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INTERVIEW

The importance of digitization in production processes

FOREST

The sustainable future of modern society

CIRCULAR ECONOMY

A CYCLE OF THE FUTURE

summary

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THE CIRCULAR ECONOMY
ISN'T JUST A BUZZWORD, AT ALTRI IT'S A REALITY

CARLOS VAN ZELLER E SILVA, CEO | Operations at Altri

Society in general, and the economy in particular, are very cyclical. Every cycle is given a name some time after it has started, and these names often become nothing more than jargon.

Two of the biggest buzzwords right now are Sustainability and Circularity (or circular economy), which are very much intertwined. Because of what they represent, they are now at the top of the agenda. The former, under the name Sustainable Development, gained worldwide attention following the report by Gro Brundtland ("our common future", 1987), which disseminated an idea formed in the 70s, and which can be seen as an umbrella term for a balanced economy, based on 3 pillars: economic; social; environmental.

The latter, which dates back to the same period but which has only recently come into the limelight, is based on three principles: reducing waste; (re)circulating products and materials; regenerating nature.

Terms such as Reduce, Recirculate, Recycle and Reuse entered our common lexicon when society realised that our world and its resources are not infinite. This was helped along by impactful images shown on television, but especially on social media, forcing governments worldwide (and in particular the governments of more developed countries) to take measures to turn this situation around.

At Altri we keep abreast of these trends and are very aware of our social responsibility, and our investments have therefore always included the BAT (best available technology). This approach has enabled us to be at the forefront of what is now called the circular economy, with some innovative projects which are setting a global standard:

- Very low specific water consumption in our process;
- Recirculation of final effluent back to the water used in the process;
- Reuse of sawdust and rejected materials for pulp production.

THE FUTURE WILL NOW BE MORE COMPLEX, BECAUSE THE "EASY PART" HAS ALREADY BEEN DONE...

The growing importance financial bodies are placing on SDG Indicators, in which Altri has scored extremely highly, and the social and economic climate in which we live, have alerted society to the dangers of relying on dictatorial and unstable political and economic blocs.

These threats could become opportunities through innovation, industrial symbiosis and active cooperation with other industrial sectors.

The efforts to find added value in waste or undervalued secondary net streams will become increasingly important in this new economic cycle.

Challenges, such as implementing an "aquarium" factory, where almost all final effluent is put back into circulation; a factory with no fossil fuels; the elimination of industrial landfills and recovery of CO_2 from chimneys, are all on the table. These challenges can be overcome – some easily some less so – and incorporated into the process with economic advantages, as has happened in the past.

FINAL OBSERVATION:

We have to mention an extraordinary opportunity, which involves finding a solution to a serious environmental, economic and social issue, which is textile recycling.

Unlike the metal, paper and glass industries, where recycling rates top 60% (in the developed world), the figures for the textile industry are negligible, less than 1%. This has its own inevitable consequences. But we will address this issue when (and if) the GAMA project goes ahead.

Revision of the Code of Ethics brings all Altri's values into line

Altri's Ethics Committee has revised the Code of Ethics in line with the values which are entrenched in its DNA. The revised version now better reflects Altri's position – more sophisticated and more international, with even greater focus on its culture of equality and diversity.
Integrity, Courage, Simplicity and Excellence are the Altri Group's values which were identified during the Code of Ethics revision process, and the intent is to "Build a more renewable world."

Phoenix Project promotes productive potential in areas devastated by wildfires

The Phoenix project provides free-of-charge support to forest owners in maintenance operations carried out in forest stands affected by fires, thereby promoting their recovery, increasing production and providing incentives so that these forest areas are not abandoned.
During this initial phase, the area earmarked to receive help is in the borough of Vila de Rei, where the aim is to lower the density (by thinning out stumps); eliminate invasive species; prune away dead twigs resulting from the fires; reduce the fire load within the forest stands, and also support the registration process (BUPi).
The project was recently announced at the Sausage, Cheese and Honey Fair in Vila de Rei, to the thousands of visitors present, including the Minister for Territorial Cohesion, Ana Abrunhosa.

Grants for forest engineering courses

The Altri Group, Corticeira Amorim, Sonae Arauco and The Navigator Company have formed a public-private partnership to fund 22 grants which will cover 100% of the tuition fees for courses relating to forest engineering. The courses will be taught at the University of Trás-os-Montes e Alto Douro and at the University of Porto (UTAD and UP), at the Instituto Superior de Agronomia (ISA) or at the Escola Superior Agrária de Coimbra (ESAC).

Altri's profits grow to 69.6 million euros in the first half of the year

Production volume, turnover and rising international market prices have resulted in Altri's total revenue - which includes income other than that from fibres - reaching 521.7 million euros in the first half of 2022, which represents a year-on-year growth of 41.8%.
The net result from the Altri Group's continuing operations stood at around 69.6 million euros in the first six months of 2022, up by 56.9% on the same period the previous year. The market environment is favourable in terms of cellulose fibre prices which was limited by the inflationary environment of various variable costs which was reflected in the margin performance.
The sales volume stood at around 589 thousand tons, a 1.1% drop on the first six months of last year, with external markets absorbing 504.8 tons, 86% of the total.

Summer Academy welcomed 42 youngsters at Altri

This year the Summer Academy, a initiative by Celbi, tried out something new by bringing together the Altri Group's three factories: Biotek, Caima and Celbi. The children of employees are given preference in attending the Summer Academy, until all the places are filled up. Over the course of around a month, attendees are given hands-on experience of some of the company's business activities, from factory jobs to corporate positions. This pre-professional experience enables them to develop personal skills, provides a useful way to spend the summer and is also rewarded with a grant.

Greenhouse gas emission reduction goals approved by the SBTi

The Science Based Targets initiative (SBTi) validated the goals stipulated by the Altri Group to reduce greenhouse gas (GHG) emissions. The commitment is to cut Scopes 1 and 2 GHG emissions by 51% per ton of cellulose fibres produced by 2030, starting from base year 2020, which translates as a 43% reduction of absolute emissions. With regard to Scope 3 GHG emissions, which account for 67.04% of the Altri Group's total emissions, the commitment is to reduce by 25% GHG emissions per ton of cellulose fibre produced by 2030, starting from base year 2020, meaning absolute emissions being lowered by 13%.

Post-graduate course in Economics and Industrial Management at ISCAC receives support from Altri

Altri has once again become a partner on another edition of the post-graduate course in Economics and Industrial Management, in an initiative by the Coimbra Business School (ISCAC) together with the Coimbra Engineering Academy (ISEC).
This post-graduate course seeks to provide advanced and multidisciplinary training, endowing professionals with the necessary skills to streamline, manage and optimise resources, and ensure continuous improvement of organisational efficiency and performance, using the latest methods, techniques and industrial equipment.

“Your scene is our scene”

Under the slogan: “A tua praia é a nossa praia*”, the Altri Group made its first appearance at RFM SOMNII — The biggest sunset ever — at Figueira da Foz.
While both publicising the Altri brand and pushing its message of sustainability, the company used the opportunity to convey some of the goals of the 2030 Commitment to the young audience.
Thousands of festival-goers visited the relaxed and informal Group area, and were welcomed into the world of Altri, where they learnt what the Altri Group is, what it does and how it cares about People, the Planet and the Future.

*Your scene is our scene

Hybrid excavators cut Altri Florestal CO_2 emissions

Three next-generation machines will be joining Altri Florestal’s timber harvesting and ground preparation activities. According to the manufacturer Volvo, this new equipment can achieve a saving of 17% compared with the conventional version of the same machine. As well as this machinery, Altri will be adding other equipment with the same characteristics throughout the year.

Cotec grants Innovator status to Caima, Celbi and Biotek

Caima, Celbi and Biotek have granted COTEC INOVADORA Status for 2022. This title is awarded annually in recognition of companies which combine high standards of financial stability, operational efficiency and technological innovation potential to create robust, profitable and recurring growth.

LINA RAIMUNDO, Senior Waste Management Officer at Celbi

WASTE OR RAW MATERIALS?

Cellulose fibre factories are an excellent example of the circular economy and sustainability concept. What would cellulose fibre production be without chemical and energy recovery? What about the discarded raw materials and energy, and high waste generation rate? Would it be sustainable? Of course not!

Os Waste materials play second fiddle in any organisation. They are considered as being worthless, something to be thrown away. Indeed, the law defines waste material as any substance or object which the owner either intends to or is duty-bound to discard. In other words, any substance or object which is no longer useful and becomes regarded as waste and whose management is automatically governed by specific provisions. In most cases, there are costs associated with waste management and in companies such as Altri, such costs are not insignificant. Hence the need to take a different approach to waste.

A project was implemented at Celbi, aimed at building up the Group's capacity to produce cellulose fibres incorporating residual fibre sources – such as fine fibre materials and rejects from the cellulose fibre manufacturing process – thereby contributing towards reducing reliance on external timber and lowering the Group's timber costs. The innovative aspect lies in the simplicity of the concept and the associated technology, which were combined to produce a prototype of a digestor which is the only one of its type in the world. This project works on reducing the amount of waste generated and promotes the circular economy.

Paper and cardboard, tyres, scrap metal, Waste Electrical and Electronic Equipment (WEEEs) and used oils are just some of the items which the organisation has long been recycling.

The activated sludge from the IWWTP (Industrial Waste Water Treatment Plant) is currently sent to management facilities where, together with ash from the biomass-fuelled thermoelectric boilers, it is converted into compost which is used as fertiliser to enrich the soil with organic material which is so vital and so scarce. Next year, as part of a partnership with Agristarbio, we are expecting to produce an organo-mineral fertiliser using sludge from the IWWTPs, which will replace synthetic chemical fertilisers used in the forests cared for by Altri florestal. The activated sludge is also used as a raw material in the expanded clay production process, and as fuel to produce energy, in the recovery boiler and the biomass thermoelectric boiler.

Carbonate mud – another waste material generated at the Altri Group – is not discarded but rather re-used as a raw material for the cement industry and is soon to be used as raw material for ceramic pastes.

Fluidised bed sand is used to produce mortar, concrete products for construction and in landscape restoration.

We must regard waste as another flow which can and should be valued, because in fact almost all waste can be useful in terms of circularity when incorporated into new products.

But that's not all. The ALTRI Group has been investing in sustainable and renewable solutions throughout its business activity. This ambition was widely reflected in the launch of our 2030 Commitment (available at https://altri.pt/pt/sustentabilidade/o-nosso-compromisso). This document sets out the goals we are striving to achieve by 2030, in multiple areas, focusing particularly on seven Sustainable Development Goals (SDG). There are 12 goals which point the way to our future, the highlight being the aim to make good use of 100% of our waste.

We are forging ahead on several different fronts to achieve this goal.

Under the aegis of Kobetsu 'Return to origins', possible applications of waste generated in our industrial facilities were identified, with a view to using this waste to improve soil quality, particularly in eucalyptus plantations which provide our main raw material. The goal is to take those elements that were removed from the forest (in timber and biomass) and which are still contained in the leftover material once the process is complete, and to return them to the forest. We are currently analysing the possibility of using lime sludge and ash from the biomass boiler as a soil alkaliser and using fluidised bed sand to fill in potholes in forest pathways.

We are establishing a partnership with the University of Aveiro to study potential applications for waste in different areas relating to construction. We are in the final stage of selecting potential partners for this waste.

These are just some examples of waste recovery that have been implemented at Altri, or which are in development. Now when people ask: Waste or raw material? The answer is emphatically: Raw material!

The activated sludge from the IWWTP is currently sent to management facilities where, together with ash from the biomass-fuelled thermoelectric boilers, it is converted into compost which is used as fertiliser to enrich the soil with organic material which is so vital and so scarce.

WHAT DOES ALTRI DO IN THE CIRCULAR

Miguel Silva, Chief Financial Officer at Altri, addresses how the subject of the circular economy fits into the Paper and Pulp business, which has long been making use of various different by-products generated during the manufacturing process, and explains how Altri continues to seek applications for most of the waste produced.

ECONOMY?

MIGUEL SILVA, CFO at Altri

Circular Economy (CE) is an expression we are increasingly hearing in our day-to-day lives. But what is the Circular Economy and when did it come about? The concept emerged from the management of industrial and urban waste of the 80s. The term Circular Economy was coined by Stahel (1976) and expanded upon by Pearce and Turner (1990), with Germany being the first country to introduce legislation in the field in 1994.

First came the concept of the 3Rs (Reduce, Reuse, Recycle), followed by cradle to grave which basically meant thinking ahead during the production planning stage about the waste generated throughout the process, in order to avoid the use of toxic materials. This finally evolved into the cradle to cradle concept, where waste is regarded as a starting point for a new product or type of use, and which generically fulfils the Circular Economy concept. This new approach differs from the traditional Take-Make-Dispose model. By reusing and recycling as much as possible, repositioning and selling products beyond their initial lifetime, the Circular Economy generates economic activity and creates employment, while simultaneously reducing environmental pressure.

The Report titled Growth within a circular economy vision for a competitive Europe concludes that the Circular Economy may generate better results in terms of wellbeing, GDP and job creation than the "traditional" approach. Miguel Silva, Chief Financial Officer da Altri

MAKING USE OF BY-PRODUCTS FROM THE MANUFACTURING PROCESS

The Paper and Pulp sector, and the Altri Group in particular, have long been making use of various by-products from the manufacturing process. Possibly the oldest example is black liquor which is burnt to produce energy subsequently used in the process, or the surplus sold to the grid. Other examples of the Circular Economy at Altri include selling lignosulphonates to the construction industry, making use of lime sludge in the cement industry's kilns and using fine materials in a digestor created specifically for that purpose (this project is the first of its kind in the world).

Altri also has other Circular Economy projects at various stages of implementation, such as using Acetic Acid and Furfural at Caima or - in partnership with Agristarbio - making fertiliser using secondary sludge resulting from treating effluent from Biotek and Caima. Acetic Acid is a raw material for the chemical production chain while Furfural is a base chemical with multiple uses. Furthermore, some of the fertilisers produced using secondary sludge will be used once again within the Altri Group, to fertilise the forests cared for by Altri Florestal.

Altri has several projects of circular economy as the valuation of acid Acetic and Furfural in Caima or, in partneship with Agristarbio, the trnasformation in sludge fertilizers secondary from the effluent treatment from Biotek and Caima.

Promotion of circular economy

Altri is fully committed to promoting the Circular Economy, by reusing all its by-products and striving to enhance all its waste products by bolstering their economic value, to help create a more sustainable planet.

FINDING APPLICATIONS FOR THE WASTE PRODUCED

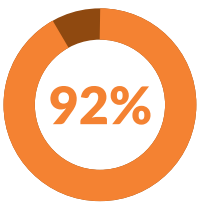
In addition to the projects currently underway, the company also aims to discover applications for most of the waste produced such as dregs, grits, carbonate mud, ash from the lime kiln and biomass thermoelectric boilers, sand and slag from the biomass thermoelectric boilers.

If implemented, Altri's project in Galicia will go a long way towards helping one of the world's most polluting sectors: textile and clothing. Producing textiles using sustainable cellulose fibres (with the expectation of being able to incorporate recycled textiles in the future) will be one of the main ways of improving sustainability in a sector which uses up around 65 billion tons of raw materials annually, 80% of which becomes waste!

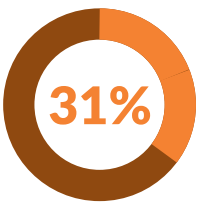
It's therefore clear to see that Altri is fully committed to promoting the Circular Economy, by reusing all its by-products and striving to enhance all its waste products by bolstering their economic value, to help create a more sustainable planet.

THE POTENTIAL OF THE CIRCULAR ECONOMY

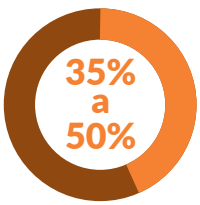
But what's the real potential, in global terms, of this new environmental and economic approach? A report titled "Growth within a circular economy vision for a competitive Europe" was published in 2015, and the conclusions are



In Europe, a car spends on average 92% of its time stationary



31% of food is wasted throughout the chai



An office in Europe is used for only 35 to 50% of its available time

surprising. As well as the environmental and social benefits, the economic benefit in Europe could top 1.8 trillion euros by 2030. The report concludes that the Circular Economy may generate better results in terms of wellbeing, GDP and job creation than the "traditional" approach. The examples of opportunities which were identified are many and diverse, and perfectly illustrate their potential:

– In Europe, a car spends on average 92% of its time stationary;

– 31% of food is wasted throughout the chain;

– An office in Europe is used for only 35 to 50% of its available time.

By sharing cars and employing self-driving solutions, the average cost of vehicle use could fall by up to 75%. Industrial or modular processes may bring construction costs down by up to 50% and houses designed to convert solar energy could reduce energy consumption by up to 90%.

NEW BUSINESS MODELS

Nevertheless, switching over to a society which starts to value extending the life of products and equipment, means that business models must undergo a profound transformation. With equipment, for example, the sales relationship will very likely become a service where there is an incentive to extend the lifetime of the item. Some manufacturers already even offer a disassembly and recycling service. One example is ABB, together with its associate company Stena Recycling, where products are reconditioned and can be used to manufacture new engines or are resold to other customers.

There are probably as many challenges in the way as there are advantages, but it is vital that each and every one of us, companies and private individuals alike, does our bit so we can all live in a world where products have increasingly long lifecycles, and where waste is transformed into raw materials or other products or businesses, thereby contributing towards a more efficient and sustainable planet.

GUALTER VASCO, the head of Digital Transformation and Asset Management at Altri

"WE'RE HERE TO RESOLVE THE ISSUES AND MEET THE CHALLENGES BROUGHT TO US BY OUR FACTORIES"

Gualter Vasco, who heads up Altri's Digital Transformation and Asset Management department, explains that this area of Altri seeks solutions and tools to meet the challenges presented by the organisation across all its business activities.

The term "Digital Transformation" is now commonly used within companies and refers to processes where digital tools are employed to resolve issues which, more often than not, have long been a daily part of business: production or performance shortfalls, issues relating to procedural efficiency or the streamlining of methods used. What's changed is the tools now available to companies and the way they are used across the multiple levels of operation. We spoke to Gualter Vasco, the head of Digital Transformation at Altri, about the Group's vision in this regard.

When was the Digital Transformation Division formed?
Altri's Digital Transformation Division was formed in 2021. We gradually analysed and identified the potential for progress in this area. We started with a report developed together with McKinsey which was the launch pad for the project within Altri. The report was carried out in the first semester of 2021. By the end of this project we had an overview of some areas of the organisation, an assessment of the potential of a set of ideas, which could produce some very interesting results and for which we put together proofs of concept.

Who's on the team?
We took our time to think about the team, to try to work out which set-up would best suit the situation at Altri, and we settled on a team of four. Carla Duque, who has a lot of experience and work under her belt in the area of process engineering, from the fibre line to the area of recovery and energy, brings a very solid base to the team, contributing towards ensuring that the tools developed are tailored to the operations. Rui Ligeiro, from projects and asset management, has throughout his career worked very closely with engineering and methods, and is tasked with driving projects related to asset management and with issues of reliability and operational efficiency. Finally, we have Hugo Guimarães, a data scientist who has been with us since October 2021, and who is in charge of data analysis and designing tools which will enable us to work the information generated by the company activity, seeking answers to the questions we are asked and the challenges posed.

It's been more or less a year since the Digital Transformation area was created. How would you assess the work that's been done?
During this initial stage we haven't been as successful as we'd like. The number of projects presented to us fell short of everyone's expectations. Maybe it's a question of perception, since the Altri organisation, from the factories to the other areas, clearly haven't regarded digital transformation as having the potential to solve their problems. We obviously didn't communicate that properly and we have work to do here: we have to explain what we are able to do and how we can help in the various different areas of Altri.
It's true that what we've all just been through didn't help. The limitations imposed by the lockdown restricted the availability of personnel in all operating areas, and therefore they probably weren't as able to work on these issues as they could have been. In addition to this, some internal moves at our end forced us to make alterations to our team structure, which also disrupted the pace of some projects.

How would you like to be perceived?
The best thing would be for the organisation to regard the digital transformation team as a tool. I hope the operating areas, from A to Z, and not only the industrial areas, look at us as a team that helps to resolve issues, helps to meet the challenges which arise in every area. We're able to analyse data and test hypotheses and try out any ideas that are brought to us, but above all, our Altri colleagues have to ask us challenging questions. We understand what factories have to deal with, and although our intention is to become physically more present, it will actually be easier and

Digitization has already taken place in our three factories. From the technological point of view we are in the front line.

The Digital Transformation Department team at Altri . Rui Ligeiro, is the Specialist in Asset Management and Operational Efficiency; Gualter Vasco, is the Director responsable for Altri's Digital Transformation Department; Carla Duque is Process Translator and Hugo Guimarães is the team's Data Scientist.

more normal for those who work in the operational areas to provide us with a springboard, since they're the ones who are better equipped to identify their needs and priorities.

How do you regard digital transformation at Altri?
Actually, using digital tools is not new to us here at Altri; we've been using these types of tools for a long time to support the efficiency levels we demand in our operations. This has mostly been developed at factory level, often with localised initiatives targeted to that specific area.
By putting together this dedicated team, we are aiming to resolve issues across the Atri group as it is today. For example, in terms of factories, we are no longer three units each with its own reality and its own problems: although each factory still has its own identity, they are all increasingly aligned with each other, and so it's perfectly normal and advantageous to take a coordinated approach to the challenges and search for solutions. And this applies to other operational areas where the cross-over is even stronger.

But how is this specifically implemented at Altri?
The approach depends on the nature of the project. If the aim is, for example, to dematerialise or digitalise a process, then we essentially have to work in terms of software packages. If we're dealing with projects which involve industrial equipment, there's a set of prerequisites which have to be guaranteed beforehand. We can't do anything until the equipment has been sensorized; this is the basic layer of technology upon which everything else will be built. Then we have to ensure that the information gathered by the sensors is processed and stored. Finally, we have to build the models which will answer the questions posed or enable us to test the operational scenarios being analysed.
To give you a specific example, we have a model to monitor the condition of a machine or motor. One of the parameters we usually monitor is its vibration. In the conventional approach which is still most often used today, the vibration is measured by a specialist technician who has to go the machine's location with a measuring device, take the measurements, log them, return to the office, and upload the information onto the maintenance management system. Someone subsequently has to analyse the figures and ascertain whether or not there is a potential problem. Now it's possible to have the vibration sensors connected up to the systems, gather the readings round-the-clock and even monitor them in real-time to see how they are evolving. It's now possible to have alarms triggered when a certain number is reached or exceeded.

In practice, does it allow you to do predictive maintenance?
Yes, that's exactly it. The tools we have at our disposal enable us to monitor the trend, and more than just analysing the log, we can develop a model of the machine which can let us "guess" when it's going to become faulty. In other words, we can do predictive maintenance of the equipment. And we can do lots of things using this information: we can decide whether to schedule a stoppage in time to prevent the fault from occurring or adjust the machine's operating conditions to "delay" the fault. If the model indicates that there's going to be a failure in two weeks' time and it won't be convenient to suspend operation, and we don't want

ALTRI SMART DATA

Easy access to information

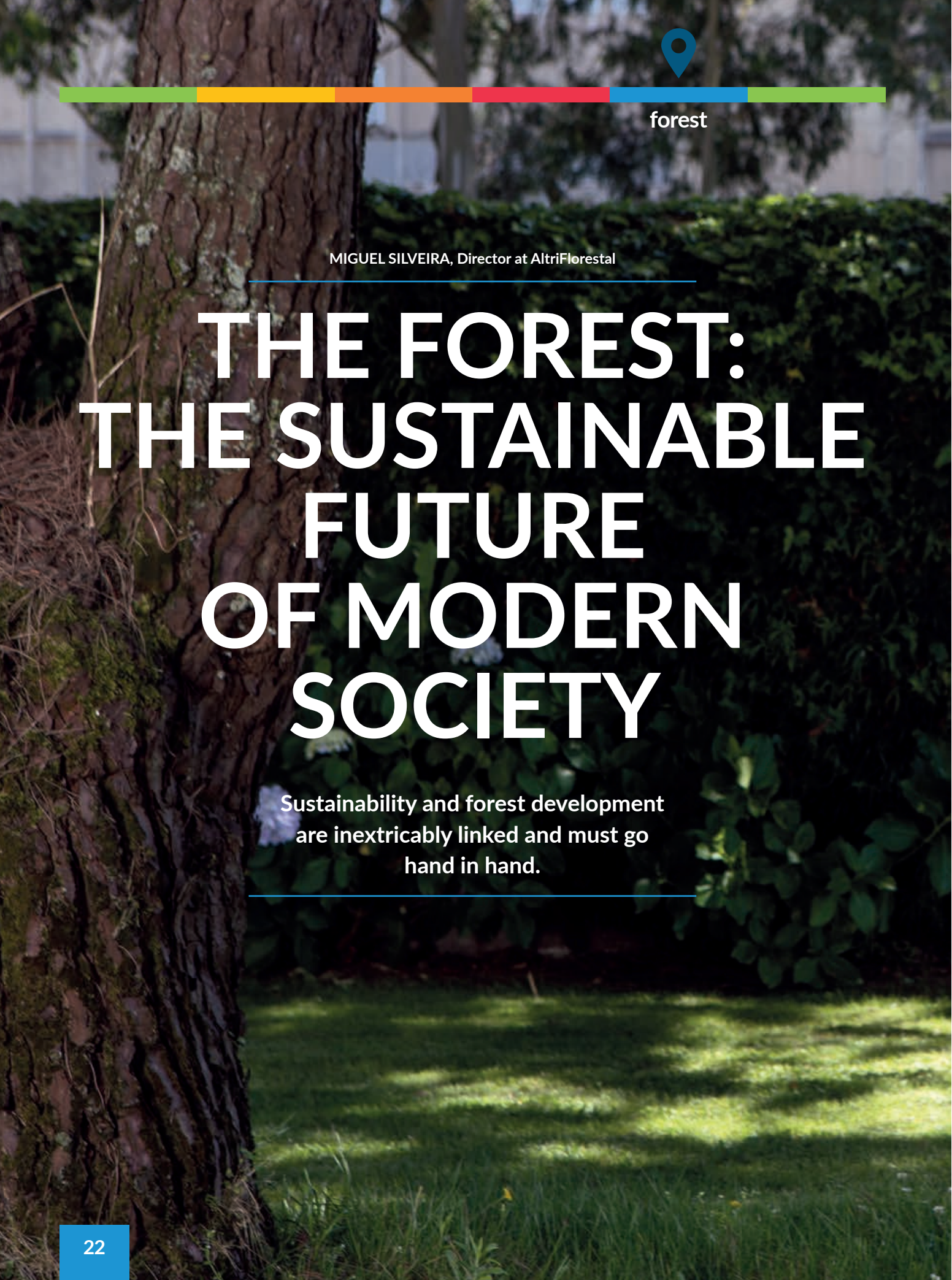
Altri Smart Data is a project arose to meet a need throughout the entire organisation: the need for easy access to information pertaining to business activity.
Much more effort is required to access and deal with the information than could reasonably be expected.
Altri Smart Data entails making an inventory of data sources and of those responsible for data validation. It's a structural project, intended to guarantee that information is made available to those within the organisation who need to have access to it.

the machine to have a failure, is it possible to run the equipment differently, to buy time, so that instead of in two weeks from now we can schedule a stoppage later on when it's less inconvenient?

Which stage of digital development is Altri in right now?
As I said before, digitalisation was implemented in our three factories some years ago. From a technological standpoint, we are at the forefront. I would even go as far as to say that it's a characteristic of our business sector in Portugal, which is a

European and global benchmark. Companies can only set the benchmark by being at the forefront in terms of technological solutions, and at Altri we have solutions which fit into the concepts of digital transformation.

In which areas have you done the most work?
Clearly in those areas supporting our industrial operations. We meet our factories' needs by focusing on creating tools which simplify the way some of the tasks are performed, reinforcing mobility and shedding light on the role played by everyone involved, at every step of the way. For example, equipment consignment is now carried out using a computerised tool, which makes the process more streamlined, robust and easily traceable. Another example is scaffolding management in the factories, which is now done digitally, from the initial request to disassembly. Again, this simplifies the process and improves the tools available to our teams in order to fulfil the requirements of the operations and to manage contracts with service providers. We have a large-scale project underway, with IBM, to create tools to manage stoppages and major maintenance operations.
The area of asset management is where we have done the most work and where there are more projects in the pipeline; we have around twenty ideas for this area, particularly for predictive maintenance and optimisation of operations. But we've also done work in other areas, ranging from a model to aid decision-making when it comes to using chemicals according to consumption and market prices, to a tool we developed at the request of the finance department, to monitor our customers' profiles and foresee any issues relating to orders and payment.



MIGUEL SILVEIRA, Director at AltriFlorestal

THE FOREST: THE SUSTAINABLE FUTURE OF MODERN SOCIETY

Sustainability and forest development are inextricably linked and must go hand in hand.

We have already established that a successful relationship between sustainability and the forest must involve a perfect combination of all the different variables inherent to modern society.

Let's start with the forest, from which mankind has always benefited, and which has from time immemorial been an invaluable source of raw materials and a resource without which we cannot live.

Now let's look at sustainability, a more recent concept which revolves around the need to guarantee that this source of revenue, goods and services does not die out but remains healthy for centuries to come, and which aims to improve its quality and quantity.

A forest which is not sustainable, is one which is ultimately doomed.

The way Portugal's society has become more urban has meant that we are turning our backs on the forest and ignoring the need for it to remain sustainable. This physical distance has led to an idealised view of a bucolic idyll, which is very different from what a sustainable forest should actually be. And it is this unrealistic perception which ends up causing many of the problems currently facing forests and which push them further and further away from sustainability.

A SUSTAINABLE FUTURE FOR THE FOREST

The forest plays a vital role in today's society. For a start, it is vital in combating climate change, due to its carbon sequestration capacity and role as a carbon sink, but also through all the ecosystem services it provides.

Taking this pivotal role into account, society has to grasp that that forests are a key asset and are vital to our wellbeing, and it is therefore crucial that they be properly managed, balanced and profitable. This is the only way to ensure that despite being located far away from urban centres, forests remain relevant in helping to sustain a modern society which increasingly needs to draw on the full potential of forests which are sustainable.

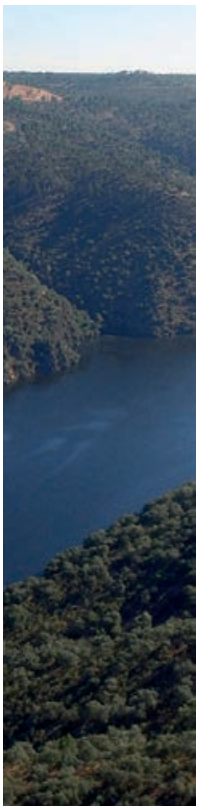
The major challenge we face today is to find ways to give our forests a sustainable future.

COMBATING RURAL DESERTIFICATION AND ABANDONMENT

There are many challenges that arise in our pursuit of this goal, one of the main ones being the abandonment of land and social desertification of rural areas.

According to official data, mainland Portugal has around 3.5 M hectares of forest , which accounts for around 39% of its continental land area. If we look at the country divided into North

It's necessary to create incentives for increased management, especially in areas of eucalyptus forest, creating incentives for renewal whith improved plants and greater management, seeking at the same time to install new forest areas.



and South by the Tagus River, we can see distinct differences, which must involve distinct solutions.

Roughly speaking, larger properties are predominant in the south, with much of the land area occupied by native species with a low density of trees per hectare. This zone of the country is much easier to manage and the agroforestry system in place is conducive to reducing fire risk which therefore makes it a more appealing area to manage.

IMPACT OF CLIMATE CHANGE

Nevertheless, this territory is subject to climate change, and we must continue to prepare for the future with forestry options which are appropriate to this context. A new approach is therefore needed, which includes genetic improvement, and better practices in terms of land coverage, density, and pastoral intensity, among other things.

It is in the North where we encounter greater difficulties, given the higher rate of land abandonment and greater fragmentation of land properties.

According to a document by the Grupo de Trabalho para a Propriedade Rústica {Working Group for Rural Property}, 85% of Portugal's rustic buildings are concentrated in the Centre and North of the country, which account for 54% of the total area of Portugal. The average area per item also differs hugely between the regions of the country, with 0.6 hectares in the Centre region contrasting with 9.9 hectares in the Alentejo.

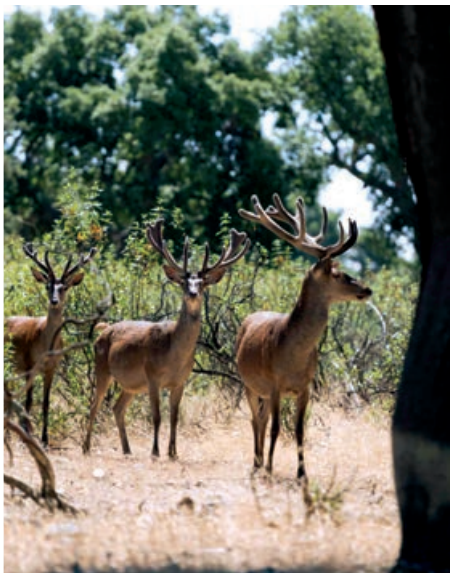
This greater fragmentation in over half the country, together with the aforementioned land abandonment (a lack of management and, among other reasons, an absence of a land register) all lead to a heightened risk of fire.

According to data from the ICNF {The Institute for Nature Conservation and Forests}, up until 15th August 2022 around 75% of forest fires occurred in the Central and Northern regions of the country, with a total of around 80 thousand hectares burnt.

This situation causes a downward spiral whereby the higher fire risk causes management to be reduced or withdrawn, leading to increased land abandonment, which in turn then leads back to increased fire risk.

REDUCING CO_2 EMISSIONS

Today's society and the whole environmental situation obliges us to pay very close attention to decarbonisation, with the aim of, one on hand, endeavouring to reduce consumption of fossil fuels and, on the other, increasing carbon sequestration and carbon sinks.



A static forest which neither grows nor is profitable, cannot contribute towards society's wellbeing.

In pursuing its mission, Altri's goal has been to seek to reduce emissions by using hybrid vehicles in its forestry operations (the Group currently has 8 functioning pieces of machinery), and in the area of carbon sequestration/sinking, it employs sustainable forest practices and uses genetically improved material, thereby increasing the CO2 fixation rate and leading to a decrease in areas burnt (fire-fighting and prevention via AFOCELCA). Ensuring productive, healthy and sustainable forests is the only way to prevent fires, and unless we do this Portugal's current high forest fire statistics will continue to be an unresolved problem.
All forestry policies must take into account the fact that the forest is directly related to the wellbeing of society in many different ways, from acting as a carbon sink/sequestrator, to providing society with countless products - from paper to textiles - and services – protecting soil and water quality.

THE PATH THE COUNTRY MUST TAKE WITH THE FOREST

It is therefore vital to understand that a static forest which neither grows nor is profitable, cannot contribute towards society's wellbeing. We absolutely must encourage a forest of production, conservation and leisure, as this is the only way to fulfil the current demands of a modern and urban society.
In Portugal, we can do this. We have excellent conditions in place to ensure that these different functions can coexist. Nevertheless, in order to achieve this, we need to create incentives to increase management, particularly in areas of eucalyptus forest, by creating incentives to renew them with improved plants and increased management, while simultaneously seeking to set up new areas of diversified forest with native broadleaf trees, using the eucalyptus forest as leverage to expand the area of forest and increase productivity and thus profitability. Only by doing this can we put a brake on the downward spiral, increasing the rate of sequestration (eucalyptus has the highest sequestration rate) and carbon sink (expanding the area of forest).
Society depends upon the forest (among other things) for decarbonisation, for renewable products, and for ecosystem services. We have to grasp this notion, for the sake of our own future.

1) DGT {Directorate-General for the Territory} – Land Use and Occupancy Charter for 2018
2) 1st Phase Report – Diagnosis (Feb 2022)
3) 4th preliminary report:1st January to 15th August 2022

CARLA DUQUE

Process Engineering at Celbi

How long have you worked at Celbi?
Seven years.

Have you always had this job?
No, when I first joined Celbi I was in the Industrial Management department, and I've been working in Digital Transformation and Asset Management since January of 2022.

Tell us about your journey at Celbi.
I initially came to Celbi in 2014/15, on a work placement in the Industrial Management department, in the area of energy management. In 2016, I joined the Industrial Management team where my job was to perform the monthly and annual statistical analysis of the production process, basically analysing chemical consumption and use of water, and monitoring the energy management system. On top of that I subsequently started doing the analysis and weekly and monthly reporting of the variable and fixed costs for the industrial management department. In January 2022 I joined the digital transformation and asset management team, in my current job.

What's your day-to-day life like at the company?
Right now I'm taking part in several projects where we have identified where there's room for improvement within the scope of Digital Transformation. There's a lot of variety in terms of the projects being developed, from creating databases to ensuring they are harmonised across the entire group, and using this data to develop and define the indictors to be used by the different management departments to help in their decision-making.

What's the most fulfilling part of your job?
The part I most enjoy is interacting with people, which helps me to understand the main problems in the process and to provide support by developing tools to optimise it.

It's therefore clear to see that Altri is fully committed to promoting the Circular Economy, by reusing all its by-products and striving to enhance all its waste products by ***bolstering their economic value, to help create a more sustainable planet.***

MIGUEL SILVA, CFO at Altri

Read the full article on page 10.