties), people will again realise the central importance of UWF printing and writing paper in education and in the workplace. What's more, at a time when people around the world are increasingly aware of climate change, paper has firmly established itself in the paradigm of sustainability and the circular economy, based on products sourced from natural, renewable, recyclable and

biodegradable raw materials, able to substitute fossil-based products, such as plastics, in the packaging sector. Indeed, paper can not only boast high recycling rates, at around 74% in Europe, but it can also be recycled several times, and then be used for energy production at the end of its life cycle, emitting biogenic CO<sub>2</sub> and avoiding emissions of fossil CO<sub>2</sub>. And it's here that *Eucalyptus globulus* fibre comes into its own. In a comparative analysis by RAIZ, following up on research initially conducted in Japan, it has been shown to withstand ten recyclings, whilst other paper fibres can only cope with four to eight cycles. From the perspective of its initial use in printing and writing paper, and, in future, of its use in packaging, either directly as virgin fibre, or else by recycling printing paper to reuse this fibre in packaging, this is huge advantage that eucalyptus enjoys in relation to its competitors.

### So how should we manage this phase of the life cycle of UWF, uncoated woodfree paper?

The most important thing, on the one hand, is hang on to our competitive advantage, striving from day to day to ensure that consumers continue to prefer our products and brands. At the same time, we have to allocate capital intelligently to our current business, to the precise extent needed for us to remain viable over a long-time span, whilst starting to invest in new products and businesses, which will carry the company into the future.

This is the reasoning behind our emphasis on stringent control of fixed and variable costs, our obsession with maintaining high levels of productivity and quality in our operations, and our focus on ensuring that our brands are always the first choice of the consumers we target. It's by combining all this that we can maintain profitable sales volumes and margins in the UWF sector over many years, giving us the time we need to develop businesses that are

still at the growth phase, with greater potential for sustained development over the decades ahead.

### But in the wider economy we can see pressures from record-breaking prices for energy, CO<sub>2</sub>, some of the main raw materials and even logistics...

Certainly, and that means we have to be even more focused on the value drivers in our business. Soaring prices across the board will be with us for some time and the pressure on our margins can already be felt. Actually, it's my belief that the pressure will be even greater over the next few months. So we have to press ahead with improving productivity at our mills, extracting more tons of output from each asset and moving towards levels of performance that in some cases we achieved in the past, and that we will doubtless succeed in repeating in future. But we have to manage to do more with less, optimising specific consumption in all areas and adjusting production plans to minimal costs. We have to fight waste and find new ways - often simple and fast - of making more from less. We have a scheme called "Straight to the Top", which invites employees to identify these opportunities as a team, and to get a bonus as a reward.

### In the new sustainable development model, how does the future look for forest-based enterprises, such as Navigator?

The paradigm shift we are currently living through offers a host of new opportunities for forest-based products. I'll give you two examples, out of the many possibilities. We can look at the need to substitute plastic articles, especially disposable packaging, i.e., single-use plastics. Or at the reduction in synthetic fibres in the textile industry, replacing them with fibres obtained from cellulose - this gives you an idea of the rising demand that forestry products may enjoy in future.



Navigator's investment in tissue involves innovative solutions, such as products with additives. Amoos Aquactive, impregnated with soap (above), was named a "2022 Five Star" product, outperforming the other five brands assessed in the kitchen roll category.

## TISSUE: "We're developing innovative solutions"

"Despite the severe restrictions on mobility imposed at the start of last year, our tissue sales up to November maintained the excellent performance recorded in 2020, totalling 96 thousand tons. The average sales price was slightly higher (up +2%) than in the previous year and sales prices for finished products tended to rise. In terms of products, we are investing in developing innovative solutions for the hygiene and health market, such as tissue products with additives - lotions, perfumes, softeners, antibacterial and antiviral substances, and repellents, among other things. Products which, alongside our basic ranges and our latest innovations, such as Air Comfort and Aquactive, will continue to secure sustained growth in this business area." ♦

Apart from the traditional applications, Navigator and other companies in the sector are involved in promising R&D projects to generate a wider range of tree-based bioproducts, some of them substituting products currently obtained from petrochemicals.

On the basis of various chemical components of eucalyptus, and not just from the wood-based cellulose, it is likely that in the near future we will have food supplements and bioactive compounds for nutraceutical products, including prebiotics, food additives, such as thickeners or aromatisers, natural products for use in cosmetics or pharmaceuticals, polyurethane for heat insulation, biofuels for road, sea and air transport, resins and glues, chemicals, such as ethylene, for producing biopolyethylene, bioplastics for applications in food packaging, biocomposites for the motor industry, or flexible electronic devices, such as electronic sensors in paper for clinical diagnosis and monitoring food quality... as you can see, the list of opportunities is vast! Not all of these will be technically and economically viable products in the next few years. Some never will be, others will take many years to reach that point. But I am confident that these may be some of the avenues that open up for increasingly wide use of our forestry plantations, generating greater wealth, alongside more traditional uses, which in the years ahead will continue to represent the bulk of the forestry products consumed.

**Portugal is here faced with an opportunity. How can we conciliate this need to plant and harvest more trees with balanced management of natural resources?**

In Portugal, woodlands are the main form of land use, at around 36%. This is in line with the global average, which is just over 30%. In the early twentieth century, forests accounted for less than 18% of the country's land area, so the growth has been impressive and been counter to the wider trend worldwide. Today, we know that without planted forests, Portugal's woodlands would be significantly smaller. In Portugal, native forests account for less than 1% of all woodlands, whilst what are called semi-natural forests, consisting of native and exotic species, regenerating naturally or through planting, constitute the large majority, at 71%. Planted forests represent 28% of the total.

**In other words, what you're saying is that this growth due to planted forests means better woodlands? More diverse?** Yes, it's a fact. Portuguese woodlands have not only doubled in area, but

**"Woodlands are uniquely rooted in our socioeconomic life. The industrial clusters that have grown up from Portugal's eucalyptus, cork oak and pine woodlands directly employ more than 100 thousand people, whilst accounting for 5% of GDP and 10% of exports."**

are also much more diversified than at the start of the twentieth century. Cork oaks, holm oaks and pines remain the dominant species, although their relative importance has declined, from 91% to 61%. Growth in eucalyptus, a species planted in Portugal since the early nineteenth century, i.e., for around two centuries, and today a naturalised species, has established it as the third most common forestry species. Oaks, chestnut trees and other species account for the remaining growth in forest cover. As well as present greater diversity in its forests, Portugal has the third largest percentage of protected woodlands: around 22%, exceeded only by Italy and Germany.

**The word sustainability is today being applied to everything, which has tended to erode its importance. How can we take a sustainable approach to forests intended for production?**

With a holistic approach, which is of course the only way to think of sustainability – taking its three pillars: environment, society and economics. And planted forests are rooted in each of these three fundamental areas. Portugal's woodlands are of inestimable environmental value, because they play a crucial role in preserving biodiversity and in the quality of the air we breathe. Forest is in fact the main onshore carbon sink that the country possesses, and which can be expanded to face the challenges of decarbonisation that Portugal has set itself: each year, Portuguese woodlands sequester around six million tons of greenhouse gases and have an accumulated stock of 334 million tons of CO<sub>2</sub>.

At the same time, woodlands are uniquely rooted in our socioeconomic life. The industrial clusters that have grown up from Portugal's eucalyptus, cork oak and pine woodlands directly employ more than 100 thousand people, whilst accounting for 5% of GDP and 10% of exports. These industries are of great strategic importance for the future of our country – because of their economic impact on the trade balance, on gross value added, on job creation and on the division of wealth, and also because they retain populations in regions where opportunities are few and far between, and also because they foster stable, short and resilient circuits for the supply of goods and provision of services.

**When we think of the quality of the air we breathe, we immediately think of trees, of forests, but it is curious that the service provided by forests is not remunerated. In planted forests, how can we conciliate the aim of production with the other ecosystem services they provide, in particular as regards the environment?**

Through a fundamental concept: sustainable forestry management. This type of management, like that we apply in our forestry holdings, involves conciliating all the different aspects of woodlands, so that the interests of sustainable production of wood and other forestry products is compatible with the functions of conservation and protection, leisure, CO<sub>2</sub> retention, combating erosion, regulating the water cycle, preserving biodiversity and many other "ecosystem services" that planted forests provide and from which society benefits for free.

The truth is that the "environmental movement" has been partially hijacked by a small number of individuals seeking to use it opportunistically for their own radical policy ends, in some cases out of ignorance and in others to sow dissent. These people try to create the idea that



RAIZ – Forest and Paper Research Institute is accredited as part of the Portuguese Science and Technology System, and as an Interface Centre (Technology Promotion and Transfer Centre). This institute is a joint venture between The Navigator Company, the University of Coimbra, the University of Aveiro and the School of Agriculture from University of Lisbon.

these "ecosystem services" are only provided by conservation woodlands. They couldn't be more wrong, as we demonstrate scientifically and technically every day on the properties we manage. As well as driving growth and renewal, properly managed plantations are crucial in easing the pressure on native woodlands, allowing these areas, currently in decline, to be managed exclusively for the purposes of conservation and protection.

**And what's the relationship with biodiversity?**

All sustainably managed forests should promote a positive impact on biodiversity. In Navigator's case, we have adopted a conservation strategy whereby we implement a series of management procedures, including buffer areas to protect valuable habitats, and we delay forestry work and maintenance operations when the work coincides with the nesting season of particular birds, for example. In the woodlands currently managed by the company, more than 240 species of fauna and more than 80 species and sub-species of flora have been identified, including several protected and endemic species. This is significant work and

**"By using the economic value generated by well-managed and productive forests, we can improve specific practices in areas of conservation, and also improve conservation values in production forests."**

an important contribution we make to the country. I really don't know if there is any other private, or even public, organisation that works simultaneously on georeferencing and protecting more than a thousand species. In line with our Purpose, we will soon also be sharing our knowledge in this area with society.

**And what about the efficiency of carbon sequestration?**

Contrary to the idea put about by what is fortunately just a handful of activities, whose motivation is largely ideological, this is also not the sole province of what are called "primary forests", managed in accordance with "forestry practices close to nature" In Portugal, planted eucalyptus woodlands are the second most important form of forest cover in terms of accumulated CO<sub>2</sub> stock, with more than 71 million tons - the most important is pine woods, because of the average age of these stands. Eucalyptus has an annual CO<sub>2</sub> carbon sequestration rate seven times (7x) higher than cork oaks and three times (3x) higher than pines.

**The Sustainable Development Goals, the Paris Climate Agreement, the Strategy for Forests and the EU's targets and policies present highly diversified visions and demands for European forests. Do you think that the role of planted forests is being recognised in the way you just explained?**

We must be clear and acknowledge that the value of forests is not always properly understood. On the one hand, we are at the forefront of substituting plastics with naturally sourced products, of helping to substitute fossil fuels, directly and indirectly. On the other hand, when it comes to taking a broad view of the multiple uses of woodlands, I think that every mention of forestry products, or planted forests, is met with resistance from sectors of the public with a narrow environmentalist vision, rather than a broader ecological vision of the world, overlooking the fact that production forests, and plantations in particular, can play a unique and fundamental role in achieving the goals of the European Green Deal.

As an industry, we cannot accept the simplistic dividing line between conservation and production forests. On the contrary, by using the economic value generated by well-managed and productive forests, we can improve specific practices in areas of conservation, and also improve conservation values in production forests.

**Do you mean that the public is prey to misconceptions about production forests?**

It has to be recognised that over



Responsible forestry management conciliates the different functions of woodlands, from production to conservation of wildlife and biodiversity.

recent years, campaigners with little interest in economic growth or the country's development, especially in its rural areas, have waged a remarkable propaganda war, aimed at certain types of city-dwellers, based on disinformation offering only partial and extremist visions of reality, inciting fear and even hatred against people who take business risks, create wealth, employ others, pay their taxes... But I am hopeful that the real facts about our sector - technical and scientific facts, as well as economic, social, environmental and also cultural facts - can set the record straight, with hard evidence of who we are and what we do for the country's woodlands. Supporting well-managed production forests is the key to maximising the role of forests in society, promoting economic benefits and social development, as well as preserving ecological value. It is crucial to be effective in minimising risk factors, such as fires, or pests and diseases - which alone should be enough to justify public policies that clearly support planted forests. And this is the most effective way of increasing the combined effect on the carbon sequestration rate, on soil protection and formation, on water cycle management and on the protection of biodiversity. Planted forests are fundamental to the transition from a linear, fossil economy, based on finite resources and hostile to the climate, meaning that it has no future, to a sustainable circular bioeconomy, based on renewable, recyclable and biodegradable forestry products, beneficial to nature and climate-neutral.

**"Exploring new business opportunities requires time and investment capability. That is why it is fundamental to manage our current operations on an efficient and optimised basis, so that we have the resources and capacity to prepare the organisation for the challenges ahead."**

**Out of all opportunities for developing the bioeconomy, what options does Navigator have on the table?**

As in the past, Navigator has a vision of growth based on the pursuit of innovation and differentiation. We want to diversify while still investing in tissue, as well as to create and then consolidate a packaging business. In both cases, by developing innovative solutions. At the same time, we are developing our operation in Mozambique, which is starting with the sale of timber and which we see as a firm platform for growth in the longer term. Also taking a long-term view, we are working on several other innovative projects to explore ideas in the fields of biofuels, green hydrogen and biocomposites. This style of growth is aligned with our Corporate Purpose and makes an active contribution to the shift towards the circular bioeconomy of the future. In this context, Navigator was one of the first companies to sign up to the Circular Bioeconomy Alliance (CBA), set up on the initiative of the Prince of Wales - a conceptual framework for using renewable natural capital as the basis for managing and transforming land, food, industrial and health systems, and cities. We have been working on this with the European Forest Institute, which is a facilitator of the CBA. We are ready and prepared to help build a sustainable future with the development of new forest-based products, substitute fossil products, which are finite and hostile to the climate and to the environment. This transformation centred on the development of innovative forest-based



The Social Development Programme run by Portucel Mozambique, partly owned by The Navigator Company, is one of the main vehicles through which the company shares value with communities in the project areas, in Manica and Zambézia provinces.

products will be crucial for achieving the goals of the European Green Deal, ensuring a socially just transformation to an economy which is nature-positive and climate-neutral. Exploring new business opportunities requires time and investment capability. That is why it is fundamental to manage our current operations on an efficient and optimised basis, so that we have the resources and capacity to prepare the organisation for the challenges ahead.

**Does the launch of the new packaging business area fit in with this strategy?**

The new range of packaging papers is part of wider efforts to diversify and grow the Group's business portfolio, and also reflects our "From Fossil to Forest" strategy. Besides, the gKraft range is one of the most important launches in Navigator's recent history, because it highlights something that it absolutely fundamental and disruptive: it shows how innovation is necessarily the way forward when we seek sustainability that is lasting and relevant to the lives and future of people. In this case, by offering an alternative that makes it possible to reduce the use of fossil-based materials, such as plastic, and replacing them with renewable and sustainable forest-based materials, like the paper featured in these new packaging solutions. I cannot fail here to point out that, alongside sustainability, innovation, the ability to think outside the box and the will to succeed are all qualities that can be traced back to the very beginnings of The Navigator Company and are part of its DNA. What we are today is

something that actually started in 1953, when a group of pioneers led by Manuel Santos Mendonça, the grandfather of Pedro Queiroz Pereira, started up Companhia Portuguesa de Celulose, in Cacia, a venture that made the headlines when, for the first time in the world, its technicians succeeded in producing *Eucalyptus globulus* pulp using the innovative kraft process. This commitment to innovation, reluctance to accept limitations and collective will to succeed are the most valuable assets of our identity as a company.

**You've mentioned innovation as a strategic factor in the company, but also as a distinctive element in this new generation of packaging products. What's different about the gKraft range and why is it so disruptive?**

gKraft is based on an innovative high-performance chemical pulp, developed by Navigator from *Eucalyptus globulus*, with optimum characteristics for the packaging sector. As far as we are aware, it is the first *Eucalyptus globulus* pulp in the world offering these characteristics. Breaking with conventional wisdom, *Eucalyptus globulus* has now asserted itself as a raw material ideally suited to distinct types of packaging paper, thereby offering an alternative to long fibres from northern Europe and from North America, and also to the use of plastic packaging. Few forestry species, if any, are able to rival *Eucalyptus globulus* for versatility and the ability to vastly improve the quality of such different types of paper, such as hygiene-sanitary papers, printing

## MOZAMBIQUE "First large-scale export operation"

"Portucel Mozambique is making real progress in consolidating its position as a strategic venture, not just for the Group, but also for Mozambique. At the end of the first half of 2021, our subsidiary reached an important landmark in its history when it exported its first major consignment of locally produced timber, from its plantations in Manica province. Two cargo ships sailed from the Port of Beira, one in June and another in October, taking a total of 45 thousand tons of wood, and at the date of this interview a further 25 thousand tons was ready for loading at the port in the first week of January this year. In the years ahead we are planning to continue exports of wood from Manica, and as soon as the logistics are in place, consignments will also be sent from Zambézia. We carried out this pilot large-scale commercial operation in order to test not just the value chain and our internal logistics, but also the quality of the wood. This has the potential to be launch pad for phase 1 of the venture, for which there are plans to establish a wood processing mill in order to export woodchips, which is a geographically much wider and far larger market. This first round of harvesting and exports is especially significant, as it serves to validate the investment in putting Mozambique on the international map in the business of producing and exporting certified wood from planted forests to Asian markets. For example, between now and 2025, China has around 19 projects representing between nine and ten million additional tons of pulp, for which they will need a further 30 million tons of wood, on top of around 15 million tons that the country already imports. At the same time, supply is tending to contract, and this will very likely speed up in future, in the case of some of the regions that currently dominate exports to China, such as Australia, South-East Asia, South Africa and Latin America. In this context, we believe we are well positioned to respond to these new changes in global demand. Having successfully stabilised this phase of the venture, we remain committed to building a modern cellulose pulp mill in Mozambique, substantially increasing the value added in the country's exports." ♦

**"Apart from the traditional applications, Navigator and other companies in the sector are involved in promising R&D projects to generate a wider range of tree-based bioproducts, some of them substituting products currently obtained from petrochemicals."**

The new range of packaging paper, under the gKraft brand, offers a sustainable alternative to single use plastics.



and writing papers, décor papers, special papers for use in filters, tea bags, and now in the packaging sector too.

**How did this project come about? And why now?**

Although it has been producing packaging papers for nearly twenty years, Navigator took advantage of the pandemic period and the fact that some of our machines were shut down to undertake a vast research, development and innovation programme, led by a multidisciplinary team, supported by RAIZ, the Group's own forestry and paper research institute. The idea was to exploit the specific molecular structure and morphology of *Eucalyptus globulus* fibres to develop high-strength, sustainable paper materials, that could offer alternatives to single-use plastics, as well as being safer and more hygienic for the food industry than papers produced from recycled fibres.

Our packaging project can therefore help not only to combat single-use plastics, but also to protect human health. Because the project is highly innovative, it is generating a new portfolio of patents, one of which was filed for publication in June last year. Another two patents are being developed, one at an advanced stage of preparation and the other still at the experimental phase.

**You have referred to the specific features of eucalyptus fibre as a game changer in the world packaging market. Can you explain why? What benefits will people derive from using this packaging?**

The use of virgin *Eucalyptus globulus* fibre, obtained from responsibly managed and duly certified forests, will lead to more efficient use of resources, not just because eucalyptus presents better forestry yields than Scandinavian pine, but also because less wood is needed to make the same quantity of paper. What's more, these plantations help maximise carbon dioxide retention for a given area - annual CO<sub>2</sub> sequestration and oxygen production is three times higher for *Eucalyptus globulus* than for maritime pine.

In addition, as I have already said, this species of eucalyptus is known to allow for more recyclings (ten cycles, as compared to between four and eight for other paper fibres), making it more sustainable.

As regards another more direct benefit to people, I would like to talk about a situation that has attracted little attention in Portugal, but has been the source of wide debate in several European countries. Consumers have to be aware that the use of recycled fibres in contact with food products constitutes a significant risk to public health. This is because of the presence of chemical compounds which are very harmful to



**"We're a bioindustry on the right side of the future."**

human health, such as mineral oils and bisphenol-A, used in some printing inks, and which therefore find their way into recycled papers. Indeed, one of the market segments to which we are selling our gKraft paper is for the production of pizza boxes in Italy, where the law fortunately already limits the use of recycled paper in food packaging. In Portugal, people seem more concerned about limiting the area of eucalyptus plantations, without any technical or scientific basis, than about assessing and protecting the health of our people as regards this specific risk. By its very nature, virgin fibre is safer and offers less risks to public health than recycled paper.

**Is the gKraft launch the first of a series of new products that Navigator is planning to bring onto the market?**

Generally speaking, Portuguese industry has been particularly active in this field of the alternative uses of wood, moving beyond the traditional production of pulp, paper and tissue. The work done by RAIZ and a number of leading Portuguese and international universities, who are The Navigator Company's partners, has been a

prime example of this.

At the same time, scientific research has resulted in growing recognition that raw materials sourced from forests are valid and effective alternatives to carbon-intensive materials, such as plastic, other petroleum derivatives, and even to steel...

**... it's a world of opportunities...**

The possibilities are immense and extremely exciting! Take the example of nanocellulose, the smallest fibrous structure in wood fibres, which offers unique strength and surface properties with vast potential for application. Cellulose, an important structural component of the primary cell walls of plants, has already been dubbed the supermaterial of the future.

Navigator is leading an agenda called "From Fossil to Forest", which includes investing in research under the Recovery and Resilience Plan (RRP). The main focus is on developing brown papers for packaging (the gKraft concept) and, in association with this, producing microfibrillated cellulose to develop mechanical properties in these papers, such as functional barriers (against fats and liquids, among other things).

Another topic being explored with RRP funding, and set to go into industrial production, has to do with moulded cellulose products. This means moulding the pulp into a 3D object, such as trays and receptacles for fresh food or food service, substituting polystyrene.

Our "From Fossil to Forest" agenda also addresses the production of biocomposites, obtained by mixing cellulose fibres with thermoplastic products, in particular bioplastics. These materials have potential in a range of industries, such as packaging, injection for motor industry components, or production of filaments for 3D printing. We are also taking part in other initiatives, under the RRP, for using hydrogen to produce biofuels. The idea here is to use green hydrogen to react with the biogenic CO<sub>2</sub> released in our biomass boilers, in order to produce e-methanol, which can be used by the chemicals industry or as a fuel for maritime transport - this will probably be the fuel of the future for large cargo vessels and cruise ships. But it would also be used to produce jet fuel. I firmly believe that we are a bioindustry on the right side of the future. ♦



# Bioeconomy growing in the forest

The urgent need to fight climate change and decarbonise the economy means that forestry resources are more valuable than ever, and the sector is investing in biotechnologies in order to make more from less. Forests now find themselves in forefront of endeavours to shift from a linear, fossil-based economy to a circular bioeconomy paradigm that works in harmony with nature.

**T**he bioeconomy means producing renewable biological resources and transforming these resources and waste flows into value added products, on the basis of innovative biological principles and processes. This has taken on board three essential concepts from sustainable development: the green economy (resulting in improved human well-being and a fairer society, reducing environmental risks and combating ecological shortages), the circular economy (adopting circular production patterns within an economic system, increasing efficiency in the use of resources, above all urban and industrial waste) and biorefinery (industrial processes that optimise full use of biomass, giving rise to products such as biofuels, electricity and heat, and biomaterials).

The practical implementation of the bioeconomy will be driven by reuse of

forestry biomass and agro-industrial by-products and waste). This will mean better management and protection of forests, with all the associated benefits.

Forests accordingly offer a foundation for sustainable development that ticks all the right boxes: environmental, social and economic. Portugal's woodlands have grown as a result of human intervention, highlighting the virtues of this relationship and underlining the extent to which the protection and improvement of natural capital and ecosystem services can flourish if based on a strong and cohesive social and economic fabric, with producers and companies in the sector taking a responsible management approach to natural heritage, which has the potential generate multiple benefits for local communities, improving their quality of life.

The shift in the economic development paradigm holds out new opportunities for forest-based products and for

reducing our dependence on fossil-based materials, in a development model that conciliated value creation with nature conservation.

Forest-based industries are well placed to implement this transition. In particular, the pulp and paper industry, using a renewable resource as its raw material, tends to be carbon neutral and adopts the best practices of the circular economy. In its "2050 Roadmap to a Low Carbon Bioeconomy", CEPI (Confederation of European Paper Industries) predicts an increase in the sectors Gross Value Added (GVA) of 50% by 2050, with 40% of this increase coming from new bioproducts (other than pulp and paper).

In Portugal, projects like Inpactus - run by a consortium of The Navigator Company, RAIZ and the universities of Aveiro and Coimbra, with participation by other universities and research centres in Portugal and abroad - are contributing to a strategic plan in which pulp and paper

mills will gradually evolve into forest-based biorefineries.

For example, composites (fibre/thermoplastics), bioethanol from forestry waste and essential oils are three areas where research and development are in progress and which will shortly generate new business ventures and skilled employment, as part of a bioeconomy based on Portugal's woodlands.

The report issued by BIC (Bio-based Industries Consortium) in March 2021, entitled "Mapping Portugal's bio-based potential", considers that Portugal is excellently placed to lead the transition to a bioeconomy in Europe, and identifies the "food and drink", "pulp and paper" and "wood processing" industries as three sectors able to drive this transformation in the country.

This is a challenge on a planetary scale. But the forest is there to make the journey with us. As always. ♦

**Forests offer a foundation for sustainable development that ticks all the right boxes: environmental, social and economic.**

# The future of bioproducts features a supermaterial

In the transition to the bioeconomy, which is a component of sustainable development models, forests are on the right side of the equation. And research funded by the paper industry is creating the materials of the future from cellulose.



**T**he bioeconomy (based on bioproducts made from natural and renewable resources, substituting fossil resources) and the circular economy (reusing by-products and waste) are two fundamental concepts for a sustainable, low-carbon future, without exhausting the planet's resources.

In this balancing game between the inevitable increase in demand for raw materials and the supply of environmentally friendly materials, forests are the natural solution, and planted forests that are well managed and replanted are the sustainable solution. "Forest-based bioproducts are not an option, they're our only choice, because we have to travel towards decarbonising the economy, using renewable products such as wood and its derivatives, which

are biodegradable, recyclable and carbon neutral. It's an imperative", acknowledged Carlos Pascoal Neto, general manager of RAIZ, the forest and paper research institute majority funded by The Navigator Company, and part of Portugal's Science and Technology System.

The starting point for the research and development work at RAIZ, in partnership with universities and other national and international institutes, is what is regarded as the supermaterial of the future - cellulose - and also by-products from the pulp and paper industry. This is the central strength of Navigator's strategy for creating sustainable value, seeking to help speed up the transition from a linear, fossil-based economy, with finite resources and damaging to the climate, to a circular bioeconomy in harmony with nature and carbon neutral.

Cellulose fibres



## The pulp and paper mill is a real biorefinery

"The production process for pulp and paper is fundamentally circular because, in the industrial transformation, around 50% of the raw material (wood) used results in pulp, the other half is converted into a by-product with great potential for reuse, which is called black liquor, explained Carlos Pascoal Neto, general manager of RAIZ, Navigatoros forest and paper research institute.

In today's mills, black liquor is burned to regenerate the chemical products from the process and to produce steam, part of which is then converted into green electricity. If part of this liquor is not sent for burning, it can be used to recover the lignin dissolved in it, which can be converted into several bioproducts. Something else that can be extracted from black liquor is biomethanol, an industrial by-product that can be used as a biofuel or in the chemicals industry.

It is also possible to set up parallel processes at a mill to deconstruct wood/biomass, in order to separate it into cellulose, hemicellulose, lignin and extractables (such as essences), which can then be used to produce bioproducts, biochemicals and biofuels, to replace those currently sourced from petrochemicals. What is more, some of these bioproducts, in particular micro and nanocelluloses, can also be incorporated into traditional products in the paper sector, such as tissue and packaging, creating distinctive goods. ♦

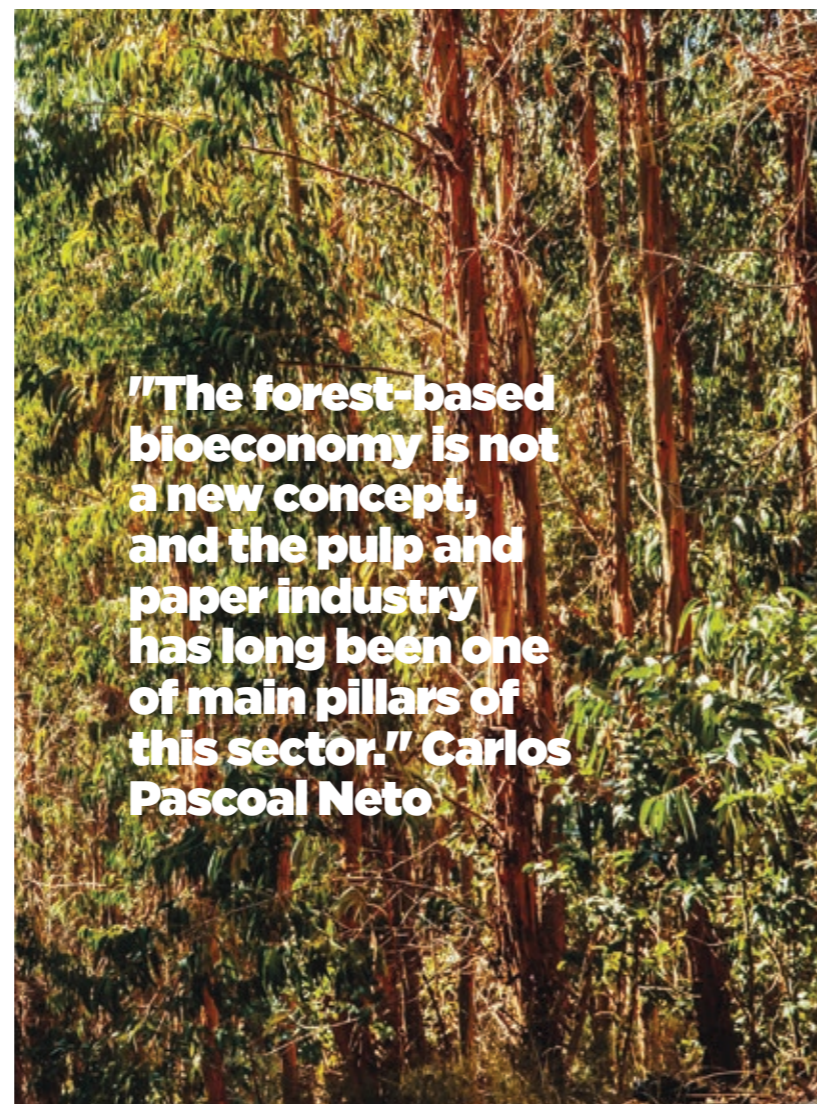


Granulated pulp

### What makes it a supermaterial?

The superpower of cellulose fibres, which in wood are measured in millimetres, is that they can be deconstructed into micro and nanocellulose. At the molecular and microscopic scale, this material reveals new properties, including unique levels of mechanical strength and surface properties. This opens up a range of applications for this natural material in bioproducts which can potentially substitute all carbon-intensive materials, which are currently produced from petrochemicals (such as plastic, construction materials, textiles, fuels and chemicals). It means it can be used in sectors ranging from the cosmetics and pharmaceutical industry to aeronautics, as well as in electronics and 3D printing.

On the strength of "upscaling, with a view to economic viability", the market may in the near future offer food and prebiotic supplements created from cellulose, as well as food additives, such as thickeners, or transparent film for packaging or



**"The forest-based bioeconomy is not a new concept, and the pulp and paper industry has long been one of main pillars of this sector." Carlos Pascoal Neto**

flexible electronics, predicted the general manager of RAIZ. The same is true for other components of wood or by-products from the pulp and paper production process, which may be processed, for examples, into polyurethane foams for heat insulation, resins and adhesives.

"Demand is also expected to rise sharply for cellulose-based textile fibres, because we cannot continue to depend on cotton or fossil-based synthetic fibres", explained Carlos Pascoal Neto.

The head of RAIZ also told us that there are already concrete examples of biocomposites based on cellulose fibre being used in the automotive industry, for example. And a whole new industry is growing up around biofuels derived from waste cellulose biomass: "Consumption of bioethanol will continue to grow in importance, replacing fossil fuels in land-based mobility, competing with electric mobility or hydrogen. And in the future, cellulose-based liquid

fuels will continue to play a part in air and maritime transport", he predicted. "Bioethanol, in particular, will be very important as a chemical precursor of many products, in particular bioethylene and the biopolyethylene derived from it".

"These products are the basis of what is called the 'new bioeconomy'. The forest-based bioeconomy is not a new concept, and the pulp and paper industry has long been one of main pillars of this sector. The challenge today is to transform industrial units into real biorefineries that comprehensively and rationally convert all the wood and biomass entering the mill into pulp, paper, energy and bioproducts that can substitute fossil-based products", explained Carlos Pascoal Neto.

The bioeconomy and the circular economy are two fundamental concepts for us to be able to respond to the expected growth in population and consequent increase in demand for products, without compromising the future of the planet and of humanity. ♦



### The NCV concept

The Nano Cellulose Vehicle (NCV) was presented in 2019 at the Tokyo Motor Show. This is a supercar built from cellulose nanofibres, created by a consortium of 22 Japanese universities, research institutes and companies. The aim was to reduce the weight of the vehicle (it's five times lighter than steel, and five times stronger) and to arrive at a car with a carbon neutral life cycle and that can be recycled.



See the video of the NCV presentation.

# New cellulose applications: from food additives to aeronautics parts

Using eucalyptus and by-products from paper manufacture, the RAIZ - Forest and Paper Research Institute and its partners are developing ecological bioproducts for a circular economy.

## Nutraceuticals, cosmetics and health BIOACTIVE COMPOUNDS

Chemicals extracted from the eucalyptus leaves and bark - those which are biologically active, meaning they have an effect on our own biological system, such as essential oils, triterpenes and phenols - can be used in the cosmetics industry, in perfumes and in nutraceutical and pharmaceutical products. This research is being conducted in partnership with the universities of Aveiro and Coimbra. The potential of some of these chemicals for delaying the onset of Alzheimer's disease, for example, is being studied by the University of Coimbra.



Substances that serve as substrate for certain intestinal micro-organisms, encouraging the multiplication of bacteria beneficial to digestion, obtained from carbohydrates present in the walls of plant cells.

## Nutraceuticals PREBIOTICS

Traditional white pulp, which is used to make printing and writing paper and tissue, can also yield bioproducts of interest for human health such as prebiotics based on hemicellulose. Once extracted and purified, they can be used as a food supplement to regulate intestinal flora. A project in partnership with the Higher Technical Institute, with additional support from the University of the Minho.



## Biofuels and bioplastics SUGARS

Waste biomass, when treated using enzymatic hydrolysis, as well as primary sludges (a waste products from mills, rich in cellulose fibres), can be used to obtain sugars, the constituent elements of cellulose and hemicellulose (which can represent up to around 70% of forestry biomass). Sugars derived from cellulose can be used to produce second generation bioethanol, i.e., without consuming resources that can be used for food production, such as in the case of starch, obtained from cereals. This project is being researched in partnership with the universities of Aveiro and Coimbra, and with support from LNEG (National Energy and Geology Laboratory). The sugars can also be fed to certain micro-organisms that convert them into biodegradable bioplastics, such as polyhydroxyalkanoates (PHAs). This second research field is being developed in partnership with Universidade Nova de Lisboa and the BIOREF collaborative laboratory.

Chemical reaction whereby an enzyme breaks down a molecule into other smaller molecules, using water.



## Cosmetics, food and paper BACTERIAL CELLULOSE

When sugars are converted into cellulose by bacteria, the result is a unique structure with an extremely high level of purity, on a nanometric scale (1 millimetre = 1,000,000 nanometres), which is being explored in partnership with the universities of the Minho and Aveiro, and with the start-up Satisfibre. The applications range from gels for cosmetics, making it possible to create slow-release face masks, to food additives, such as thickeners (ice creams, for instance, can be made creamier, without pumping up the calories). They can also be used to enhance paper products, improving their mechanical or barrier properties. Away from RAIZ, bacterial cellulose membranes can already be found on the market for use as artificial skin in burns patients and for other medical applications.



## Construction, food and packaging LIGNIN

This component of wood, when extracted from the black liquor resulting from cooking paper pulp, can be used to produce polyurethane foams suitable for thermal and acoustic insulation, adhesives (glues), cements and packaging. This research is in partnership with the University of Aveiro. A collaborative project in the past with the University of Porto looked at converting lignin into vanillin, one of the main elements of artificial vanilla aromas, traditionally produced from petrochemical sources. Black liquor lignin can also be used to make carbon fibre, a highly strong ultralight material, used in the automotive industry, in tennis rackets and bicycles.



## Automotive industry, injection, moulding and packaging BIOCOMPOSITES

These are the cellulose-based bioproducts closest to going into industrial production and are made by combining fibres, or pulp, with plastics, whilst maintaining the same functions. This project is in partnership with the University of Aveiro, with support from other entities, such as PIEP (Centre for Innovation in Polymer Engineering), at the University of the Minho. If the plastic used is a bioplastic created from cellulose sugars, the product is totally biodegradable and renewable. Biocomposite pellets resulting from this research are processed in the plastics industry using a variety of technologies, including extrusion or thermoforming, to create products ranging from automotive and aeronautical components to pieces such as vases, kitchen utensils, toys and packaging, or for producing filaments for 3D printing, thereby reducing the proportion of plastics in the end product, and keeping it recyclable.

# Naturally wrapped in paper

The Navigator Company launched a new packaging paper solution that uses virgin *Eucalyptus globulus* fibre. This opens a completely new door to efficiently substituting plastics in market segments more dependent on these fossil-based materials.

It's called gKraft and it's The Navigator Company's new paper for the packaging market, designed to help accelerate the transition from using plastics to using natural, sustainable, recyclable and biodegradable fibres, once again making clear the company's commitment to protecting the environment.

Epitomising the "From Fossil to Forest" concept, this new paper offers the chance to cut the use of fossil-based materials, such as most plastics, and to opt for renewable and biodegradable forest-based materials.

"The Navigator Company is being disruptive, by using *eucalyptus globulus* to produce packaging, offering the market the advantages of sustainability, whilst also responding to the needs of packaging manufacturers", said João Escoval, the company's brand manager.

gKraft was developed thinking of the specific needs of the packaging sector, and divides into three sub-brands. FLEX was designed for developing flexible packaging for the food industry, food service and the pharmaceutical trade. BAG is intended for packaging in the retail trade (and is already

being used by big international brands such as Zara, Victoria's Secret, Desigual, Nike, Museu Cristiano Ronaldo and Real Madrid). And BOX (focusing on corrugated cardboard boxes) is ideal when stronger packaging is needed, in manufacturing and retail, especially in food retail.

### Competitive advantages

"Virgin *Eucalyptus globulus* fibre, which has put Portugal and The Navigator Company on the map for producing quality paper, is what makes gKraft different from the traditional paper used in the packaging market", explained João Escoval.

Thanks to research supported by RAIZ, the company's forest and paper research institute [see insert "Innovating for the environment"], Navigator has created a lighter alternative offering the same strength, able to meet the demands of protecting and transporting packaging. According to João Escoval, gKraft offers packaging manufacturers "easy workability on the production line, with a different thickness and rigidity, allowing for better machining and a smoothness that offers the best printing quality, adding value to branding and brand communication".

"Kraft" refers to the production process used, in which the fibres take on optimum mechanical properties and greater strength. The letter "g" refers to *globulus* (the eucalyptus species used) and to other characteristics of the paper - good, green, gifted, game changer, guaranteed results, growth.



See the new gKraft launch video.



The use of virgin *Eucalyptus globulus* fibre, obtained from duly certified responsibly managed forests, means that resources are used efficiently on a "More with Less" basis. In other words, the same number of square metres of forest yields a larger number of square metres of paper bags or boxes. This is possible not only because yields in eucalyptus forests are higher – five to seven times higher – than for Scandinavian pine –, but also because a smaller quantity of wood is needed for the same quantity of paper. What is more, *globulus* has a faster turnover, helping to maximise retention of carbon dioxide in the same area.

Because of its morphology, this eucalyptus species is also acknowledged to allow for more recyclings, presenting a recyclability rate far higher than for other paper fibres. This has been demonstrated in a number of laboratory studies conducted by RAIZ, Navigator's forest and paper research institute, in collaboration with Portuguese universities.

**A question of safety**

Food safety and hygiene are other benefits that gKraft brings to the packaging market, by using only virgin fibre. This new range of paper is safer and more hygienic in contact with skin and with food, in particular in comparison with recycled papers which, because they contain harmful chemicals, have already been banned in some European countries wherever there is direct contact with food.

In order to guarantee optimum safety and hygiene, The Navigator Company has had gKraft papers approved for contact with food by ISEGA, the German certification institute for packaging products, and also with InnovHub in Milan.

The use of virgin fibre also has the great advantage of feeding the recycling cycle, which needs this input, as recycled fibre gradually deteriorates until it can no longer be reused.



Laboratory trials by RAIZ have confirmed that *Eucalyptus globulus* has a much higher recyclability rate than other paper fibres.

**“When a tree is harvested, the carbon ceases to be stored in the forest, but it stays in the products made from wood, such as paper and cardboard.”**

(FAQ, “Carbon Storage and Climate Change Mitigation Potential of Harvested Wood Products”, 2021)

## Innovating for the environment

Although it has produced packaging papers for almost twenty years, The Navigator Company took advantage of the pandemic period to conduct a research, development and innovation programme, led by a multidisciplinary team and supported by RAIZ - Forest and Paper Research Institute.

Starting out from the specific features of the molecular structure and morphology of *Eucalyptus globulus* fibres, the team succeeded in “optimising pulp production, so as to maximise yields and minimise specific consumption of wood, whilst at the same time maximising the pulp’s mechanical properties”, explained Carlos Pascoal Neto, general manager of RAIZ. The aim: to develop strong and sustainable products paper materials, suited to packaging.

The project is generating a new portfolio of patents, with the first application being filed in June 2021. Another patent is at an advanced stage of preparation, and a third is at the experimental stage.

Looking ahead, RAIZ is currently working on research and development of papers with functional barriers (against fats, liquids, oxygen and other substances), such as those used in fast food chains, for cups and plates, or for straws, all of which are recyclable, biodegradable or compostable. “Recent market solution as mostly hybrids, incorporating petrochemical-based components. We’re developing and exploring alternative solutions with products 100% derived from renewable resources”, explained Carlos Pascoal Neto. ♦

WE'RE TURNING PACKAGING INTO A FORCE FOR CHANGE

**gKRAFT**  
GLOBAL LEADER IN RESPONSIBLE PAPER MAKING

## FROM FOSSIL TO FOREST

### Guarantee of quality

Based on the From Fossil to Forest concept, reflecting the company's strategy aligned with its purpose of creating sustainable value for its shareholders and for society as a whole, The Navigator Company's new gKraft line represents significant progress in offering packaging alternatives that help other organisations to achieve their goals, for the environment, and for food safety and hygiene.

Navigator accordingly provides a quality seal which can be used by all producers that use gKraft as a raw material, underlining their commitment to building a better world and assuring consumers that the packaging uses this paper and its associated benefits: a natural, recyclable and biodegradable solution, that helps

to increase carbon retention, to produce oxygen, protect biodiversity, fertilise the soil and combat climate change.

This seal also guarantees that the products do not incorporate recycled fibres, and are therefore free of the associated contaminants, making them suitable for contact with food.

Aligned with international goals of sustainable development and committed to contributing to solutions that create environmental, social and economic value, The Navigator Company's new business area offers a way in which all of us can opt for natural, non-fossil packaging solutions, helping to minimise the problems of plastics in the environment, and consequently helping in the fight against climate change. ♦

## In 2020, the European recycling rate for paper and cardboard was 73.9%.

(European Paper Recycling Council, Monitoring Report 2020)

The fact that only virgin fibre is used ensures that gKraft offers improved food safety and hygiene.



## The European paper industry has cut its carbon emissions by 26% since 2005.

(CEPI, "Key Statistics 2020")



## The urgency of substituting plastics

The scale of the problem lies in the more than 380 million tons of plastic produced each year. Around 50% of this non-biodegradable material is used in objects which are used only once, but then stay on the planet for hundreds of years.

According to figures from Plastic Oceans, a non-profit organisation, only 9% of the plastic made since 1950 has been recycled and, each year, 10 million tons of this waste ends up in the ocean, where it cannot be collected and breaks up into microplastics that contaminate the food chain. Given that packaging currently represents the largest market for plastics (more than 40% - in bags alone, more than a million units are used every minute around the world, in other words, 500 thousand a year, each used for an average of 15 minutes), and in view of the low level of recyclability of this material and the fact that it is based on a fossil raw material, there is an urgent need to develop solutions better suited to a circular, low-carbon economy, which is where products derived from cellulose and paper come in. ♦



## Smart packaging

Paper offering strength and printing quality, like gKraft, can potentially have a positive impact on the development of more environmentally friendly smart packaging, by integrating ecological electronic devices, printed directly onto the paper and/or consisting partly of cellulose, substituting traditional electronics, the sustainability and circularity of which is increasingly questioned.

The potential uses of The Navigator Company's different papers are being explored by the AlmaScience collaborative laboratory, where one of the research areas focuses on developing sustainable solutions for smart packaging (for tracking in logistics, or with sensors to improve food safety and reduce waste). "Because cellulose is the most plentiful biopolymer on the planet, and is biodegradable and compostable, it makes a lot of sense to replace plastic with paper solutions", said Luís Pereira, CTO of AlmaScience and a lecturer at the Faculty of Science and Technology at Universidade Nova de Lisboa. ♦



# Sustainability from A to Z

The first steps to defining the concept of sustainability were taken at the United Nations Conference on the Human Environment, in June 1972, in Stockholm (Sweden) – the first UN conference on environmental issues and the first major international gathering to discuss the impact of human activities on the environment. Some years later, in 1987, the United Nations' Brundtland Commission defined sustainable development as "development that meets the needs of the present without compromising the ability of generations to come to meet their own needs". This makes it a recent addition to our vocabulary, and one that encompasses an array of contemporary ideas and concepts. So you don't lose your way in an ocean of confused ideas and opaque acronyms, we've decoded the essentials.

## Climate change

Changes in the climate on a global scale, persisting over long periods of time, affecting the balance of systems and ecosystems. They may be due to natural causes or the result of human activities with effects on the composition of the atmosphere.

## Global warming

Observable increase in temperatures in the whole planet (in the atmosphere and oceans), as a result of the accumulation of carbon dioxide and other greenhouse gases. This is the most visible face of climate change.

## Anthropogenic (anthropogenic impact on the environment)

Any effect caused by or resulting from human action. Examples of environmental impacts resulting from this action are increasing greenhouse gases, the presence of plastics in the environment, loss of biodiversity in ecosystems and deforestation.

## Anthropocene

(Unofficial) geological period, corresponding to the most recent period in the Earth's history, in which human activities have started to have a significant impact on the planet's climate and on the functioning of ecosystems. Some scientists, in particular Eugene F. Stoermer, to whom the term is attributed, and the Nobel laureate Paul Crutzen, who has popularised it, argue that the Holocene – the geological epoch corresponding to approximately the last 12 thousand years of the Earth's history – has ended.

## Bioeconomy

Use of renewable natural resources, combined with new technologies, to innovate processes and products in all sectors, with a view to a sustainable economy. By bringing together all sectors and systems in a chain based on biological resources, the bioeconomy is preparing the way for a more innovative and competitive society, more efficient in the use sustainable use of renewable resources for industrial purposes and in protecting the environment.

## Biocapacity (or biological capacity)

The capacity of an area to produce renewable resources continuously and to absorb and/or filter the waste produced by human beings. Expressed in total hectares per person, meaning that it is pegged to the human population.

## Biomass

Renewable energy source derived from organic matter, animal or vegetable. Examples of this are wood and forest waste, agricultural waste or manure. It can be burned directly, to generate heat or electricity, or converted into oil or gas, for producing biofuels.

## Biodegradable

Natural process of decomposition, by micro-organisms present in the environment (fungi, bacteria and others). The biodegradation process, through to complete disappearance of the materials, depends on factors such as location, temperature and humidity.



## Biodiversity (or biological diversity)

The various different species of living beings that live in a region, and the relations between them. Fundamental to the balance of all ecosystems on our planet, this plays a crucial role in the environment, the economy, society and even culture.

## Natural capital

Stock or quantity of renewable or non-renewable natural resources (plants, animals, air, water, soil, minerals...), from which people derive benefits, such as food, energy, medicines, or equally important services, albeit invisible, such as oxygen production, temperature regulation or carbon sequestration.

## CO<sub>2</sub> equivalent

International measurement expressing the quantity, in the form of carbon dioxide (CO<sub>2</sub>), of global heating potential of other greenhouse gases.

## Fossil fuels

Petroleum, coal and natural gas. These are the result of a very slow process of decomposition of plants and animals. Much of the fuel we use today was formed millions of years ago and is not renewable in a human timescale. The burning of these fuels is regarded as one of the causes of the greenhouse effect and global warming.

**Fair trade**

A model of trade that puts people and social, economic and environmental sustainability at the centre. The aim is to provide decent work, to respect the environment and encourage responsible and sustainable management of natural resources.

**COP (Conference of Parties)**

Supreme decision-making body under the United Nations Framework Convention on Climate Change (UNFCCC), comprising 197 countries, including Portugal, meeting every two years. The 26th COP (COP26) was held last year, in early November, in Glasgow, with the aim of stepping up action to combat global warming.

**ESG Criteria**

From the acronym standing for Environmental, Social and Governance. ESG criteria are used to measure the sustainability performance of an organisation and how it is creating sustainable value. Investors use ESG ratings to assess whether, in addition to its financial health and profitability, a company generates a positive impact on society and the environment.

**Sustainable development**

The capacity to meet the needs of the current generation without compromising the needs of future generations, seeking to conciliate economic development and environmental conservation.

**Eco-friendly**

Used to describe attitudes that are ecologically correct and to indicate that products or services are sustainable.

**Circular Economy**

Closed economic model, focused on eliminating waste. Replacing the linear economy concept (based on extracting, producing and discarding), the circular economy invests in circular flows involving reuse, restoration and renewal, in an integrated process that promotes economic growth and the sustainability of resources.

**Ecosystem**

Community of living beings that coexist in a given place and interact with each other and with the environment around them, forming a stable system.

**Renewable energy**

Sources of energy derived from renewable natural resources, such as wind, solar (sun), tides, biomass (organic matter) and geothermal (the Earth's internal heat), which can be regenerated sustainably in a short space of time.

**FSC® (Forest Stewardship Council)**

International forest certification system, promoting responsible forestry management. Set up in the wake of the 1992 UN conference on sustainable development, in response to concerns about global deforestation.

**GHG (Greenhouse gases)**

Atmospheric gases that hinder or impede the dispersal into space of the sun's rays reflected by Earth. On the one hand, it is the greenhouse effect that makes it possible to maintain a temperature compatible with life on Earth. However, growing man made emissions of these gases has caused levels of concentration in the atmosphere to rise too high, resulting in over-heating of the planet. The most harmful are: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and hydrofluorocarbons (CFCs).

**Sustainable management**

Ability to direct the affairs of a company or society, through processes that renew and add value to all forms of human, natural and financial capital.

**Sustainable forestry management**

Seeks to make professional use of forests on an environmentally appropriate, socially beneficial and economically viable basis. In other words, this entails a pace of product compatible with maintaining biodiversity and the capacity of natural resources to regenerate, in order to safeguard the ecological, economic and social functions of forests, now and in the future.

**Environmental impact**

Alteration of conditions in the environment, or of elements thereof, as a consequence of human activities, normally causing harm to ecosystems.

**IPCC (Intergovernmental Panel on Climate Change)**

Set up by the United Nations in 1988. This is a scientific body that searches for, gathers and disseminates knowledge of the current state of climate change, and of its impacts and the options for adaptation and mitigation in response to such change.

**Mitigation (of climate change)**

Action in response to climate change that consists of reducing emissions of greenhouse gases and increasing carbon sinks and natural systems, such as forests, that absorb more carbon than they emit.

**Carbon neutrality**

The point of equilibrium, or zero balance, between greenhouse gas emissions and sequestration of these gases from the atmosphere (through forests, for example). Portugal wants to achieve this target by 2050, and several companies have set in motion their own roadmaps to carbon neutrality.

**SDGs (Sustainable Development Goals)**

The United Nations has established 17 goals for sustainable development. In short, these call for action to end poverty, protect the environment and the climate, and seek to ensure that people worldwide can enjoy peace and prosperity.

The Navigator Company has brought forward this target by 15 years, committing itself to achieving carbon neutrality at its complexes by 2035.

**PEFCTM (Programme for the Endorsement of Forest Certification)**

Forest certification programme, set up in the late 1990s, to promote sustainable management of forests and the chain of custody.

**Carbon footprint**

Represents the total volume of greenhouse gases - expressed in CO<sub>2</sub> equivalent - generated by mankind's economic and everyday activities. On a personal level, this refers to the emissions that an individual causes through his or her everyday mobility, diet, clothing, etc.

**Natural resources**

Elements taken from nature to meet the needs (food, development, comfort, etc.) of living beings. Natural resources are biological (from animal and plant sources), geological (rocks or other ores), soil resources, climatic (radiation, solar, wind, precipitation) and water resources (availability of water in oceans, seas, rivers, etc.).

**Carbon sequestration**

Process of capturing large quantities of carbon dioxide in the atmosphere, occurring above all in forests and oceans, through photosynthesis.

**UNEP (United Nations Environment Programme)**

The United Nations Environment Programme is the leading global environmental authority that sets the international agenda on the environment, with programmes focused on the climate, wildlife, pollution and sustainable development, among other things.

**WBCSD/BCSD Portugal (World Business Council for Sustainable Development)**

Global organisation comprising CEOs of more than 200 companies that are actively committed to the transition to a sustainable world. One of the members of the global WBCSD network is BCSD Portugal, representing more than 120 leading Portuguese corporations, committed to the same goal at national level.

**FIA (Forest Intervention Area)**

Territorial area consisting mostly of woodlands, subject to a Forestry Management Plan that complies with the requirements of Municipal Forest Fire Defence Plans. It is managed by a single entity. ♦

The Navigator Company sits on the WBCSD's Executive Committee and has been a very active member of its Forest Solutions Group, which debates forestry issues within the organisation. It has taken the same position in BCSD Portugal, where it currently chairs the management board.



Forests are the largest terrestrial CO<sub>2</sub> sink.

# Important small gestures

Environmentally friendly gestures are gaining visibility. Choices, habits and attitudes that might appear insignificant, but which end up having a major impact on the planet, when replicated and added together. From riding a bicycle to reusing clothes, picking up litter, saving water or cutting down on air travel. There's any number of examples. All of them worthwhile.

## “The important thing is the impact of our behaviour”

André Correia and Cristina Sousa

**T**hey swapped their car for a bicycle and public transport. They reuse clothes, buy unpackaged good, compost their waste, pick up litter, avoid plastic containers and only buy what they need. Gestures that have a real knock-on effect because, as they say, “caring about the environment is contagious”.

André Correia, 46 years old, sales officer, spent two years thinking about it. He even tried out the route on his days off. In March 2020, it finally clicked: he sold his car and start cycling to work. This means going from one end of Lisbon to the other (he lives close to Belém and works at the airport) - a cycle ride of 32 kilometres that he enjoys. “Sometimes I go along the river, but there are days when I feel like going through the city”, he says.

This gesture to help the environment enabled him to realise that “it's not such a terrible and difficult change to give up your car for getting around Lisbon”, he told us. Apart from a few adjustments, like a rainproof jacket for bad weather, “it's not such a big change to your life”

and as well as being more sustainable, “it's also much healthier”.

His wife, Cristina Sousa, project manager, has also joined him on two wheels, although she confesses she is not confident enough to cycle up to Campo de Ourique, where she works. “I ride a bicycle, but just here in our neighbourhood”. As for other trips, they manage nearly everything “with a travel pass”.

Mobility is just one area where they are eco-conscious. For instance, they reuse clothes from friends and family, because, as Cristina explains, “the textile industry is a major polluter: it's throw-away consumerism, which has a huge negative impact”. She smiles as she tells us: “My daughter is five years old and we only once bought her a t-shirt when she was a baby!”.

But that's not all. They buy unpackaged food, opt mostly for local produce and vegetarian meals, compost their waste, volunteer to pick up litter and avoid plastic packaging (they use solid shampoo and wash their clothes with ecological detergent strips).



André and Cristina sold their car and started to use bicycles to get around.

Cristina has always championed the environmental cause. She studied forestry engineering and got involved at a young age in environmentalist movements and conservation causes. “Sustainability has been a concern of mine for a long time”. In late 2017, she was a co-founder of Zero Waste Lab, “an association working for zero waste, to change consumer habits and behaviours, looking at our individual impacts and our relationship with things”.

### Gestures that encourage others

Her involvement in Zero Waste Lab made her even more aware of the need to do something about the environment. And above all, it helped her to realise that this awareness “is contagious”. In other words, “the important thing is the dynamic we create through our own behaviour, rather than, for example, counting exactly how much carbon we emit”. She gave us an example: “When I go around picking up cigarette ends in the street, people are amazed to see the bin fill up; and one time that I went to the supermarket to buy cheese with the container I brought from home, there was a lady who said: ‘Can I also bring

my own? I'm going to do that too!’”. André has had the same experience. “When I started arriving at work with my bicycle helmet, the other staff were immediately interested and curious, and wanted to know more.”

Catarina and André believe their examples can inspire others and “alert people to the issue”. And it's even quite easy: “They say it takes 28 days to form a habit. So you just need to get through 28 days...”, smiled Cristina. ♦



And when, for some reason, it's not practical to cycle, public transport can resolve the issue.

## “It’s a tiny grain of sand”

Catarina Soares

**F**or twenty years she’s been collecting rubbish on the beaches she loves. She is careful to buy only what she needs and to use as little plastic as possible. Small gestures that give her the satisfaction of “feeling that I’m doing something”.

Catarina Soares, translator, was born in Lisbon 49 years ago, but for more than 20 she has lived in Torres Vedras. She’s always felt a strong connection with the sea - she loves surfing, kayaking, diving, snorkelling and just being on the beach. And when she’s in the water, she always looks out for wildlife. “We have a fabulous coastline, which is tremendously diverse. But when you look at the fish and the seaweed, it’s not always a pretty sight, it’s really sad”, she told us. “I once saw a blue shark trying to nibble at seaweed, with a rope caught around its mouth”.

In order to “do something about this terrible problem”, she started years ago to pick up rubbish on beaches. Generally on the beaches close to home, at Assenta and Praia da Foz, but she told us, “whenever I’m on a beach and I see litter, I pick it up”. The numbers are impressive: in 2019 alone, she went on 182 clean-up expeditions, and collected 10,281 litres of rubbish. The things she finds vary from metal buoys to various types of plastic. Some of them are quite old - she finds free gifts from ice cream brands and soft drink tops from the 1960s and 70s. Others have been washed across the ocean by currents, including fishing tackle used on the eastern seaboard of the United States.

The variety of rubbish she has collected on the beaches of Torres Vedras formed the subject of an exhibition - “What rubbish is there on your beach?” - at the Environmental Education Centre in Torres Vedras. “It was another way of raising awareness of this big problem”, she explained.

### “I only buy what I need”

As well as cleaning up beaches, Catarina Soares has long had an environmentally friendly lifestyle. “I’m vegan, I only buy what I need, and I’ve cut right down on the plastic I consume”, she told us. As for consuming less, she explained: “I no longer buy something just because it catches my eye; I only buy essentials”.

A philosophy that she applies to her clothes and accessories, and to how she furnishes her house. “It’s very hard to cut down on plastic - televisions, computers, mobile phones, everything has plastics”, she explained, but Catarina has long



In 2019 (before the pandemic, when she was freer to get about), Catarina collected 10,281 litres of rubbish from beaches.

since given up using plastic objects like bags, chopping boards or cotton buds with plastic stems.

“Today, I couldn’t live any other way”, she confesses, although she acknowledges that her contribution “is just a tiny grain of sand”. But she is at least happy “not to be making the problem worse”. ♦

## “When you add up people’s individual impacts, it makes a difference”

Júlia Vaz

**S**he started by giving up meat. Then she started using products without chemicals, buying secondhand clothes, cutting down on the plastic she consumed, choosing brands with sustainable packaging... Today, she even makes her own deodorant. It might not seem a lot, but “when you add up people’s individual impacts, it makes a difference”.

It all started in 2016. Júlia Vaz, 29 years old, a student of Welfare Policy, started to work for an organisation in Brazil that implemented socially sustainable technology. “I started to have more contact with environmental issues and, one year later, I started making lifestyle changes”, she told us.

The first step was giving up meat, and then going vegan. She got more and more interested in the environment, found out about the issues and ended up changing her lifestyle.

“When you make a lifestyle change to help the environment, it’s very natural for others to follow”, she explained. “I started using cruelty free products and natural products without chemicals, buying second-hand clothes, using reusable bags, cutting my consumption of plastic and cotton, supporting the circular economy, choosing brands with more sustainable packaging... And I try to consume as little as possible, not changing my phone just because there’s a new model, or being a slave to fashion”.

Júlia believes that if we all make a lifestyle change to save the environment, however small, it all adds up to something important.



She admits that all this might seem insignificant, but points out that “if everyone thinks like that, no one will make any changes to their lifestyle”. “One person might not seem much, but the truth is that there are people all over the world trying to change things”, she went on, convinced that “when you add them up, people’s individual impacts make a difference”. What’s more, she says, “we have to do what we think is right, regardless of how little it may look to us”.

Júlia likes to “persuade through her own example”. She shares vegan recipes, tells people about her experience, explains her arguments. “Just as incredible people encouraged me and made me aware of my own consumption, I believe I have done the same with some of my friends”.

Optimistic, she believes that the younger generation “is better informed, more politicised and active”, and has noticed “they are more collectively aware, which has a direct effect on environmentally friendly habits”. She told us confidently: “Information on environmental issues is discussed more widely today and is more relevant. It’s been carefully compiled, as it should be, and it’s opening the eyes of young people, who have started to fight for the planet”. ♦

## “People want to change, but don’t know how”

Leonor Guedes

**S**he decided that emissions from flights were most to blame for her carbon footprint. So she gave up flying and took the train. “We can only make a conscious lifestyle change when we know how we’re causing a negative impact”. But “people need to be educated”, she says.

Having lived outside Portugal for four years (first in Hong Kong, and now in Vienna), and been a frequent flyer for seven years, Leonor Guedes, 28 years of age, wanted to know more about her carbon footprint. “I work in a start-up focused on climate change and I learned a lot about the impact of our choices and what we can do to reduce that impact”, she told us, explaining that “one of the things that most affects our footprint is the way we get around”.

She did the maths – “there are lots of apps to help”, she said – and concluded that most of her carbon emissions were caused by flying. “I’ve always flown a lot, not just because of living abroad, but also because I love to travel”, she said. Confronted with the true cost of flying, she took a decision: “To cut right down on how often I fly. I try to fly only to Portugal (from here it would be difficult to travel in any other way), and when I go on holiday, I take a train”.

As she lives at the centre of Europe, rail ends up being a relatively easy option. She’s already gone by rail to the Czech Republic, Poland, Slovenia, Italy and Germany, and now she loves it. Especially overnight trips, in a sleeper train with breakfast. “You don’t need to get up really early to catch your flight, you arrive feeling more relaxed, and there’s no baggage limit!”, she laughs. As for her other travel needs, she gets round Austria by train, and in Vienna goes by public transport or rides a bicycle.

### “People need to be educated”

Her calculations showed here that the other “big negative impact” on her carbon footprint was her diet, so she decided to give up meat. But that’s not all she does for the sake of sustainability. “I only buy what I really need”, she says. A philosophy she tries to apply to almost all non-essentials, from clothes to electronics.

But, she insists, decisions like this need thought and guidance. “We can only make a conscious

decision to cut down when we know where we’re making a negative impact”, she says. Using herself as an example, she explained that “the two big negative impacts in my life don’t apply to everyone”.

To help people make conscious changes, “they need to be educated”, she argued. Because “people want to change, but don’t know how”. Leonor knows what she’s talking about. She works in a company that provides educational programmes to help change these forms of behaviour in companies. Although people are receptive to the ideas, she is aware that “a lot of education is needed” in this area.

“These decisions have to become a habit, and that only happens when people realise the importance they have”, she stressed. All the same, she acknowledged, “all this takes time, because these are structural changes and the habits are ingrained in society”, so what’s needed is to “force the political authorities to bring in new rules and laws”. ♦

Leonor argues that people need to be educated about environmental issues, so that they can make conscious decisions.



## “We still have time”

Catarina Torres and Manuel Ruiz

**W**e spoke to two young people who started very early to care about the environment. Catarina Torres and Manuel Ruiz, both 17 years of age, make a point of embracing sustainability and “doing at least the minimum” because, if everyone joined in, “everything would be different”. Concerned, but optimistic, they believe that “we still have time”.

Watching a documentary entitled “Cowspiracy” in their 8th grade science class was a key moment in “raising awareness”. Starting from there, Catarina, now in her final year at the Cascais Drama School, started to read up on the subject and soon realised that “the cattle farming industry does some of the worst damage to the environment: it uses a lot of water, occupies a lot of land and the methane emitted by cows does some of the severest damage to the ozone layer”. So she stopped eating meat.

She also made other lifestyle changes for the sake of the environment. “I only buy second-hand clothes, the make-up I use is vegan and I’ve cut right down on plastic”, she told us. It’s a cause to which she tries every day to convert her friends and acquaintances “I talk about it a lot”, she said, convinced that “more and more young people are doing things for the environment”.

She admits that “one person alone can’t do anything”, but, as she points out, “if we all did the minimum, which is what I do, then everything would be different”. Aware that “the situation is critical”, she believes even so that “we still have time”: “I have hope for humanity”, she says. But she warns, “everyone needs to help, in particular governments and large companies, to take the right decisions, now”.

### At one with nature

Her friend and fellow student, Manuel Ruiz, from Santiago do Cacém, shares her concerns. It all started when he was around 12 years old, and “at school and by searching online, I learned much more about this problem we’re facing”, he told us. “From an early age I’ve recycled waste and I think about domestic water consumption”, he went on. He first volunteered to work on the Rota Vicentina hiking trail at the age of 13: “You pick up litter and protect ecosystems, helping people to be more aware and to enjoy being at one with nature”.



Catarina and Manuel have been concerned about the environment since childhood, and are proud that more and more young people are joining their cause.

At the same time, “I’ve been working on the ecological and human footprint of the things I buy”. This means “being aware of the where things come from and the impact they have on the planet, being sure that the brand I’m buying prioritises decent labour rights and environmentally sustainable work”. He’s also been cutting down on meat and avoids consumerism, especially products that can’t be reused. He helped to organise student climate protests, in September 2019, in Santiago do Cacém, because, he explained, “not staying silent is fundamental to raising awareness of environmental policy”.

Taking a stand was something that came naturally to him. “Helping the planet makes me feel good. Thinking that the long-term impact of what I’m doing is positive, is more than enough for me: when I die, I’ll be sure I’m leaving the world a little better than it was, and not the other way around”. ♦

# Forest and culture

When I think of forests, as well as thinking of the environment and health, I think of culture. Books are a good illustration of the relationship between forests and culture.



**T**he relationship between forests and culture has not always been recognised, but it's an undeniable reality. I'll start by thinking back to Carl Sagan, the American astrophysicist who did so much to bring science to ordinary people, who wrote, in the chapter "The Persistence of Memory" in his book *Cosmos*, originally published in 1982: "What an astonishing thing a book is. It's a flat object made from a tree with flexible parts on which are imprinted lots of funny dark squiggles. But one glance at it and you're inside the mind of another person, maybe somebody dead for thousands of years. Across the millennia, an author is speaking clearly and silently inside your head, directly to you. Writing is perhaps the greatest of human

inventions, binding together people who never knew each other, citizens of distant epochs. Books break the shackles of time. A book is proof that humans are capable of working magic."

And it is actually true: when I read *Cosmos*, I'm connecting to a physicist no longer alive, someone in my own line of work who is no longer active in the profession. But his message comes down intact to me.

When I think of trees, I think of the possibility of them coming back in books and in the prodigious ability that books have to connect individuals from across history.

Of course, one tree yields more than one book.

Using the orders of magnitude so beloved of physicists, they each correspond to around a hundred books. Ten trees make a print run of a thousand copies and a thousand trees a print run of ten thousand copies: a best-seller in Portugal nowadays.

It might be though that books - and paper in general, because there are also magazines and newspapers, not to mention the notebooks where we like to scribble - are the enemies of forests and nature. Nothing could be farther from the truth: in the first place, paper is not made from nature's wild forests, but from trees planted precisely for this purpose. The average time for a tree to grow into a book is between ten and twenty years, and the plantations are permanently renewed. They are harvested and then new trees are planted. What is more, the figures I indicated are overstated, as they fail to account for the virtues of recycling, which for paper can happen around half a dozen times. Recycling, which obviously has costs, is more feasible for magazines, newspapers and other uses than for books, which generally have readers who keep them.

Some people of course believe that e-books will render paper books redundant, with ecological advantages. Despite the rapid uptake of e-books when they first reached the market, this has trailed off in recent years: the Amazon Kindle, launched in 2007, promised a revolution, but ten years later the early promise failed to materialise: e-books account for only 20 per cent of sales, and the vast majority of books are still on paper.

Young people constantly use mobile phones not just to make calls but also for social media and games, but not to read books. Those that they read, such as the works of J.K. Rowling and John Green, they still read on paper. I am convinced that this format will never be superseded, as a book is an object with an emotional appeal, thanks to its perfect design for the function it performs. It has yet to be seen whether the renewal of electronic devices will allow e-books to survive as long as books on paper (several centuries!) and also whether the need to replace electrical and electronic materials will not cause environmental problems.

Portugal has an impressive area of woodlands, with problems which are well known. These range from the threat posed by fires, potentially fanned by climate change, to the difficulties of managing a mosaic of tiny holdings belonging to countless private landowners, many of them failing in their duty to care for them. Production forests, only some of which are for paper manufacture, have had a bad press in this country, because many people, mostly living in our cities, are unfamiliar with

the reality of woodlands, and also because some people fail to understand the close relationship between trees, paper, books and culture in general.

Cultivating forests is therefore a way of supporting our culture. The word "culture", from the Latin "cultura", has to do with "tend", "care", "nurture". Originally, the concept applied to tending plants: farming. But then it was transferred to caring for people: developing intellectual capabilities in human beings from a tender age. It seems clear to me not only that the two applications of the concept are compatible (they of course share the same origin), but also that they are much closer than commonly thought. There is no culture without books, no books without paper, and no paper without trees. Culture and silviculture can go hand in hand, and of course silviculture has to be sustainable. The key will be to plant and nurture.

On the subject of planting trees, it is curious to note that one of the pioneering works in Portugal was written by the Brazilian author, José Bonifácio de Andrada e Silva: "Treatise on the necessity and usefulness of planting new woodlands, particularly pinewoods in seaside areas; respective methods for sowing, finance and management" (Tipografia da Academia Real das Ciências de Lisboa, 1815). The author, who was a professor at the University of Coimbra, speaks several times in the book of the "economy of Nature", which is the meaning of "ecology", a neologism introduced 51 years later by the German naturalist, Ernst Haeckel. Haeckel probably never imagined that the word he coined would be so widely used.

If I know these things, it is because they are in books. I will now return to Carl Sagan who, in a subsequent passage of the same chapter of *Cosmos*, wrote: "Books permit us to voyage through time, to tap the wisdom of our ancestors. The library connects us with the insights and knowledge, painfully extracted from Nature, of the greatest minds that ever were, with the best teachers, drawn from the entire planet and from all of our history, to instruct us without tiring, and to inspire us to make our own contribution to the collective knowledge of the human species. Public libraries depend on voluntary contributions. I think the health of our civilization, the depth of our awareness about the underpinnings of our culture and our concern for the future can all be tested by how well we support our libraries."

I could not express better what Sagan wrote down on paper and was then inscribed once more on paper by giant rotating machines, to stay on the shelves of libraries, until it reached us and the centuries to come. ♦



Carlos Fiolhais was born in Lisbon in 1956. He graduated in physics from the University of Coimbra (1978) and completed his PhD in Theoretical Physics at the Goethe University, Frankfurt am Main (1982). He is Professor of Physics (retired) at the University of Coimbra. He has been a guest lecturer at universities in Brazil and the United States. He has written more than 60 textbooks and works of popular science, as well as several hundred scientific, educational and popular science articles

He is the most widely cited Portuguese scientist. Awards: José Mariano Gago, SPA (2018), Ciência Viva-Montepio (2017), Globo de Ouro de Mérito e Excelência em Ciência, SIC (2005), Ordem do Infante D. Henrique (2005), Inovação do Fórum III Milénio (2006) and Rómulo de Carvalho, Universidade de Évora (2006). He was Director of the General Library, University of Coimbra, and Coordinator for the Knowledge sector at the Francisco Manuel dos Santos Foundation. He is director of the Rómulo Living Science Centre at the University of Coimbra and edits the "Ciência Aberta" collection for Gradiva.

# Messages with life

You can make your own seed paper, to send cards or invitations, and then all you need to do is add earth and water for flowers, herbs or even vegetables to grow.



This technique allows you to recycle paper and "return" it to nature.

## Equipment

1 frame with cloth or nylon net (an embroidery hoop, if you have one, works perfectly)

1 liquidiser or hand blender

1 tray with raised edges, large enough for the frame to stand on it

1 large bowl

1 spoon

1 old towel

pair of scissors

## Material

Shredded paper, non-glossy

1 packet of seeds (your choice)

Warm water

Natural food dye (optional)

## 1 - Cut up the paper

Take the paper you're going to recycle and tear it into small pieces, or cut it up with scissors (the pieces should be no more than about a centimetre and a half across). Any paper will do, except paper with a glossy finish.

## 2 - Soak

Fill a bowl with warm water, add the torn-up paper and leave it to soak overnight.

## 3 - Liquidise

In the blender (or in the bowl itself, if you use a hand blender), add a little more water, if necessary and mix until it forms a thick paste.

## 4 - Add colour

If you want coloured paper, add a few drops of natural food colouring and mix it again, to spread the colour evenly. (For red-tinted

paper, you could boil some beetroot and mix cooking water into the pulp).

## 5 - Spread out the pulp

You need a uniform layer of pulp on the cloth or nylon netting. Place the frame so that it stands on the raised edges of the tray, so that the excess liquid drains on to the tray. Pour the paper pulp onto the cloth (if it's very thick or dry, add a little water, to "loosen" it, before you do this). Check that the cloth is evenly covered - you can use a spoon to spread the pulp.

## 6 - Place the frame on the towel.

Lay out the old towel on a flat surface. Place the frame with the pulp on top, so that the damp is absorbed by the towel.

## 7 - Add the seeds

Scatter the seeds you've chosen on the pulp, without covering them completely. Press down

gently, so that they don't fall off when the paper dries. You can scatter them randomly or, if you feel inspired, draw a shape with the seeds.

## 8 - Let it dry

Lift the frame and turn it over, with the pulp facing down, but not touching the towel. Let the paper pulp fall gently from the frame on to the towel - don't force it or try to peel it off, so that it doesn't tear. Let the paper dry on the towel, for at least 24 hours. If you're making just one sheet, you can let it dry on the frame.

## 9 - Use your imagination!

Check that the paper is completely dry. If it's curled up at the edges, put a weight on it (some books, for example), to smooth it down. Then, use it for whatever you like: biodegradable Christmas decorations for your tree, ecological confetti, labels, visiting cards, postcards, letters... Write on the side without the seeds, preferably with a non-toxic ink. ♦

**How do you plant the seed paper? Nothing could be easier. If you have a large sheet, tear it up into smaller pieces. Then just take one of the pieces and put it directly into a garden bed or container, covering it with soil and a little water.**

## Pots you can plant

You can make seed paper, as we showed on previous pages, but you can also use paper to plant seeds. When we need to germinate our plants, the blue recycling bin is an excellent place to start.

**V**egetables, herbs, root vegetables, ornamental plants... If they grow from a seed, you can germinate them at home, until the time comes to plant them out. And instead of the traditional plastic trays we find at garden centres, we can give a new lease of life to the paper we set aside for recycling. Nothing better than a naturally sourced, biodegradable material to be used to plant seeds. When it comes to planting out, instead of having to move a small and vulnerable plant to a larger pot or a garden bed, we can simply put our tiny vase into the soil.

### Tubes of toilet paper or kitchen roll

The cardboard tubes in the centre of toilet paper or kitchen rolls can be cut up to form small vases for baby plants or cuttings. The easiest way is simply to cut the length you need, leave the bottom open and stand the tubes close together, put in some soil and the seeds. Another way is to make several vertical cuts in the bottom of the tubes, and then fold the resulting flaps to form the bottom of the vases – this takes a bit more time and patience, but ensures that the earth won't slip out when you lift them up.

### Newspaper pots

Just roll and fold a few sheets of newspaper around a small jar or glass (serving as a mould) and secure the bottom using a little 'glue' made from flour and water. Or fold the paper around

a square contained, gluing the ends (or without glue, if you are good at origami).

### Egg boxes

Cardboard egg boxes have the advantage of already offering the right format, and can be used as they are for half a dozen or a dozen plants. Then all you need to do is cut them up, to separate them, and plant each one out in the garden.

### Trays for the little pots

You'll need a tray to keep the soil and water off the work surface or windowsill where you will leave the seeds or cuttings to grow, and more importantly, to stop it falling on the floor. As we're looking to reuse paper, this is another opportunity to use this versatile material. If you're in the habit, for example, of buying large numbers of tins (if you have a pet, you'll know what we mean!), you'll know they often come in small cardboard pallets, which you can save for this purpose. If not, ask at your local store – grocers' stores or small supermarkets often keep this type of packaging in a corner, with the smaller boxes, for people to take the shopping home. In these cases, you'll need to reinforce them with more cardboard, or sheets of newspaper, so that they keep in the damp. If you can get hold of really thick cardboard boxes, like those used to transport bananas, you can cut them up into trays, using both the bottoms and the lids. These are thick enough to withstand frequent watering without disintegrating. ♦

**When we use paper to germinate seeds, we can plant them out by placing the tiny pot or tube directly in the soil.**





# Re-imagining paper

Natural, recyclable and biodegradable, paper is a versatile and environmentally friendly material, offering a whole world of artistic possibilities. Just take the sheets and add your imagination and inspiration to make sculptures out of books, models of marine creatures, collages, flowers, animals... whatever you like. Here are a few examples.

## Miniature origami

Rhinoceroses, dragonflies, doves, raccoons, butterflies, pandas, dolphins, unicorns, flowers and bicycles, all modelled by the hands of Ross Symons. The South African artist has specialised in origami miniatures. With more than 100 thousand Instagram followers, he has breathed new life into the ancient Japanese art of making models by folding paper.

His first origami piece was a crane, in 2002. Today, he can make the same crane in less than 30 seconds, with his eyes closed, but some of his other designs can take up to two hours. He discovered this art form almost by accident, but ended up leaving the world of advertising to devote himself full time to the art of folding paper. "I began to like it so much that I decided to make it into a career and share my love of origami", he says. A career that has blossomed into exhibitions, installations, stop motion animation and commissions.

## Stories that come to life

It all started when Jodi Harvey fell under the spell of a box of old books. Since then, her favourite characters started to grow out of the books in 3D paper sculptures, taking pop-up art to a new level. There's a bit of everything. Human characters, marine creatures, giant ships, aircraft, hot air balloons and landscapes all depict scenes from books and capture the atmosphere of imaginary worlds.

"The books we love should come to life", explains the artist, who lives in Pennsylvania and has found her own way of combining her twin passions: art and literature. A combination that brings to life the things we so often imagine when reading the pages.

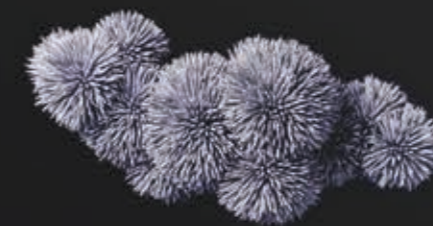
Jodi Harvey's artworks, created by hand and protected by a finish to make them more durable, have gone on show in galleries, and she even has fans who commission personalised pieces.

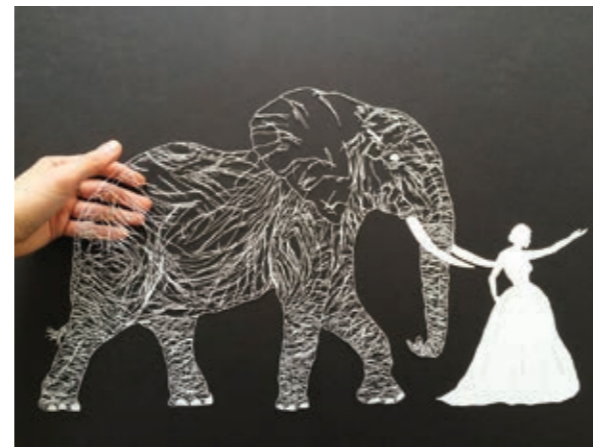
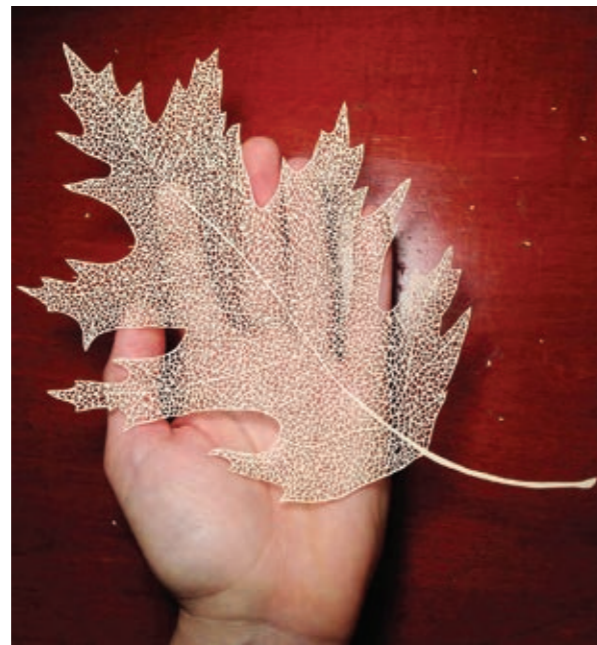


On this page, artworks by ©Ross Symons.

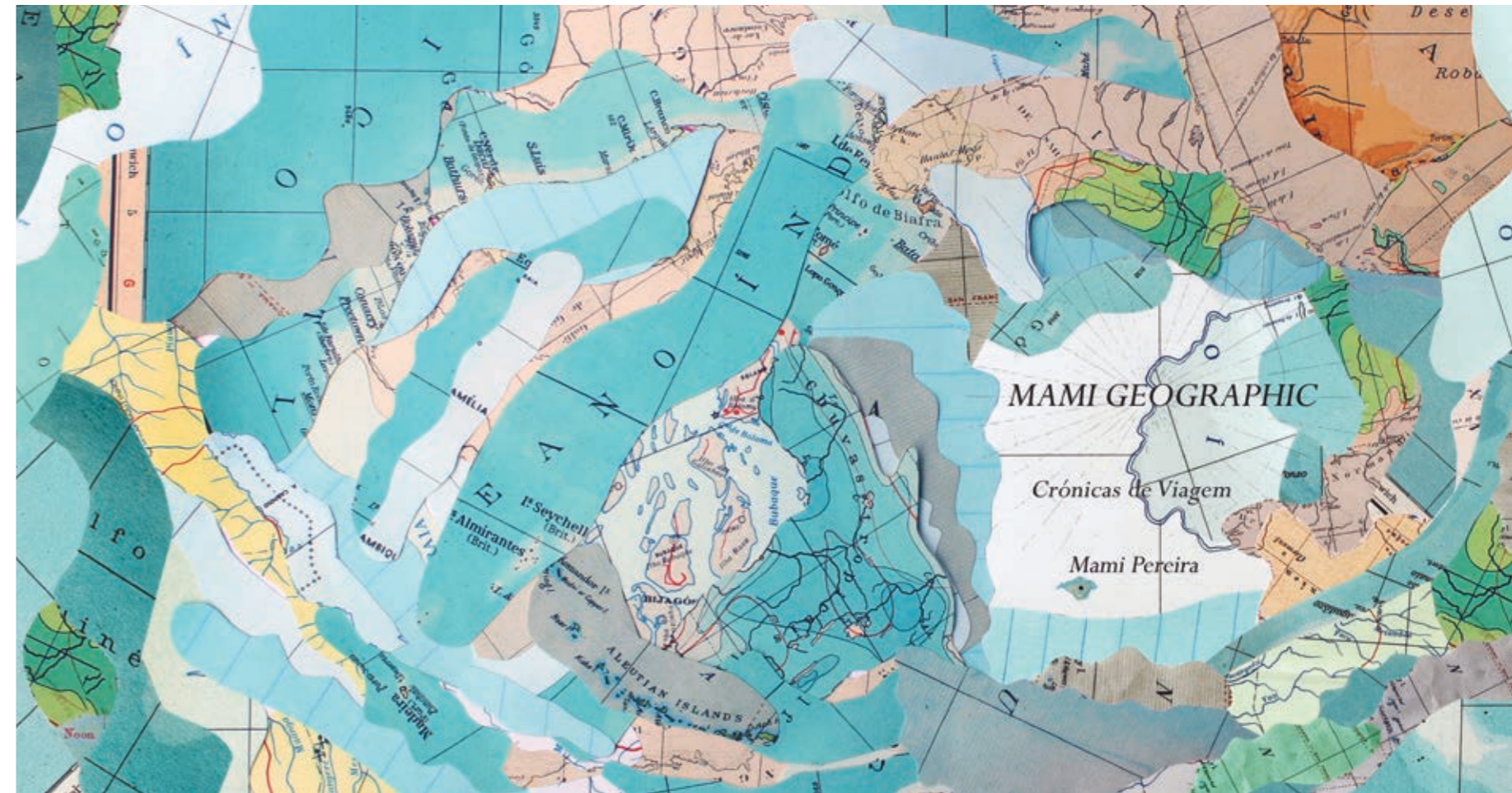


Above, pieces by ©Jodi Harvey. Below, pieces by ©Valérie Buess.





On this page,  
artworks by  
©Maude White.



### The mysteries of the sea

Sea anemones, coral reefs, shells, seaweed and marine figures emerge from the books recycled by the skilful hands of Valérie Buess, conjuring up the deep sea and taking it to a new dimension - paper sculptures that are at once abstract and figurative, embodying objects from a mysterious underwater world.

Born in Switzerland and based in Germany, the artist started to experiment with paper twenty years ago. By twisting, turning, rolling, tearing, folding and (carefully) adding colour to paper, the works emerge at the surface- Her work has been exhibited all over Europe and the United States, and today features a vast range of marine creatures, always in new and surprising forms.

### Collage with feeling

Using cuttings from old magazines and newspapers, along with scraps of paper, cardboard, three dimensional objects and photos, the illustrator Margarida Girão tells stories... and weaves magic. Decorative pieces, illustrations, paintings, portraits and other artworks emerge from the imagination of this designer who like to assemble "unlikely elements".

It was in Sertã, where she was born, that she started to make collages from magazines for her own entertainment, when just 11 or 12 years

old. Today, she makes exclusive pieces that she sells online. Her work includes illustrations for books and CDs, wallpaper and portraits. She puts together each piece by exploring the theme and drawing on her inspiration, images and emotions. Self-critical and a confident learner, she today combines paper with computer art, in a constant search for new and innovative forms of communication.

### The art of cutting

She creates objects and tells stories by cutting paper, with precision and delicacy. Maude White is a respected (and award winning) artists and craftswoman, who loves to demonstrate the vast world of opportunities offered by paper, a material for which she has a huge respect. What she wants most of all, she confesses, is for her art to "communicate what she is unable to express in words".

Maude White, who lives in the Hudson valley, was raised in a family of storytellers and grew up surrounded by theatre and books, an atmosphere that was to shape her special skill in cutting paper. She believes that something ancient and sacred lies behind her art "When I cut up paper, I feel as if I'm peeling off the superficial outer layer of our vision, to reveal the secret space below". She believes that "art can cure" and hopes her work can spread love and kindness.

### Magical drawings

Simon Schubert studied fine art at the Kunstakademie, in Düsseldorf. At first sight, his images, full of detail, appear to be drawn in pencil. We need to look closely at them to realise that there is no material there apart from paper, and no tool has been used except his hands: the tiny, perfectly formed scenes are 'just' folds in a sheet of paper.

His works are images in a neutral state, in a uniform non-light. They depend entirely on the light of the room where they are displayed, and that makes them unique to each glance, as they appropriate the temperature and intensity of the light. They present a play of shadows, nuances and reflections in the paper folds that become almost photographic.

The light cast by the room at the moment of display, that reveals or conceals certain aspects of the landscape, architecture or faces, confers a mysterious atmosphere on Schubert's work. In some of his creations, the rooms of houses are inhabited by hidden human figures, whose shadows seem to move in and out of the scene, in the interaction of shadow and light, shifting between two and three dimensions.

All thanks to the magic of paper, where the lines, angles and circles are elevated to set inward and outward folds against each other, conferring on a simple white sheet an aesthetic and artistic quality that is entirely out of the ordinary. ♦

Above, an artwork by  
©Margarida Girão. Below,  
artworks by ©Simon  
Schubert.



## Awards for The Navigator Company

### Society of Engineers Trophy



Adriano Silveira, of The Navigator Company (left) and Aires Ferreira, President of the National College of Mechanical Engineering of the Society of Engineers (right).

The Navigator Company was awarded the Society of Engineers Trophy, as part of the celebrations for the 85th anniversary of the founding of this Portuguese institution. The company was selected for the award by the College of Mechanical Engineering, because of its positive impact on the Portuguese economy, on exports and gross value added (GVA), and its strong investment in decarbonisation. Special mention was made of Navigator's management processes and circular use of materials, and of its innovative projects in the area of digital transformation. We should recall that Navigator was the first company in Portugal, and one of the first in the world, to make a commitment to meeting the Portuguese and European targets 15 years early, by achieving carbon neutrality at its industrial facilities by 2035, involving an 86% reduction in its CO<sub>2</sub> emissions. ♦



The Naturally Soft tissue range is produced without using chemical bleaching agents.

### Navigator Tissue Ródão is one of the "500 Biggest & Best Companies" in Portugal

Exame magazine has named Navigator Tissue Ródão, the company operating The Navigator Company's tissue plant in Vila Velha de Ródão, in the "Basic Materials" category, as one of the Portuguese companies that recorded the most business growth in 2020. Operating since 2015, this plant marked the Navigator Group's move into the tissue segment (hygiene-sanitary paper). The factor uses cutting edge technology and has pioneered new levels of efficiency in Europe: connected by pipeline to the pulp mill, it contributes to a reduction in environmental impacts whilst scoring gains for the economy and high standards of effectiveness. In 2020, the plant in Vila Velha de Ródão reused 98% of all waste, which is burned for energy, composted or incorporated into products. In the same period (2020), The Navigator Company's tissue division recorded a sales volume of 106 thousand tons, up by 10% on the previous year. ♦

### Kitchen roll with built-in soap name "2022 Five Star" product



The Navigator Company's Aquactive range, a new generation of tissue paper featuring built-in soap, activated in contact with water, was named a 2022 Five Star product, in the Kitchen Roll category. Exemplifying Navigator's commitment to developing products with a real impact on people's quality of life, the Aquactive technology combines the cleaning properties of soap with the practical application of paper. Amoos Aquactive is made from virgin *Eucalyptus globulus* fibre and is dermatologically safe, as the soap with which it is impregnated is produced from sugars and oils from renewable natural sources, free of sulphates and from polyethylene oxide. The "Five Star" seal bears witness to the level of consumer satisfaction achieved by products, services and brands. This accolade was awarded after 1,188 "blind trials", in which users were not told what brand they were using, with Amoos Aquactive outperforming the other five brands assessed in the category. ♦

## Raising young people's awareness of the importance of woodlands

The "Forest of Wisdom" project sets out to raise awareness and educate children and young people about forests, sustainability and the forestry bioeconomy. This project is run by RAIZ, Navigator's forestry and paper research institute, with support from the Gulbenkian Foundation's Sustainable Development Programme. It is aligned with the United Nations sustainable development goals, as recently validated by the National UNESCO Commission and the UNESCO Club. The activities drawn on the scientific and technological expertise developed by RAIZ and on the natural woodlands heritage of the Quinta de São Francisco (in Eixo, near Aveiro), where several Forest of Wisdom events will be held. The laboratory installed in the former house of Jaime Magalhães Lima will be the venue for exhibitions and talks, with events also at the other RAIZ site, at the Espirra Estate in Pegões. The website at [www.florestadosaber.pt](http://www.florestadosaber.pt) offers online games, such as My Forest Kids, with characters developed for children aged 6 to 9, and full information on practical, field and laboratory activities, on the topics of woodlands and sustainable development. The activities are free of charge: all you need is a confirmed booking. Younger participants, with their families or school communities, can also get to know some of RAIZ's new products, helping them to understand the impact that the development of bioproducts and creating value from forests will have on their lives.



The activities are free of charge: all you need is to book in advance.

"These activities complement items relating to forests on school curricula, which are often limited to short theoretical references in textbooks", explained Carlos Pascoal Neto, general manager of RAIZ. RAIZ is a private, non-profit research centre, functioning as a joint venture between The Navigator Company, the University of Aveiro, the University of Coimbra and the Higher Institute of Agronomy of the University of Lisbon. It is accredited as part of the Portuguese Science and Technology System, and as an Interface Centre (Technology Promotion and Transfer Centre). ♦



The "near-threatened" species, *Cheirolophus uliginosus*.

### New species found in Serras do Porto Park

A small area of *Cheirolophus uliginosus*, a species that is endemic in the Iberian Peninsula and "near-threatened", according to the Portuguese Vascular Flora Red List, has been discovered for the first time in the Protected Landscape of the Serras do Porto Park. Characteristic of peat bogs and found along the banks of water courses and around the edges of woodlands and wetlands, from the coast at Vila do Conde round to south-west Spain, *Cheirolophus*

*uliginosus* was found for the first time in the National Network of Protected Areas in the district of Porto, in the course of the annual monitoring of wildlife in the holdings managed by The Navigator Company, carried out by Floradata - Biodiversidade, Ambiente e Recursos Naturais. In The Navigator Company's woodlands up and down the country, around 800 species and sub-species of flora have been identified and are protected, along with 241 species of fauna. ♦

## “Some see private enterprise as a predatory target to be shot, others as a cow to be milked, but few are those who see it as a sturdy horse pulling the wagon” Winston Churchill

**R**ecently, BCSD, of which Navigator is a member, organised a conference on Sustainability: challenges for the decade 20-30. The event addressed several times the various “Ps” that mark out the vision of companies travelling towards sustainability: People, Plant, Profit, Purpose, Partnership. The first three “Ps” were adopted in the nineties, as the definition of sustainability. The two latest “Ps” reflect a new business attitude, extending to the value chain: Purpose in society, beyond increasing value for shareholders, and Partners, as great challenges cannot be tackled individually in an interconnected world.

Industry has had a growing impact on the environment and on society, and corporate responsibility has also grown in importance. Many companies now make “zero” commitments, others include sustainability in their long-term strategies, many published sustainability reports, some have integrated sustainability into all their functions and into the CEO’s agenda, whilst innovation has become the driving force behind sustainable solutions and legislation requires businesses to adjust their goals. All this is clearly revealing of the determination of the business world to take a leading role in the transition to a more sustainable world. Obviously, this also requires a new way of thinking about business. But this is a journey that has to go further, and one we must take collectively.

The world is facing a systemic crisis in its climate, biodiversity, health and economy. It is clear that everyone needs to pull together in response to the changes engendered by these crises. And it is clear that legislation has an influence on this response. However, it is also clear that much of the response comes from companies, in particular in the industrial sector, who are realising that they need to change, transform themselves and offer solutions. It is industry that invests in cutting emissions, in energy efficiency, in production and more sustainable products, and in innovation. Above all, it is industry that face and manages the risk.

In the forestry-based sector, the concept of sustainability has been defended for many years in its long march to achieving recognition for its products as a key factor in mitigating climate change and managing natural resources on a lasting basis. But the successes of the past are no guarantee of a brilliant future. In an uncertain and changing world, the ability to adjust and change is now needed at every turn, and this will be how success is measured in future. This is a crucial moment for humanity. Navigator’s 2030 Agenda is a historic moment in the company’s life. Embracing the future, in keeping with wider, world-changing trends, adapting to new

opportunities and synergies, in order to creating value responsibly: this is the business model adopted by Navigator.

The trump card held by forest-based industries in the fight against climate change is its ability to unlock the value of renewable resources in substituting fossil raw materials, both for energy and for products. This is what Navigator does. By adopting the five “Ps” in its three strategic action areas - Nature, Climate and Society -, Navigator has mapped out its road into the future and moved from strategy to action, creating real movement. Investment in a new biomass boiler meaning switching to renewable energy for paper production. The launch of a new packaging paper range contributes to replacing plastics. The commitment to the bioeconomy leads to the use of cellulose fibre to substitute fossil-based materials. When optimised, the activity of the circular economy drives the green economy. Biodiversity remains a centrepiece of the 2030 Agenda. Sustainable forestry management allows CO<sub>2</sub> to be sequestered. We should recall that, in 2007, the United Nations Framework Convention for Climate Change Report was clear in stating that “sustainable management of forests, with the aim of maintaining or increasing carbon stocks, at the same time as producing wood, fibre or energy, with result in the greatest sustainable benefit for climate mitigation.”

The complexity and vulnerability of our interdependence with the natural world has been reflected in Navigator, a company with global reach, especially in recent years. The process of strengthening its practices and principles along the value chain will add to its forward momentum.

The advancement of nature and society that guides Navigator is sustained by the “Human Fibre” of its workforce. It is the talent, dedication and skill of our people that generate the resilience needed to succeed in the “new normal” in which we now live. ♦

**Teresa Presas**  
Member of the  
Board of Directors of  
The Navigator Company



## The Circular Bioeconomy is no longer a mirage

**W**hen a crisis hits, what is needed is objectivity and, above all, clear-sightedness. So let us be clear and use some of the metrics at our disposal: the circular bioeconomy currently accounts for only 8.6% of the world’s economy<sup>1</sup>. This in itself would be a significant gap in relation to the aims of mitigating climate change - estimates<sup>1</sup> suggest that the circular component in the economy has to be at least 17% in order to turn around global temperature rises -, but the situation becomes more urgent when we recall that the quantity of natural resources consumed by mankind is more than 100 billion tons each year<sup>1</sup>, of which 75% are from fossil sources<sup>2</sup>. What is more: around 90 billion tons<sup>1</sup> of these resources are used on a linear (and not circular) basis, meaning they are discarded after use.

The risks are clear and easily measurable. However, as in all crises, we have to look for the opportunities and, above all, believe that we have what is needed to overcome the obstacles.

The circular bioeconomy is fundamental in responding to our collective mission to respond to the great challenges of our time, such as climate change, the scarcity of resources, lost and wasting of food resources, changing land use and loss of biodiversity. The underlying concept, which is the use of biological resources (rather than fossil resources) for produce food of human and animal consumption, products and energy, combines with the idea that these resources are renewable, have been managed sustainably and reclaimed for further use.

This opportunity is clearly presented in Portugal, as shown by a report<sup>3</sup> issued by BIC (Bio-based Industries Consortium) in March 2021, which considers that the country is excellently placed to lead the transition to a bioeconomy in Europe, and identifies the “food and drink”, “pulp and paper” and “wood processing” industries as three sectors able to drive the bioeconomy. To be this catalyst for the European economy, the report points to what Portugal needs to succeed, including the extent and economic importance of its forests.

Portugal is one of the European countries with the largest proportion of woodlands, 36% of its territory, making this the main form of land use. For this reason also, Portugal’s forests are crucial for earning the country a key competitive position in the process of transformation towards the economy of the future. This transformation will moreover be fundamental in order for Portugal to contribute to the Sustainable Development Goals and to comply with the targets of the European Green Deal.

As a forest-based venture, The Navigator Company is well aware of this reality and is already committed to the bioeconomy road on the basis of innovation. The new generation of packaging products is an example of this: Navigator has launched a range of packaging

papers produced from *Eucalyptus globulus*, called gKraft, offering an alternative to long fibre from northern Europe, which is less efficient in terms of yield, and in replacing the use of plastic packaging. In tissue, a business area into which Navigator has successfully diversified, its efforts to develop new products has also been responsible for introducing truly disruptive solutions, making it more competitive and enriching the company’s portfolio.

In both tissue and packaging, this is the result of Navigator’s commitment to searching for new sustainable solutions firmly anchored in R&D, maximising its capital of expertise and harnessing the best available technologies.

On the basis of this value chain, Navigator has invested in responsible forestry management, governed by good silviculture practices, managing and conciliating the interests of sustainable production of wood and other forestry products, with the functions of conservation, leisure, carbon sequestration, combating erosion, regulating the water cycle, ensuring based products and many others.


The opportunities are there to be taken. But there is only one road to follow.

In the context of the developing circular bioeconomy, Portugal needs to seize the opportunities offered by forests, in order to produce more and better products, with incentives to good forestry management practices. Throughout this circular economy, the contribution to decarbonisation of the economy also involves facilitating support for R&D, technology transfer and innovation projects that support efforts to cut emissions along value chains. “Bio-based circularity” is much more than a mirage. Around the world, it represents an opportunity worth USD 7.7 billion<sup>4</sup> and cuts across all sectors. And it is no longer just a fantasy, because we have finally reached a level of scientific and technological expertise that makes it feasible, in a way previously impossible, to create new generations of bio-based products that can effectively substitute those derived from fossil sources. ♦

**Nuno Santos**  
Member of the  
Executive Board of  
The Navigator Company



<sup>1</sup> - Circularity Gap Report, 2021. <sup>2</sup> - Circularity Gap Report/WBCSD. <sup>3</sup> - “Mapping Portugal’s bio-based potential”, 2021. <sup>4</sup> - Boston Consulting Group/WBCSD: Estimated potential of the circular bioeconomy for products, energy and human and animal food waste in 2030, excluding food for human and animal consumption consumed.



**Forest is the principal  
form of land use in  
Portugal, accounting  
for 36% of its territory.**

**34%**

*Montado*, cork oak  
and holm oak

**30%**

Pine woods

**26%**

Eucalyptus forest

**10%**

Other deciduous trees  
(oak, chestnut, etc.)

Source: 6th National Forest Inventory, ICNE, 2019