SONAE ARAUCO

Taking wood further

Innovation in sustainability

VALUE CARD

Contributing to the creation of a sustainable future, with wood-based solutions

V2W

Value2Win

1. Intro

Sonae Arauco believes that Innovation plays a central role in transforming business models, supply chains, and consumer behavior towards circularity. This includes the use of sources with a low carbon footprint, including raw materials and energy, the application of the best practices in production and recycling technologies, and the development of sustainable products.

By fostering a culture of innovation and investing in research and development, we can pave the way for a sustainable future, where economic growth, social well-being and environmental protection go hand in hand.

2. Innovation in sustainability features

- Implementing an open innovation process allows us the collaboration with institutes, suppliers and customers.
- Implementing a development model with key indicators for value creation and sustainability enables us to develop new and improved wood solutions for construction and furniture applications.
- Adoption of state-of-the-art equipment and partnerships with key suppliers allows us to continuously improve our production process to maximise the efficient use of resources.
- Adoption of renewable energy is transforming the way we generate power, decreasing our dependence on non-renewable sources and reducing greenhouse gas emissions.

3. Figures

8 FTEs — Implementation of a training program in Innovation and Eco-design

38 — Ideation sessions with external partners and Innovation Forum (38 associates involved)

53,000 — More than 53,000 hours spent by Sonae Arauco teams in Innovation projects

Multiple — Participation in several International and Collaborative projects (e.g., EcoReFibre, Activas, ADM.IN, Friendship, Agenda transForm)

COTEC 25 — Recognised with the COTEC 25 INNOVATOR status by COTEC Portugal (Business Association for Innovation)

4. Customer value

- Enhance brand reputation: partnering with an innovative climate-responsible supplier reinforces brand's image.
- Guarantee future-proof supply and long term competitiveness: a supplier committed to innovation stays ahead of industry trends and technological advances on sustainable products.
- Collaborative growth: working closely with our Product Development team brings opportunities for knowledge sharing and co-development.
- Circular partnership: access to products and services designed to promote the circular economy and recyclability (eg. collection of waste wood).

5. Case Studies

R&D Sustainability Projects

Increasing circularity is a strategic issue for Sonae Arauco. We are truly committed to our circular bioeconomy model and the cascading use of wood, and the integration of recycled wood into our MDF portfolio is a very important development towards this goal. Below are two examples of ongoing projects that will generate the necessary knowledge of the full process, opportunities, and risks to implement a reliable MDF recycling process.

1. CircularWood Project

Background

CircularWood is a collaborative project coordinated by Sonae Arauco, part of the Portuguese Agenda transForm. The Agenda transForm represents an unprecedented effort of sectoral cooperation, involving 56 partners in 30 collaborative projects and aims to bring a structural transformation of the forestry sector, addressing the entire value chain. The mission is to make a significant contribution to sustainable forest management, optimise industrial processes, boost the competitiveness of the sector, and ensure greater connection to markets and consumers.

CircularWood is completely aligned with Sonae Arauco's targets and will develop and implement an innovative industrial-scale process to produce high quality products increasing the recycled wood incorporation.

The most relevant innovation step is related with the sorting of post-consumer MDF and the process to generate recycled fibers with the adequate homogeneity and quality to be used in the MDF production.

The CircularWood project 2023-2026 has received funding from Component 5 (C5) of the Recovery and Resilience Plan (RRP) from Portugal.

Goal:

Replace up to 10% of virgin fibers with recycled fibers from post-consumer MDF, in MDF product range.

What has been done until now:

- Benchmark and pilot scale testing of different sorting equipment to separate a MDF fraction from the wood waste stream;
- Benchmarking and pilot testing of different technologies to recycle MDF, generating “open fibres” that can be incorporated in the production process;
- Laboratory testing of the impact of recycled fibres on MDF properties; Design of a new MDF sorting and recycling process;
- Selection of the partner to work with us on the industrial installation;
- Installation of an infrastructure and equipment for the new MDF recycling and sorting process. This pioneering recycling line aims to transform end-of-life MDF fiberboard into valuable raw material for new fiberboard production. Located in Mangualde industrial unit, it is the first industrial-scale fiberboard recycling line globally.

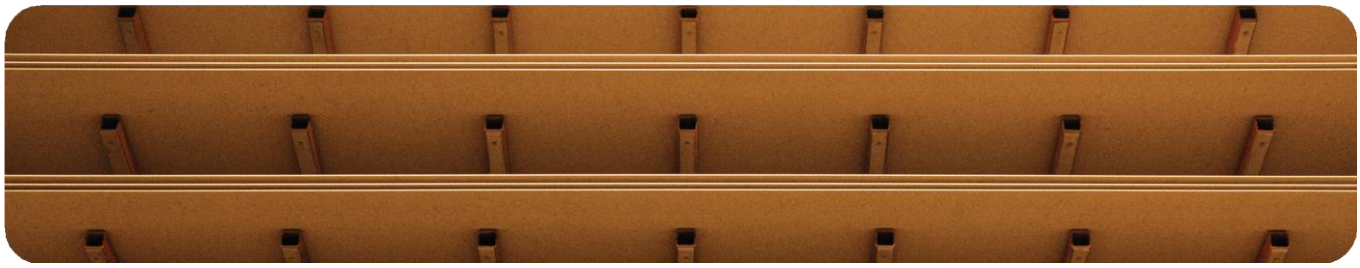
This project is a perfect example of Sonae Arauco’s sustainability and innovation agenda and our commitment to develop functional and renewable wood solutions. We are confident that we will achieve a positive outcome with the installation of the world’s first dry fiberboard recycling line, in Mangualde (PT), and we will continue the work to optimise the solution and extend the benefits along Sonae Arauco industrial plants.

2. EcoReFibre project

Ecological Solutions for Recovery of Secondary Raw Materials from Post-consumer Fiberboards.

EcoReFibre is a research project focused on developing and demonstrating innovative, environmentally sound and commercially viable technologies for recycling end-of-life fiberboards (MDF).

The project brings together a strong pan-European consortium of leading research institutes, industrial partners and European associations to address one of the sector's most pressing challenges: the growing volumes of post-consumer fiberboard waste. With fiberboard production capacity increasing, it is estimated that more than 60 million tons of fiberboard waste have been generated in Europe over the past five years.



EcoReFibre aims to enable the circular recycling of post-consumer MDF by generating reliable market data on waste availability across Europe and by developing the technical conditions for its high-value reuse in new wood-based panels.

Within the project, Sonae Arauco validates, at both laboratory and industrial scale, the incorporation of recycled fibers from innovative recycling technologies into MDF production, targeting up to 25% substitution of virgin fibers. Additionally, the project develops an alternative technology to process post-consumer MDF, enabling its use in the external layer of particleboard, thus expanding its application potential and improving circularity.

The company also contributes technical expertise to life-cycle and economic assessments, supporting a synergistic circular economy approach with multiple valorisation pathways for recycled raw materials.

The project's value proposition includes increased fibers efficiency through cascade use, a reduced carbon footprint of fiberboards, improved overall sustainability, lower production costs, and enhanced recyclability of MDF products, shifting waste streams from energy recovery to material recycling.

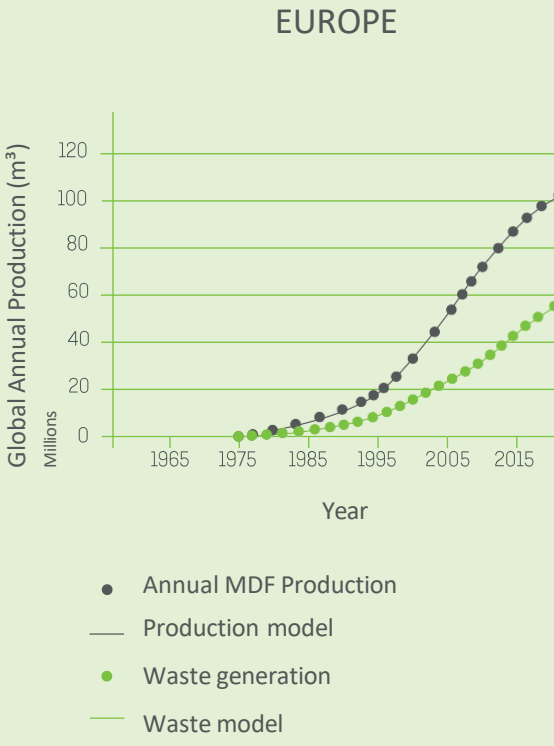


TABLE: The global production of MDF (FAOSTAT) and predicted waste generation.

20	4 years'	€14,819,221
Participants	Duration	Budget

Goals:

- Replace up to 25% of the virgin fibers currently used in the manufacture of new fiberboards.
- Introduce recycled fibers as fine particles into the particleboard surface layers, to replace the use of sawdust.

Results until now:

To date, EcoReFibre has achieved substantial progress across all core project areas:

- Integrated sorting, extraction and valorisation approaches have been successfully demonstrated, enabling the production of recycled fibres from post-consumer wood for incorporation into MDF and other high-value products.
- Over 95% purity achieved through intelligent sorting of post-consumer wood and fibreboard.
- At the Meppen plant, post-consumer wood has been successfully integrated into MDF production without compromising board quality.
- Recent industrial-scale trials carried out at the Meppen and Nettgau plants validated key project developments.
- These trials confirmed the technical feasibility of incorporating recycled fibres into MDF production and recycled MDF fines into Particleboard surface layer at industrial scale.
- Complementary activities are well underway, including:
  - data-driven process optimisation,
  - life-cycle and economic assessments,
  - extensive stakeholder engagement.

For more information about these projects:

CircularWood EcoReFibre

The EcoReFibre project 2022-2027 has received funding from the Horizon Europe research and innovation program under the grant agreement no. 101057473.

3. Renewable and Bio-based Resins

Background

Chemicals, particularly resins, are the largest contributors to the company's Scope 3 CO_2 emissions. As essential components in PB and MDF production, they account for a substantial share of the overall carbon footprint of both our operations and our final products. For this reason, the transition toward bio-based and lower-carbon resin systems represents one of the strategies for reducing Sonae Arauco's greenhouse gas emissions. Their potential lies in replacing fossil-derived components with renewable raw materials, reducing the carbon footprint of our products while opening the door to safer, low-emission solutions.

Our stated ambition is clear: we aim to increase the use of non-fossil resins, actively seeking alternatives with lower carbon footprints. In the coming years, we intend to take further steps toward defossilisation, including the adoption of resins made partly or fully from renewable feedstocks. Biomass-balanced resins, in particular, present an attractive pathway, allowing fossil feedstock to be replaced with sustainable biomass without changing the final chemistry or affecting product performance.

Over the past few years, our R&D has made significant progress in understanding and developing these alternatives. More than 15 bio-based resin systems have been tested, providing valuable insights into their performance potential, their sustainability advantages, and the barriers that must still be overcome.

Goal:

Develop fully bio-based and formaldehyde-free resin systems for the industrial production of PB and MDF

The SusBoard Project: Accelerating the Transition to Renewable Chemistry

The project focuses on synthesising and optimising adhesive formulations based on polylysine and HMF-containing activated sugars, with the ultimate objective of meeting industrial performance standards while ensuring environmental, economic, and health and safety standards.

9	4 years	€9,100,000
Participants	Duration	Budget

What has been done until now:

- Production of PB and MDF boards at laboratory scale with adjustment of production conditions, incl. press cycle, temperature, etc.
- Life cycle assessment (LCA) of the different bio-based resin prototypes;
- Preliminary cost assessment;
- Monitoring of volatile organic compounds (VOCs) and formaldehyde emissions;
- Design and preparation of industrial production of the bio-based resin.

Results until now:

The first set of results is very encouraging. The laboratory trials show that the new resin systems can deliver performance comparable to traditional UF resins while fully meeting the required European standards. The PB panels achieved internal bond values well above the EN 312 minimum, confirming that the formulations already provide strong and reliable bonding. At the same time, our work now focuses on identifying the formulation that offers the best balance between performance, cost, and carbon footprint.

In the next phases of the project, the most promising resin formulations will be scaled up and tested under industrial-scale conditions to evaluate process stability, scalability, and long-term performance. These trials will provide critical data for industrial implementation and market introduction.

A Forward-Looking Perspective:

Bio-based resins and biomass-balanced resins will play an increasingly important role in reducing the carbon footprint of our products and supporting Sonae Arauco's long-term decarbonization strategy. While they will coexist with UF resins in the short and medium-term, their relevance will grow in specific product segments where value, performance, and sustainability converge, illustrated by solutions such as Biorefiber X, a product recently announced by Sonae Arauco as a next-generation low-carbon panel that integrates renewable raw materials and marks a significant step toward more sustainable board manufacturing.

In 2026, we have already certified our industrial units of Mangualde and Euroresinas for ISCC Plus, allowing us to use mass-balance resins for the production of MDF.

For more information about the Susboard project: SusBoard

The Susboard project 2025-2029 has received funding from the Horizon Europe research and innovation program under the grant agreement no. 101213812.

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