

impact insights / 2024



# ECBF

## Cultivating Lasting Value

EUROPE'S FIRST VENTURE FUND EXCLUSIVELY

FOCUSED ON THE BIOECONOMY

Disclaimer:

This publication constitutes a marketing material and is to be read in conjunction with the private placement memorandum (PPM) of ECBF I SCSp, including the pre-contractual disclosures of ECBF I SCSp. Prepared by ECBF Management GmbH, it provides general information on sustainability topics within data confidentiality limits. This publication does not constitute an offer or solicitation to invest in the assets or shares of funds advised by ECBF Management GmbH. Past performance is not indicative of future results.

Summary:

Discover ECBF.vc's journey as it makes impact a competitive advantage. "Impact Insights 2024" highlights ECBF's stewardship and value creation, illustrating how digital reporting infrastructure and strategic engagement empower ventures to thrive in a future shaped by the need for industrial resilience and sustainable business practices.

Author:

Clara Martinez

Co-authors:

Tobias Schomerus and Cornelia Frentz

Marketing and Communications:

Cornelia Mann

Acknowledgments:

We extend our sincere gratitude to everyone who contributed to this publication. Special thanks to ECBF Partners, whose invaluable encouragement was instrumental in shaping the perspectives shared in these insights. We are deeply grateful to our portfolio companies, their dedicated founders and team members, who generously shared their expertise and demonstrated strong engagement with ESG practices. Thanks to Isabel Vercauteren, Martin Plambech, Jean-Francois Dechant, Jesse Moerkerk, Stefano Babbini, Reetta Södervik, Linda Mols, Elselina Battenberg, Boštjan Božič, Bernat Añños, Sophie Roelants, Zachary Ricklefs, Floriane Loup, Sandra Weiner, Emeline Flores, John Casey, and Pascale Danielou. Your insights have greatly enriched the depth and quality of this publication.

ECBF Management GmbH

[www.ecbf.vc](http://www.ecbf.vc)

Poppelsdorfer Allee 17, 53115

Bonn, (Germany)

## Welcome

Dear fellow investors, founders and friends,

The world is undergoing unprecedented change. According to the Global Risks Report 2025 published by the World Economic Forum, half of the top ten global risks over the next decade are environmental—with climate change, resource scarcity and biodiversity loss among the most pressing threats. Our ecosystems, economies and societies are approaching critical thresholds and capital must play a decisive role in shaping the response.

The European Circular Bioeconomy Fund (ECBF) was founded with the conviction that sustainable investments are not only essential for planetary health but also a powerful engine of value creation. With our first ECBF fund and future funds, we have deepened this commitment and offer investors a front-row seat in the transformation of entire industries through bio-based innovations.

Today, investing in sustainable bioeconomy and circular economy solutions is no longer optional—it is essential to ensuring global survival and prosperous economies. Across all sectors, innovative technologies, business models and materials are replacing fossil-based inputs and transforming linear systems. Renewable, bio-based and circular solutions are more relevant than ever to tackling climate change, biodiversity loss, environmental pollution and resource depletion—challenges that now dominate global political and economic agendas.

At ECBF, impact is a competitive advantage. We back visionary European entrepreneurs building scalable, science-based solutions that deliver measurable environmental benefits and strong financial returns. Our active stewardship model, deep sector expertise and ESG integration practices allow us to identify and unlock long-term value, mitigate risks and prepare portfolio companies to thrive in a future defined by the need for resilience and stricter regulation around sustainability. ECBF Impact Insights 2024 provides a transparent overview of how we put these principles into action. From rigorous environmental, social and governance (ESG) monitoring and a digital reporting infrastructure to strategic engagement with investees, ECBF is redefining what impact venture capital can achieve. Our portfolio companies not only meet compliance requirements—they have the potential to outperform on impact, innovation and growth.

For limited partners (LPs), industry players and other investors seeking exposure to high-potential, innovation-driven sectors like industrial biotech, ag tech, food tech and biomaterials—sectors that are the key to Europe's climate transition and healthy biodiverse ecosystems—ECBF offers a unique opportunity to align impact with returns and invest in real scalable solutions at a critical moment in time.

We invite you to join us to discover innovative and impactful companies, but also to co-create the future.

ECBF General Partners,



Dirk Saßmannshausen



Michael Nettersheim



Michael Brandkamp

## Acronyms

<b>CEO</b>	Chief executive officer
<b>CSRD</b>	Corporate Sustainability Reporting Directive
<b>DD</b>	Due diligence
<b>DNSH</b>	'Do No Significant Harm' principle
<b>ECBF</b>	European Circular Bioeconomy Fund
<b>EIB</b>	European Investment Bank
<b>ESG</b>	Environmental, social and governance
<b>EU</b>	European Union
<b>FTE</b>	Full-time equivalents
<b>FY</b>	Fiscal Year (12-month accounting period)
<b>GHG</b>	Greenhouse gas
<b>ILO</b>	International Labour Organization
<b>LP</b>	Limited partner
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>PAI</b>	Principal Adverse Impact
<b>PRI</b>	Principles for Responsible Investment
<b>SFDR</b>	Sustainable Finance Disclosure Regulation
<b>UN SDG</b>	United Nations Sustainable Development Goals
<b>UNGP</b>	UN Guiding Principles on Business and Human Rights
<b>VC</b>	Venture capital

## Contents

WELCOME	03
ABOUT ECBF	06
CREATING VALUE	10
SCALING WITH ACCOUNTABILITY	16
STRENGTHENING RESILIENCE	24
A PORTFOLIO WITH IMPACT	28
CONCLUSION	64



# About ECBF



“At ECBF, we mobilise capital exactly where science, sustainability and competitiveness intersect—cultivating a new class of European champions whose bio based innovations decarbonize industry, regenerate ecosystems and pursue attractive risk adjusted returns for our investors.”

Dirk Saßmannshausen, Managing Director

## About

ECBF is the first private venture capital fund in Europe exclusively dedicated to the bioeconomy<sup>1</sup>, including the circular bioeconomy (onwards bioeconomy). We invest in visionary European entrepreneurs who are driving the shift from a fossil-based to a bio-based economy. ECBF is formally registered in Luxembourg as ECBF I SCSp and aims to catalyze the transition towards a sustainable future by investing in bio-based and circular late-stage companies with high potential for innovation, favourable returns and sustainable impact.

Having raised a total fund volume of more than EUR 300 million, ECBF is focused on deploying capital in impactful companies and building, holding and managing a portfolio of companies from the 27 countries of the European Union (EU) and the 16 countries associated with the EU's Horizon 2020 program<sup>2</sup>. As a late-stage venture capital fund, ECBF syndicates with private and public investors to bring technologies and bio-based products to market, offering flexible financing tools from equity to mezzanine.

ECBF invests in companies that leverage bio-based industries (i.e. whose production is based on renewable biological resources) and the circular economy (i.e. the conversion of by-products and waste streams into value-added products). Exciting opportunities have been identified in emerging value chains and the four industry verticals targeted by ECBF (Figure 1). These include ag tech, food tech, bio-based materials and industrial biotechnology, all of which encompass innovative technologies with applications in a broad range of end markets such as agriculture, nutrition, packaging, construction, textiles and personal care. ECBF refrains from investing in companies that focus exclusively on bioenergy and healthcare.

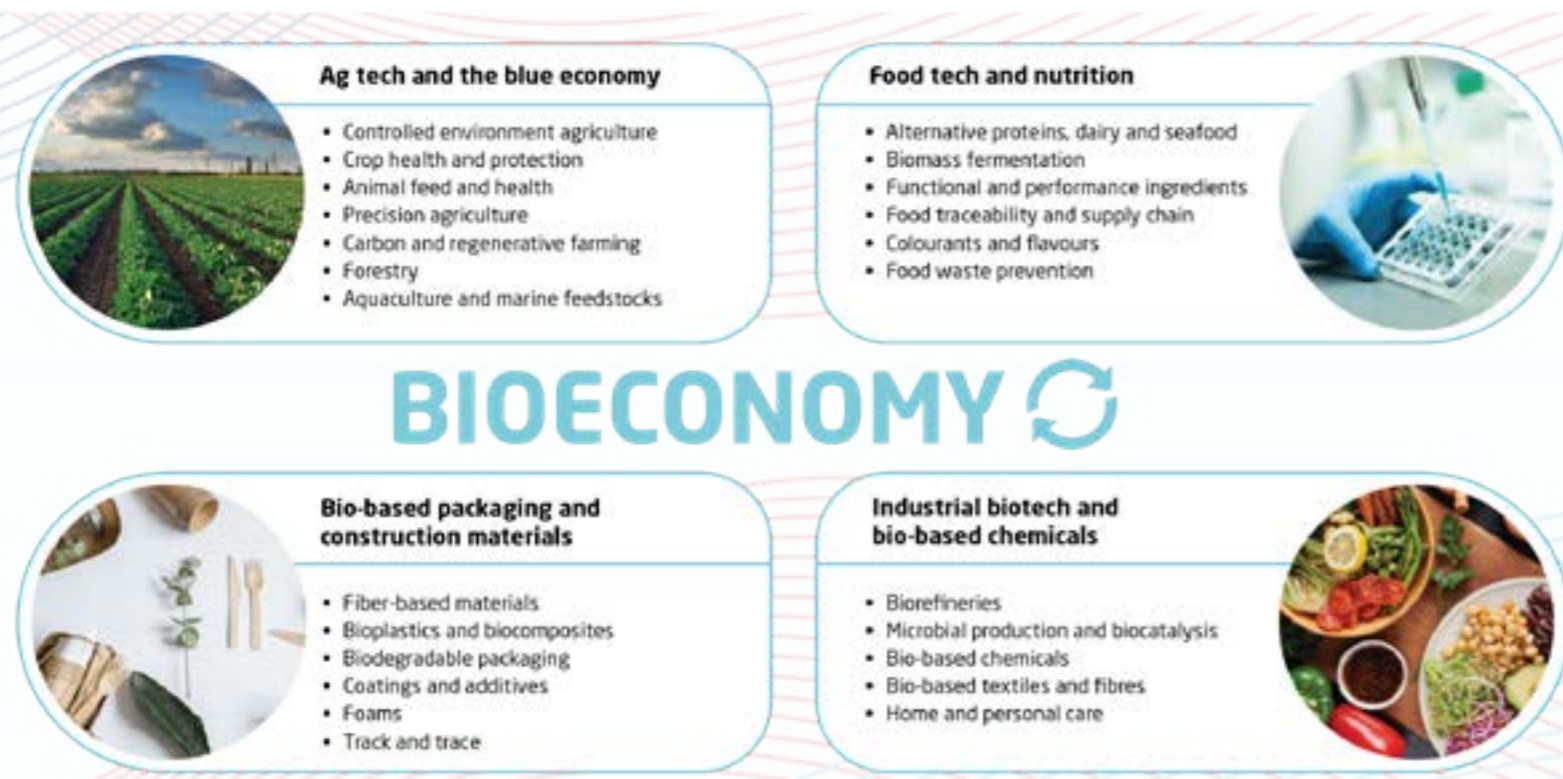


Figure 1: Industry verticals and sectors targeted for investment



## European Portfolio

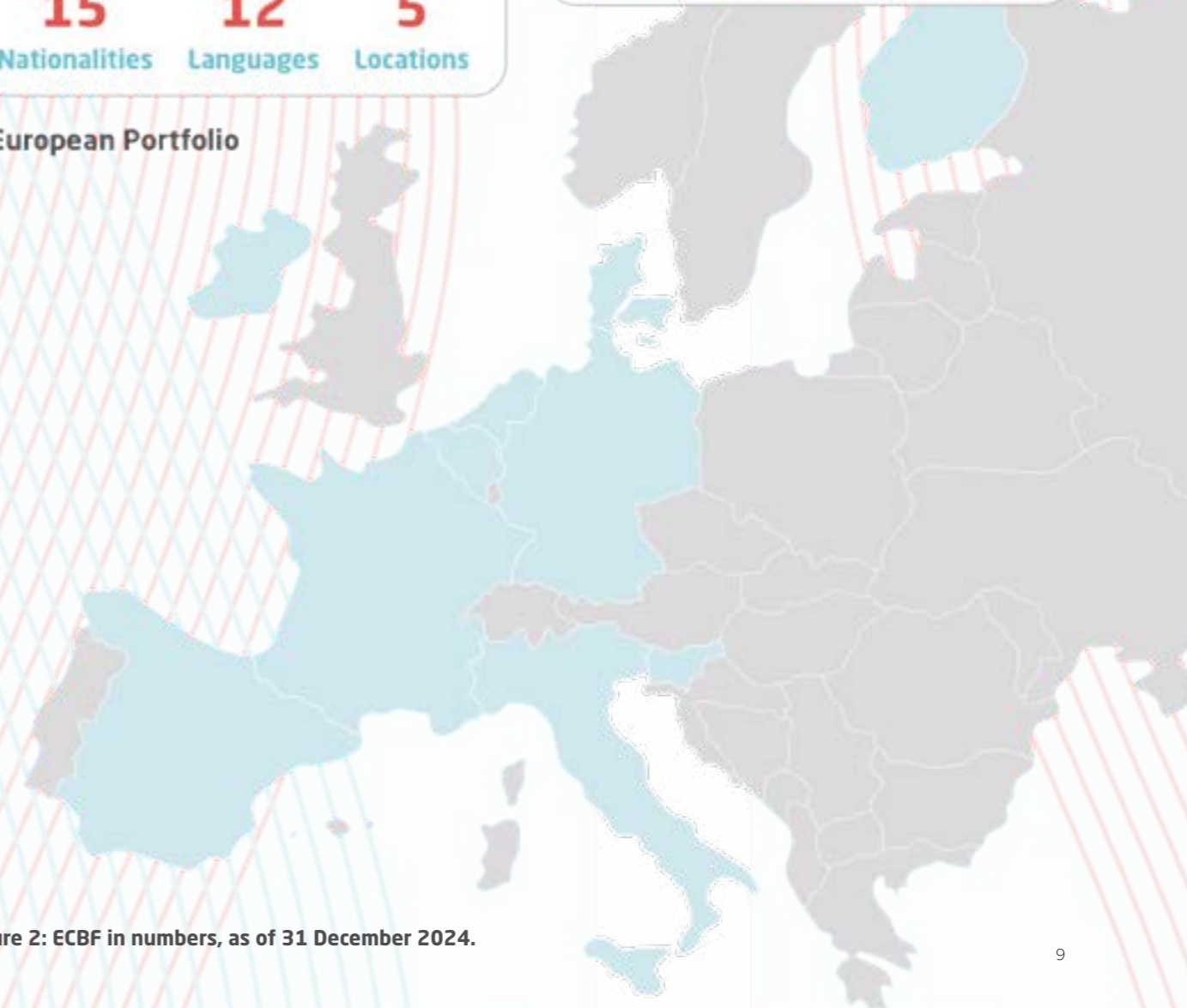


Figure 2: ECBF in numbers, as of 31 December 2024.

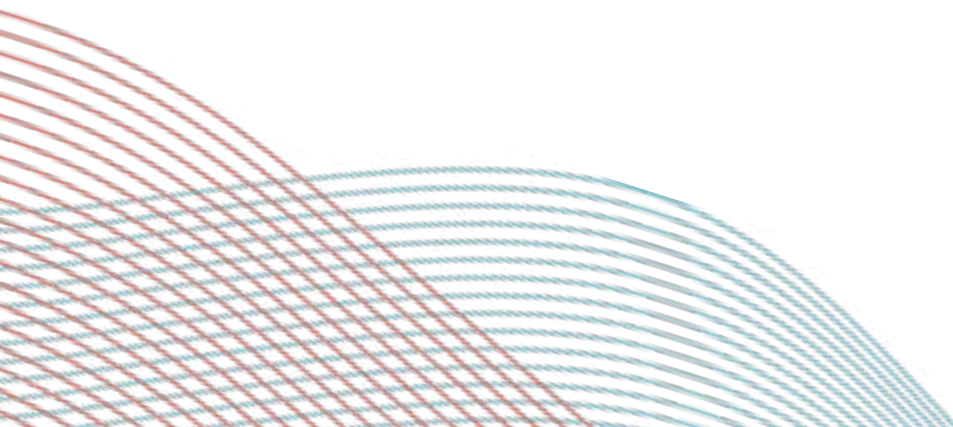


# Creating Value



“For us, value creation starts today with a ten-year vision—investing in the foundations of Europe’s future competitiveness. We are building a resilient industrial backbone by scaling transformative technologies and, through active ownership, empowering the companies that will drive a low-carbon economy once the current volatility has passed.”

Clara Martinez, Senior Manager Sustainable Investing



## Investing in the Bioeconomy

### Creating value for Europe's industrial future

**In a world shaped by escalating environmental risks and volatile geopolitics, Europe faces a clear imperative: to build an industrial system that is resilient, resource-secure, and low-carbon.**

ECBF is backing the next generation of companies which are building that future. By converting biological resources into high-performance materials, ingredients and technologies, bio-based ventures are reducing dependency on fossil-based and imported inputs. Whether by unlocking underutilized biomass, leveraging advanced biotechnologies or digitalizing agriculture and manufacturing to boost efficiency, ECBF portfolio companies are not just climate-aligned—they are commercially viable, industrially relevant and fundamentally value-generating.

Bio-based innovation is more than a lever for impact and sustainability. It is also a catalyst for value creation where it matters most: industrial transformation, resource independence and strategic competitiveness.

#### Building Europe's next industrial backbone

**The bioeconomy already generates EUR 2 trillion in turnover annually and supports over 17 million jobs in Europe<sup>3</sup>. However, its true potential lies in what it can unlock.** Europe's highly developed industrial base is increasingly constrained by its reliance on fossil-based inputs, imported raw materials and fragmented value chains. The bioeconomy may reverse this trend by enabling the domestic production of high-performance, sustainable intermediates from renewable biological resources.

What is at stake is the supply of intermediate bio-based products—biosurfactants, proteins, flavours, peptides and bio-based films—that serve as building blocks for every major industrial value chain. Investing in their production is investing in Europe's capability to manufacture future-critical goods, from next-generation foods to regenerative agriculture and low-impact packaging. These are the multi-billion-euro markets<sup>4</sup> where in which European science, technology and entrepreneurship can lead globally.

Technologies emerging from Europe's bioeconomy are already replacing petrochemical incumbents in high-growth sectors like packaging, agri-food, textiles and construction. Some examples are the commercial applications of precision fermentation, microbial biomanufacturing, AI-enabled agriculture and high-efficiency biomass valorization. With over 75% of the EU's biowaste still going uncaptured<sup>5</sup>, the untapped opportunity is immense—and so is the strategic importance of scaling solutions to valorize it.

#### Building Europe's next industrial backbone

**In the industrial context, resilience is no longer about managing inventory—it is about anticipating and mitigating systemic risks.** While the current geopolitical climate underscores the short-term urgency of national security, securing stable access to industrial inputs must also be recognized as a strategic priority. Ultimately, it is environmental degradation that poses the most significant long-term threat to such input access and economic stability<sup>6</sup> (Figure 3).

Sectors like AI, healthcare and defence may attract much of the venture capital spotlight today<sup>7</sup>. However, as environmental risks intensify due to resource depletion, ecosystem collapse and climate disruption, industry will inevitably turn to solutions that secure the foundations of industrial production. Investing in business models that integrate ecological thresholds into their value creation is a forward-looking strategy for leveraging the opportunities to adapt in a resource-constrained world.

Bioeconomy ventures diversify feedstocks, localize supply chains and reduce exposure to volatile imports like palm oil, soy-based feed and fossil-derived chemicals. Many have integrated circularity and efficiency at the core of their operations, enabling industry to adapt to policy shifts, climate shocks and market volatility.

ECBF's portfolio is good proof of this: materially reshaping how industry sources, produces and scales—creating regional jobs, localizing value chains and strengthening Europe's industrial autonomy.

#### The Global Risks Report 2025

##### Short term (2 years)

- 1st Misinformation and disinformation
- 2nd Extreme weather events
- 3rd State-based armed conflict
- 4th Societal polarization
- 5th Cyber espionage and warfare
- 6th Pollution
- 7th Inequality
- 8th Involuntary migration or displacement
- 9th Geoeconomic confrontation
- 10th Erosion of human rights and/or civic freedoms

##### Long term (10 years)

- 1st Extreme weather events
- 2nd Biodiversity loss and ecosystem collapse
- 3rd Critical change to Earth systems
- 4th Natural resource shortages
- 5th Misinformation and disinformation
- 6th Adverse outcomes of AI technologies
- 7th Inequality
- 8th Societal polarization
- 9th Cyber espionage and warfare
- 10th Pollution

● Environmental ● Geopolitical ● Societal ● Technological

Given long-term environmental challenges and investors' short-term focus, it is essential that capital continues to flow into bioindustries.

**Figure 3: Current risk landscape - Global Risks Report 2025, World Economic Forum (WEF, 2025)**

#### A strategic investment imperative

**Europe's bioeconomy is entering a decisive growth phase. VC-backed scale-ups face the challenge of transitioning from pilot to full industrial deployment.** However, success requires more than capital. It demands experienced hands-on investors to navigate complexity and accelerate scale-up. This is where ECBF adds differentiated value and de-risks investments leading rounds, syndicating with investors alike, and applying active ownership, rigorous ESG integration and sector-specific expertise.

We focus on value: climate value, economic value and industrial value. Our companies demonstrate that it is not a question of a trade-off but of multiplying impact. In 2024, they delivered total revenue of some EUR 80 million and cut GHG emissions 46% compared with relevant baselines.

Looking ahead, scaling up Europe's bioeconomy is an imperative. It is the next frontier for corporate and institutional investors seeking exposure to future-defining technologies with resilient market positioning.

## Beyond Capital

### ECBF's stewardship model unlocks value in venture investments

ECBF is committed to active ownership as a strategic approach. As growth-stage companies in the bioeconomy face high capital intensity, regulatory complexity and market fragmentation, ECBF actively engages with investees and industry stakeholders to optimize returns and accelerate the commercial success of biosolutions. From strengthening investee business models, governance and sustainability performance to supporting structural improvements in market conditions and regulatory frameworks, ECBF ultimately contributes to a more stable and scalable investment environment for sustainable businesses.

Unlike funds that focus primarily on short-term exits, ECBF's model is built on stewardship-driven value creation, leveraging deep sector expertise, governance influence and strategic networks to drive long-term business transformation. Rather than passive capital deployment, ECBF remains actively involved through board representation, close engagement with CEOs and founders and co-investor syndication, ensuring that portfolio companies meet both financial and sustainability objectives.

#### Investee engagement: Strengthening business resilience and performance

Bioeconomy sectors require not only capital but also specialized knowledge, access to regulatory frameworks and operational scale-up strategies. ECBF distinguishes itself by enhancing the resilience of portfolio companies via strategic engagement, employing a dual-layered intervention model that combines:

- 1. Pre-investment structuring:** ECBF integrates sector-specific risk assessments, comprehensive due diligence (including ESG and impact) and governance terms into its investment agreements, embedding financial discipline and sustainability metrics from the outset. This lays the groundwork for engaging on material issues and tracking impact-driven growth from day one.
- 2. Post-investment stewardship:** ECBF maintains direct involvement at the board level, if possible, assuming strategic advisory roles. ECBF guides activities from scaling and market positioning to organizational growth and capital structuring through industry expertise, strategic guidance, access to high-value networks and ESG and corporate governance expertise (Figure 4).

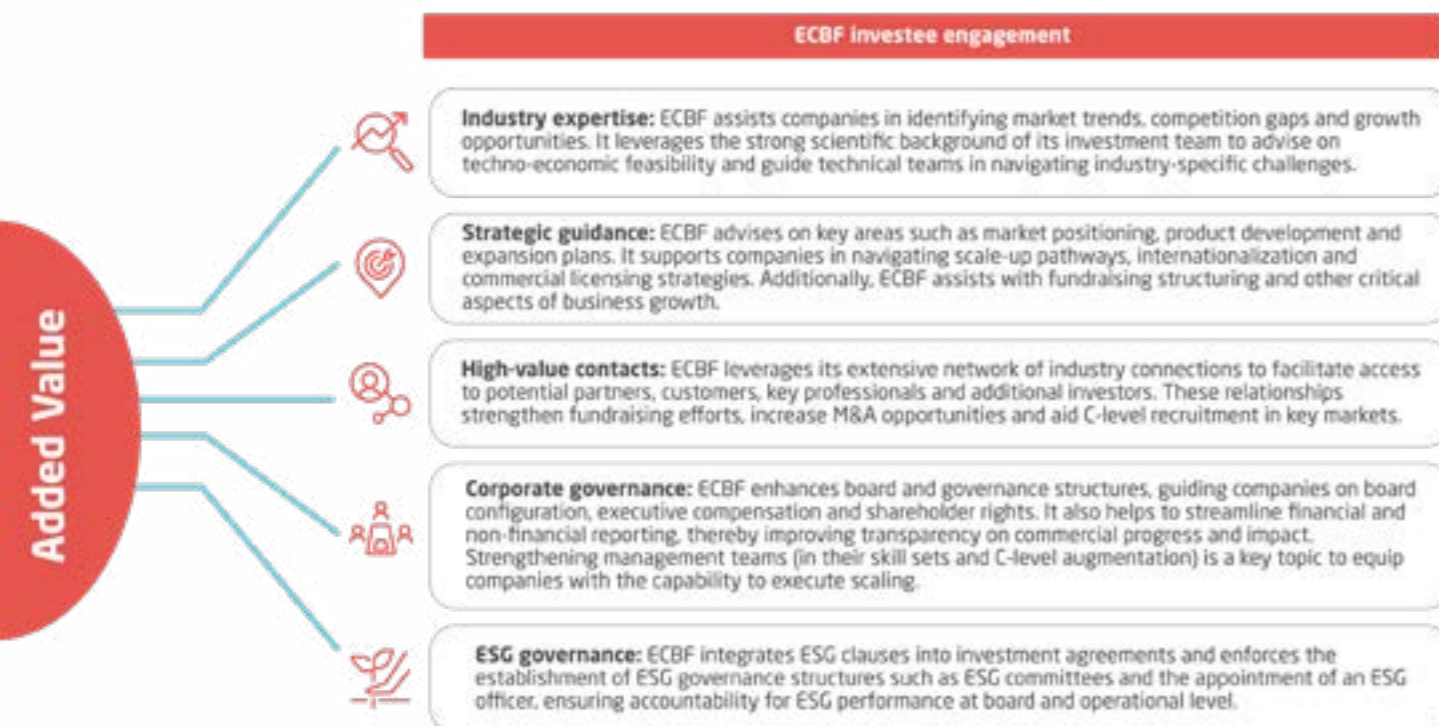


Figure 4: Added value through ECBF's direct engagement

### ESG and impact integration as value drivers and market advantages

ECBF integrates sustainability as a value-creation lever and a factor that enhances business resilience and market competitiveness. ESG risk and impact management is embedded at the investment thesis level, ensuring that portfolio companies align with climate change mitigation, EU sustainability regulations and investor-grade impact disclosures.

Key ESG and impact stewardship initiatives include:

- Embedding ESG clauses in investment agreements to ensure sustainable commitments.
- Requiring investees to establish ESG governance structures, including the appointment of dedicated ESG officers and committees.
- Guiding and advising investees to ensure compliance with regulatory and investor expectations.
- Monitoring ESG and impact key performance indicators (KPIs) related to climate impact, sustainable feedstock sourcing, resource efficiency and risk management.

By embedding ESG commitments into investment agreements, ECBF ensures that impact is factored into decision-making from the outset, mitigating exposure to regulatory risks, supply chain disruptions and reputational challenges.

#### Collaborative stewardship: Extending influence beyond the portfolio

Investors alone cannot transform industries—collaboration is critical. ECBF actively engages with investors, industry leaders, ecosystem players and policymakers to shape the structural enablers of sustainable capital flows and bioeconomy growth.

Through its formal and informal partnerships, ECBF influences industry standards, shares best practices and advocates for bio-based markets and ESG priorities.


To amplify its impact, ECBF collaborates with:

- **Venture capital and corporate investors** - Co-investing with like-minded funds to scale sustainable businesses and amplifying capital allocation to the bioeconomy.
- **Industry leaders** - Connecting innovators and industry players to accelerate sales, provide access to markets and scale up production.
- **Industry networks and associations** - Engaging in bioeconomy, VC industry and ESG-focused organizations to drive best practices and share growth-stage investor perspectives.
- **EU institutions, national agencies and stakeholders** - Advocating for frameworks that incentivize sustainable investment and contributing to improved investment conditions, regulatory clarity and a stronger market infrastructure for the European bioeconomy.
- **Impact investors and sustainability initiatives** - Aligning on climate action, circular economy principles and ESG disclosure standards as well as endorsing pledges and joining working groups on the sustainable transition.

Combining resources, knowledge and influence maximizes ECBF's reach, unlocking new opportunities that impact our business, investees and the broader venture capital and sustainable finance landscape.



# Scaling with Accountability



“In times of global geopolitical, environmental and societal uncertainty, ECBF provides clarity and confidence to sustainability-driven decision-making by leveraging rigorous, science-based impact metrics. Our investments create measurable value—accelerating the transition to a regenerative, circular bioeconomy through transparency and accountability in compliance with Article 9.”

Tobias Schomerus, ESG Analyst



## ESG Monitoring and Impact Reporting

### ECBF's data- and science-driven approach to sustainability

As an Article 9 fund, under the Sustainable Finance Disclosure Regulation (SFDR), ECBF integrates ESG and impact reporting as a fundamental pillar of its investment strategy. To ensure contributions to climate change mitigation, all invested companies must demonstrate reduced greenhouse gas (GHG) emissions compared with conventional market solutions. Beyond this impact factor, which relies on primary data and external verification, ECBF addresses ESG factors as key drivers of risk mitigation, value creation and investor alignment. By integrating ESG and impact considerations at every stage of the investment life cycle, the fund ensures accountability, enhances portfolio resilience and upholds its fiduciary duty to limited partners (LPs).

Over the years, ECBF has continuously refined its ESG and impact framework, evolving from initial alignment with European Investment Bank (EIB) standards to incorporating the more rigorous SFDR Level I and II disclosure requirements. This proactive approach not only ensures regulatory adherence but also strengthens transparency and verifiability, enhances due diligence and optimizes portfolio monitoring. As the ESG landscape evolves, ECBF remains at the forefront, adapting methodologies and deploying the highest standards of sustainable investment and ESG reporting grounded in practical, high-impact application.

#### ESG integration across the investment cycle

From the outset, ESG integration is embedded into ECBF's investment process, ensuring that environmental and social impact considerations are rigorously assessed. This involves:

- Screening companies based on their demonstrated positive environmental contributions.
- Validating ESG materiality assumptions to prioritize key risks and opportunities.
- Embedding ESG factors into investment decision-making and ongoing portfolio oversight.
- Actively supporting portfolio companies in ESG-related strategy development and execution.

Through this structured approach—underpinned by rigorous monitoring, active ownership and transparent reporting—ECBF aligns financial performance with sustainability imperatives, keeping LPs informed on portfolio ESG performance while fostering long-term value creation.

#### ESG reporting: Structured, strategic and scalable

Venture capital ESG reporting presents unique challenges, particularly due to the diverse reporting requirements of institutional investors, regulators and industry standards. Additionally, startup companies often lack the resources and capabilities to satisfy complex ESG data requests. ECBF addresses this challenge by adapting its reporting expectations to portfolio maturity levels, providing tailored support to each portfolio company and collaborating closely with co-investors to ensure that reporting remains both rigorous and manageable.

In accordance with annual disclosure obligations and LP expectations, ECBF tracks over 120 ESG key performance indicators (KPIs) across three core categories (Figure 5):

##### A. Climate change mitigation

Investments must demonstrate a measurable evidence-based contribution to climate change mitigation as a prerequisite for investment eligibility and allocation. Impact claims and greenhouse gas (GHG) reductions are monitored and reassessed annually to ensure alignment with ECBF's sustainability targets.

##### B. Do No Significant Harm (DNSH)

Investments must not significantly harm any other environmental or social objectives.

- **Minimum social safeguards** are SFDR-defined indicators to ensure alignment with minimum governance and social standards, including human and labour rights. Applicable frameworks include OECD Guidelines and the UN Guiding Principles on Business and Human Rights (UNGP).
- **Principle adverse impacts (PAIs)** are SFDR-defined metrics that assess the negative environmental and social impacts of financial activities. Portfolio companies are required to verify their compliance annually.
- **Climate risk assessment** is a probability-adjusted impact assessment of chronic and acute climate risks, as well as transition risks. ECBF integrates these findings into its financial modelling. Portfolio companies conduct annual climate risk assessments to ensure proactive mitigation strategies.

#### C. Expanded ESG KPIs

Qualitative and quantitative ESG data—outside of the SFDR-mandated set—include metrics such as energy consumption, environmental management systems and governance policies. Data validation, including document-based verification, enhances credibility and reliability.

After collection, all ESG data undergo a comprehensive review and verification process before being consolidated into ECBF's ESG Report for LPs. Active ownership via board participation and direct engagement ensures that portfolio companies remain in compliance with both regulatory requirements and ECBF's sustainability principles throughout the year (and investment cycle).

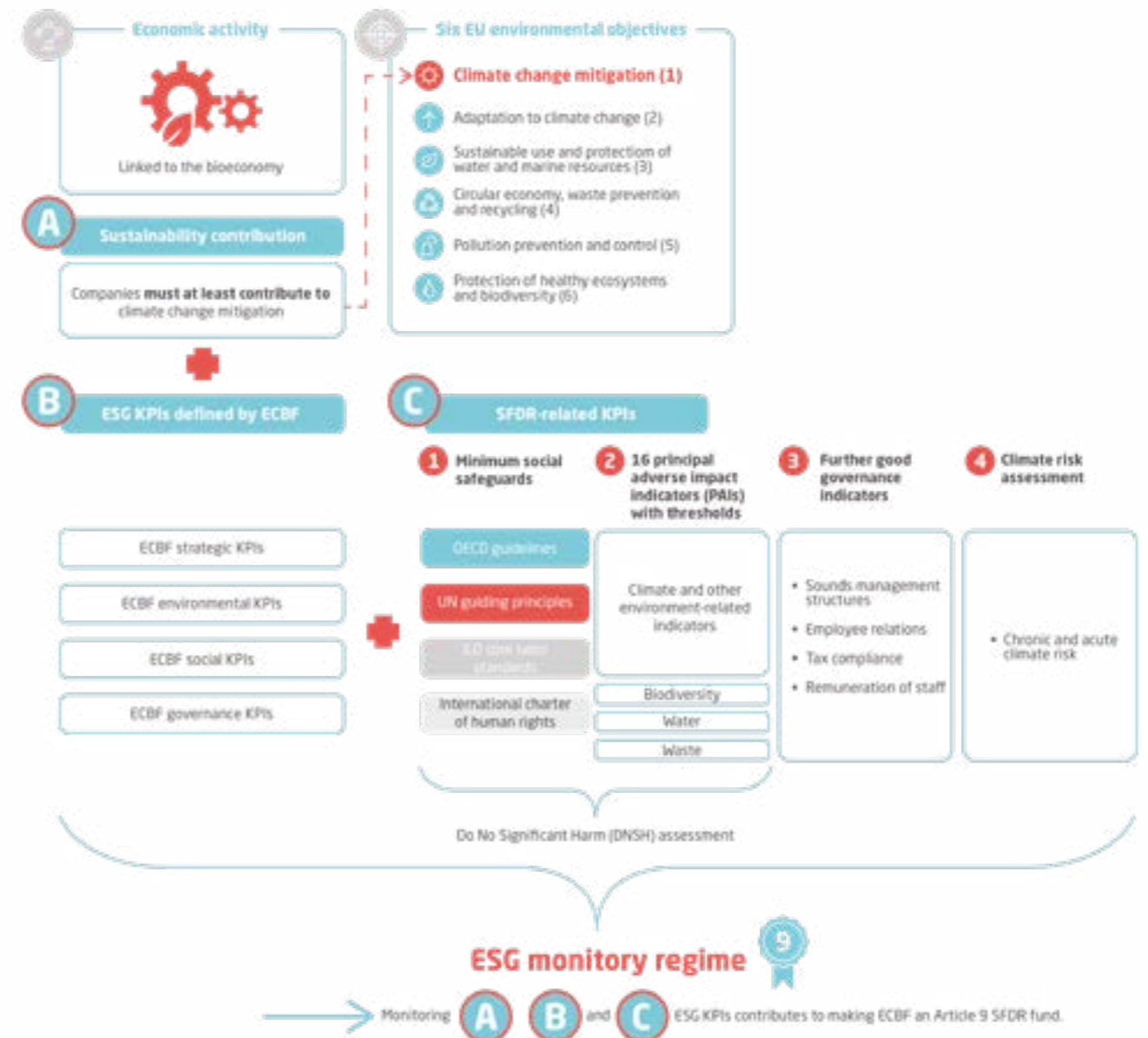


Figure 5: ECBF ESG monitoring framework

## Digitalizing Accountability

### ECBF's digitalized ESG and impact data collection infrastructure

As ECBF's portfolio continued to expand, the need for a scalable, digital-first ESG and impact data management and reporting solution became increasingly clear. In 2024, ECBF partnered with Apiday, a leading ESG and impact reporting platform designed to streamline data collection, enhance automation, ensure data accuracy and enable real-time collaboration between investors and investees.

Following a rigorous vendor selection process, 11 providers were assessed across 30+ weighted technical, financial and functional criteria. For ECBF, a next-generation digital ESG management platform must enhance its ability to collect, verify and report ESG and impact data, replacing survey tools and spreadsheets with a unified, auditable system.

ECBF benefits from:

- Data verification at portfolio level and the early detection of risks and engagement opportunities.
- Seamless ESG data aggregation across the portfolio for decision-making and stewardship.
- Streamlined reporting (faster, validated disclosures) to LPs and regulatory bodies.
- Real-time benchmarking to enhance portfolio-wide sustainability insights.

Portfolio companies benefit from:

- A streamlined and intuitive interface to manage their ESG performance.
- A tool to conduct double materiality analyses and corporate carbon footprint assessments and align scale-ups with the Corporate Sustainability Reporting Directive (CSRD) for a later stage.
- The development of a structured ESG roadmap in collaboration with their investors.

#### Enabling active stewardship

For ECBF, digitalizing accountability was a natural progression towards maximizing reporting efficiency while fostering deeper engagement with portfolio companies on sustainability best practices. In particular, digital collaborative tools and knowledge sharing allow investees to achieve continuous ESG improvement. As well as enabling direct engagement with investees, an ESG data management platform designed to meet the specific needs of venture capital and private equity firms facilitates seamless collaborative stewardship to enhance engagement outcomes within a company, sector or ESG topic.

#### Impact and insights

As a result of integrating Apiday's digital capabilities into its ESG infrastructure, ECBF has strengthened its already robust ESG monitoring framework and further solidified its position as a trusted, sustainability-driven venture capital fund in Europe. Key insights into the ESG performance of ECBF's portfolio are presented in Figure 6.

On average, technologies developed and marketed by ECBF portfolio companies produced approximately 46% fewer GHG emissions than their conventional market counterparts. This outcome underscores ECBF's commitment to climate change mitigation. As ECBF's monitoring extends beyond conventional standards, the fund can also track progress on KPIs related to factors such as resource sourcing, the management and optimization of resources, workforce wellbeing, safety and diversification, good governance and management systems, among others (Figure 6).

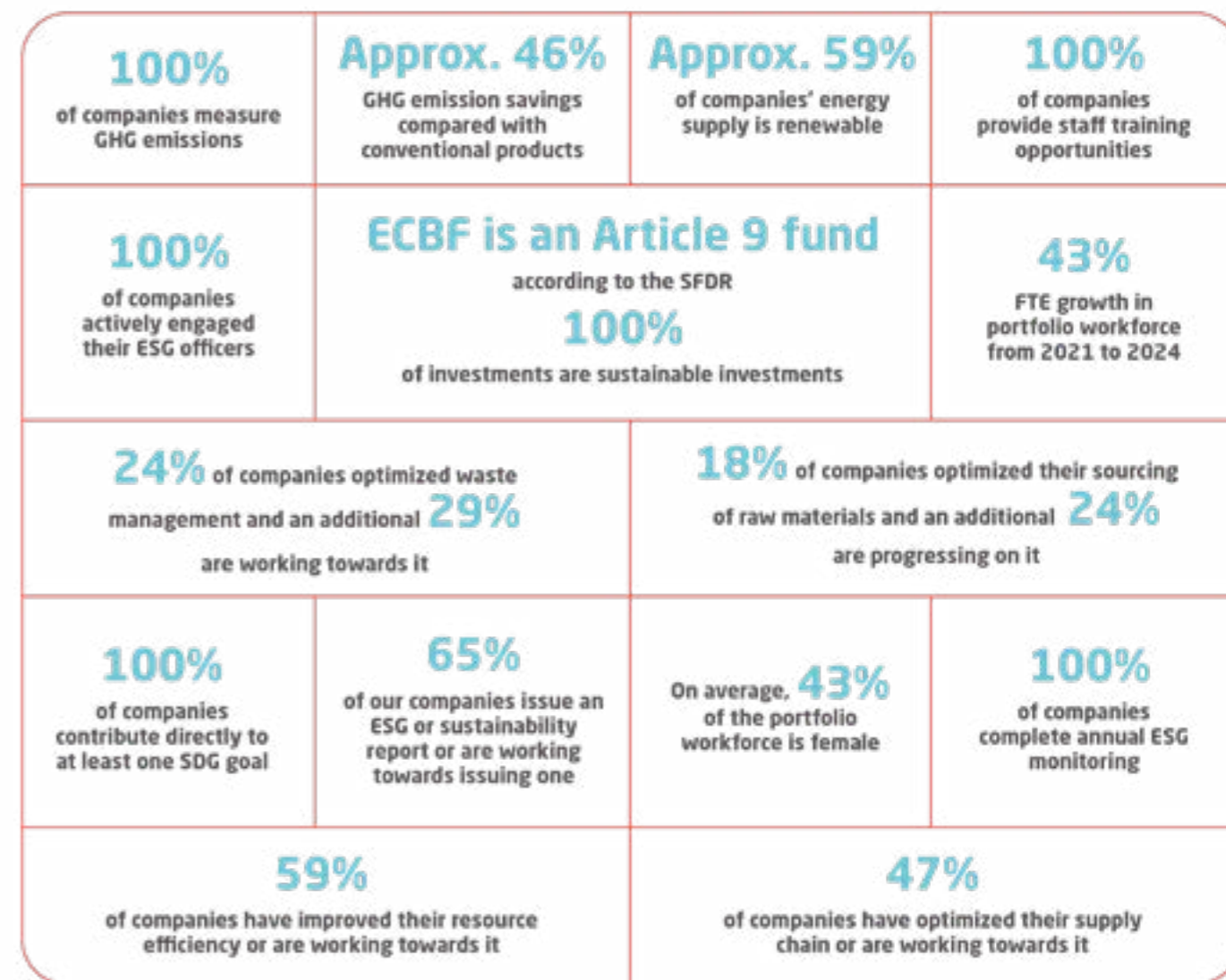


Figure 6: Selected ESG data of ECBF's portfolio

ECBF applies a uniquely rigorous, evidence-based approach as part of its ESG due diligence process. The fund gathers information directly from its investment targets, setting ECBF apart from other funds that rely on secondary data and benchmarks against aggregated external datasets or industry benchmarks. This approach enables a precise and transparent assessment of environmental impact that not only minimizes sustainability risks but also fosters innovation in the bioeconomy, enabling market opportunities for sustainable solutions that mitigate climate change and regenerate natural ecosystems.

As a proactive measure in its ownership strategy, ECBF requires each portfolio company to appoint a dedicated ESG officer and actively engages them through regular ESG officer meetings. These sessions foster peer learning, elevate ESG practices and promote transparent disclosure. Enhanced with the digital platform insights, ECBF aims to drive continuous performance improvement and accountability across the portfolio. By exit, companies are expected to demonstrate stronger ESG credentials but also a more competitive and resilient investment profile—ultimately enhancing value creation for both the companies and ECBF's limited partners.

## Biodiversity

### Current consideration in ECBF investment decisions

**As sustainability becomes central to long-term value creation for investors, biodiversity is a critical factor for securing resilient growth.** Healthy ecosystems provide essential services—pollination, water filtration, soil fertility and climate regulation—that underpin stable supply chains and sustainable growth of the markets where ECBF operates. Sectors like agriculture, food and biomaterials benefit from biodiversity-rich systems which support their productivity and innovation while offering superior carbon sequestration, effectively mitigating climate change.

For ECBF, investing in companies that integrate biodiversity considerations means gaining access to more resilient, future-proof business models with strong sustainability credentials that are better positioned to meet the growing demand for nature-positive solutions. Currently, ECBF has an evidence-based approach when it comes to the traceability and sustainability of biomass used as feedstock. This approach should ensure sustainable and reliable sourcing, thereby limiting environmental impact and making supply more resilient.

#### Screening: Excluding economic activities that harm biodiversity

With regard to biodiversity, the ECBF screening process entails strict exclusions and restrictions on its investments such as:

- The production or trade in wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species or Wild Fauna and Flora (CITES)
- The destruction of critical habitats
- The use and breeding of live animals which are not in compliance with EU legislation (Directive 2010/63 EU) as well as any business that applies cruel treatment to animals
- Commercial concessions over and logging of tropical natural forest; conversion of natural forest into a plantation
- New palm oil plantations.

Even when an investment aligns with the fund’s mission and meets the exclusion and restriction criteria, ECBF goes one step further by thoroughly evaluating additional biodiversity-related factors, reinforcing the fund’s commitment to sustainability.

#### Due diligence: Preventing impact on biodiversity loss drivers

- **Prevention of land use change**  
ECBF proactively assesses land use changes in regions where biomass is sourced by investment targets as this factor is a significant contributor to biodiversity loss. ECBF requests evidence-based information directly from investment targets to prove that the company does not procure its feedstock from production carried out on agricultural land that has been the subject of land use change from forest or pasture since 1994.
- **Traceability of biomass sourcing**  
ECBF ensures full traceability of biomass sourcing by requiring a chain of custody system for investment targets, supported by the relevant certifications to trace raw materials and intermediate products to their origin. Projects financed by ECBF should demonstrate that the biomass used meets recognized sustainability standards, such as RED+ and RED2+ defined by the European Commission (Directive 2009/28/EC). Companies that use biomass from food and biomaterials must demonstrate a robust audit system for tracking feedstock origins, while those that use wood and forest biomass must ensure that the origin of timber and products is documented, verifiable and compliant with the EU Timber Regulation (EU/995/2010) and EU Forest Law Enforcement, Governance and Trade (FLEGT) framework. Additionally, ECBF assesses alignment with the Forest Stewardship Council (FSC) and the Program for the Endorsement of Forest Certification (PEFC) standards.

### Post-investment: Guarantee ‘Do No Significant Harm’ to biodiversity

- **Principle adverse indicators (PAI)**  
As an Article 9 fund according to the SFDR, ECBF assess PAI as instrumental part of the ‘Do No Significant Harm’ (DNSH) analysis. ECBF measures the proportion of investments in assets situated within or adversely impacting biodiversity-sensitive regions, such as protected habitats or areas of high conservation value, requiring companies to disclose how their activities may contribute to habitat loss, deforestation or degradation.
- **Biodiversity dependencies and impacts**  
ECBF seeks disclosures from investees on their biodiversity dependency and efforts to restore or preserve habitats. It also encourages investees to collaborate with environmental organizations on this regard. For selected projects, ECBF requires environmental impact assessments (EIAs) evaluating both direct and indirect impacts on fauna, flora, soil, climate and landscapes.

ECBF employs a unique, evidence-based approach to ESG due diligence, ensuring its investments uphold the highest environmental standards. This methodology should ensure that investments do not affect biodiversity-sensitive areas, and that biomass is not sourced from agricultural land altered by land-use changes. A fully traceable biomass feedstock supply chain further ensures ECBF’s activities do not contribute to habitat destruction, deforestation, or ecosystem degradation.

ECBF recognizes the important linkages between bio-solutions and the drivers of biodiversity loss and is exploring quantitative assessment methodologies for integration into future investment decision-making. This connection represents a promising opportunity to further enhance impact and unlock new avenues for value creation within the portfolio (Figure 7). For ECBF, companies that mitigate biodiversity loss may benefit from strategic advantages: some may generate new business and access preferred financing.

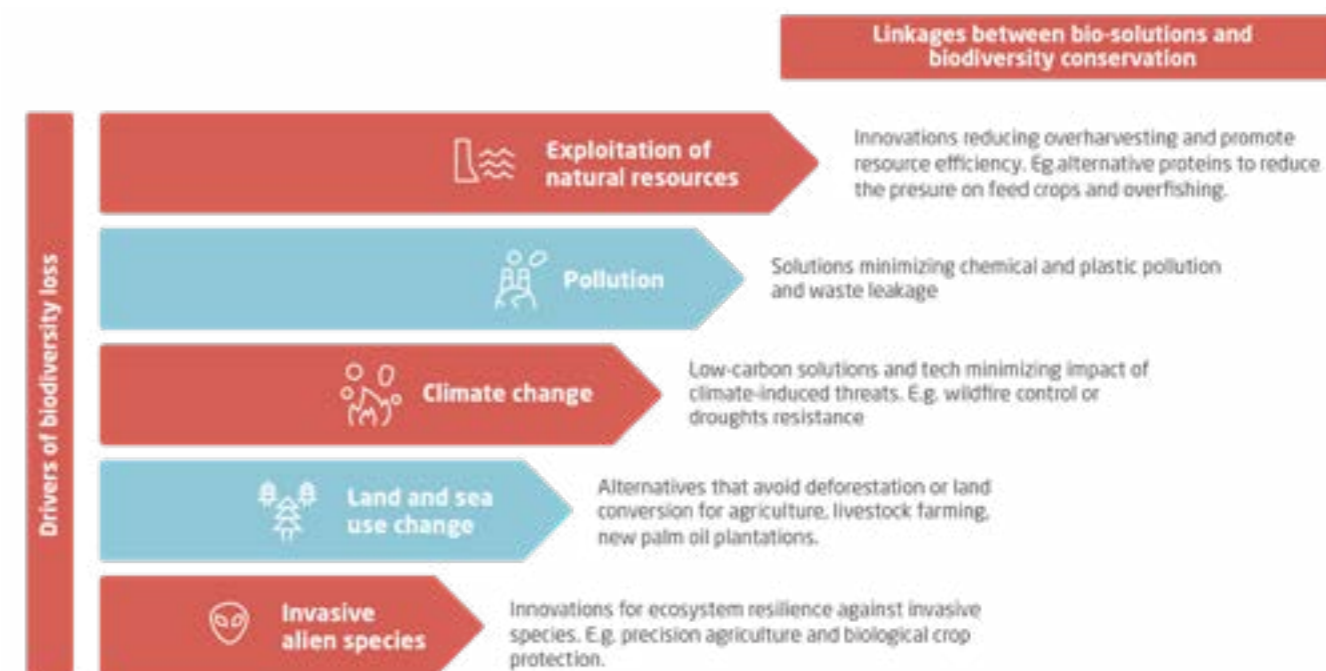


Figure 7: Potential investment opportunities addressing biodiversity loss



# Strengthening Resilience



“The world economy needs solutions to become more resilient to a shifting ecosystem and changing geopolitical landscape. It is crucial to foster predictability, ensure the stability of production processes and reduce vulnerability to disruptions. ECBF’s investees help their customers to increase their independence from market fluctuations in a sustainable manner.”

Cornelia Frentz, Director Governance and Sustainable Investing

## Resilient Businesses

### Managing environmental risks strengthens business resilience

ECBF promotes resilience at both macroeconomic and business levels by investing in ventures that are leading the transition from a fossil-based to a circular and bio-based economy. These companies offer sustainable alternatives with more resilient value chains than their conventional counterparts. Many of them upcycle or valorize side streams or rely on renewable, locally sourced feedstocks, making them and their business partners less vulnerable to supply chain disruptions triggered by political factors, climate events or biodiversity loss.

When scaled up, ECBF's portfolio companies can play a significant role in making downstream industries and stakeholders more resilient to adverse impacts in the supply chain.

### Climate change and biodiversity loss negatively impact economic success

Profitability and resilience at the economic and individual company level—both in Europe and beyond—are increasingly intertwined with the effects of climate change and biodiversity loss.

Climate change influences industries directly through damage due to the materialization of physical risks<sup>8</sup> (e.g. extreme weather at operational sites) and indirectly through transitional developments, e.g. policy shifts or regulatory changes. Scientific studies estimate climate damage at EUR 35 trillion annually, which equates to a 1.9% loss of income worldwide<sup>9</sup>. In recent years, the frequency and intensity of droughts, floods, storms, heatwaves, and food and water insecurity have caused significant economic disruption. These climate change-induced events lead to rising food and raw material prices, production and manufacturing downtime, and increased insurance premiums.

Along with various forms of direct human intervention, particularly economic activity, climate change affects the state of biodiversity, which refers to the variety of life on Earth. Biodiversity is of essential importance to businesses, providing ecosystem services (like clean air, water and fertile soil), raw materials and more. Biodiversity-related risks may be physical risks that can disrupt the value chain. They also may represent transition risks as governments develop stricter protective regulations. Biodiversity risks are closely interlinked with climate change. One example of this is the disruption of plant blooming and pollination cycles, which jeopardizes the survival of both plant and pollinator species, ultimately threatening crop yields and agri-food industries.

Examples of human-induced biodiversity deterioration include the deforestation of rainforests for agriculture or livestock farming, as well as soil degradation caused by monoculture farming and the excessive use of pesticides. Monitored species populations have declined on average by 69% since 1970, putting future economies, health and well-being at great risk. According to the World Economic Forum, USD 10 trillion in business value is at risk over the next decade due to biodiversity loss<sup>10</sup>.

Our economy needs solutions to become more resilient to a shifting ecosystem. It is crucial to strengthen the resilience of the economic system and businesses. For companies, it is essential to increase predictability, ensure the stability of production processes and reduce vulnerability to disruptions. A stable supply chain and consistent costs are essential to ensuring sustainable productivity.

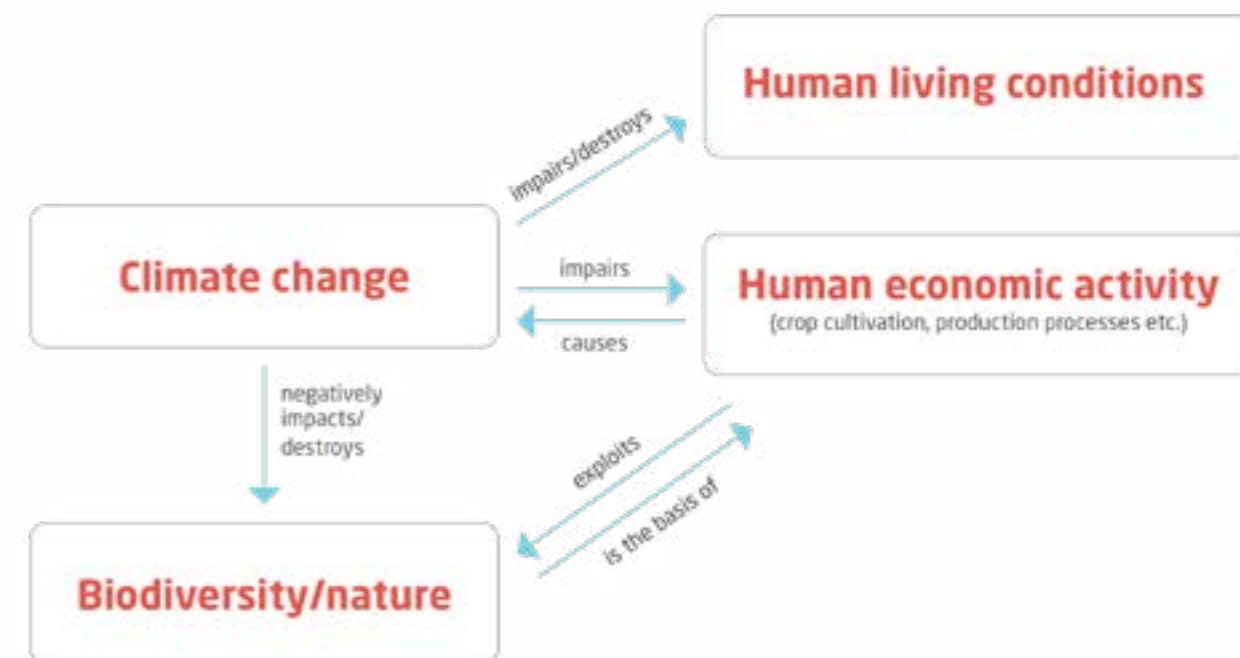


Figure 8: Interaction between biodiversity, climate change and human activity

### Environmental degradation in Europe

Due to global interdependence, local climate and biodiversity-related events have international effects. Examples include the depletion of natural resources, such as timber and fish stocks, caused by factors like droughts and fluctuations in water temperature leading to forest dieback and fish kills or migration. These conditions result in supply shortages and delays, ultimately disrupting supply chains.

We see numerous examples of climate and biodiversity damage at the European level every year. In Germany, the production of crops, such as winter wheat, is declining at a double-digit rate annually due to the changing climate<sup>11</sup>. In the last few years, at least 40% of Spain's territory has experienced severe drought, impacting 80% of its farmlands<sup>12</sup>. In October 2024, devastating floods in the country's Valencia and Murcia regions led to extensive economic and human losses. The damage amounted to some EUR 22 billion<sup>13</sup>.

### Portfolio's positive impact on climate and biodiversity

ECBF's current primary environmental objective is to leverage business opportunities that contribute to climate change mitigation and adaptation. For instance, Elicit Plant<sup>14</sup> develops biologicals to enhance drought resistance in crops while Weenat<sup>15</sup> supplies technologies that optimise field irrigation efficiency. In addition, several of ECBF's investees are likely to have a positive impact on biodiversity. For example, some technologies enable reductions of up to 70% in pesticide use, minimizing harm to non-target species—including beneficial insects, birds, aquatic life and soil organisms—and safeguarding critical ecosystem functions, such as pollination and soil health.

**Through these investments, ECBF is strengthening the resilience of ecosystems against biodiversity and climate-related risks while also enhancing the productivity of the agri-food sector and the biomaterials industry.**

### Refining biodiversity integration and measurable impact

Measuring the impact of human activity on biodiversity and the resulting consequences for business remains challenging. Nonetheless, ECBF's ESG team is currently running a pilot project to explore science-based methods for quantifying the portfolio's contribution to biodiversity. The goal is to develop a broadly applicable framework and quantitative assessment methodology for integration into future investment decision-making. ECBF aims to identify investments with significant potential to reduce biodiversity pressures and enhance benefits.

A photograph of laboratory glassware including a large Erlenmeyer flask with blue liquid, a graduated cylinder with orange liquid, and another Erlenmeyer flask with blue liquid. Green plants are placed in the foreground and background, creating a scientific and natural theme.

# A Portfolio with Impact

## **AmphiStar B.V.**

AmphiStar produces the market's first fully circular (fully waste-based) and novel biosurfactants, providing more sustainable alternatives for the current chemically produced and bio-based surfactants.

## **Aphea.Bio NV**

Aphea.Bio develops biostimulants and biocontrol products from the natural plant microbiome, reducing fertilizer application in crops and helping to control fungal diseases in maize and wheat sustainably.

## **Biosyntia ApS**

Biosyntia uses cutting-edge biotechnology and proprietary R&D tools to deliver nature's ingredients at scale. It develops first-of-its-kind precision fermentation processes replacing fossil-based alternatives.

## **EFOS d.o.o. (Trapview)**

Trapview is the world's most advanced platform for plant protection providing a real-time pest situation overview, forecasting future pest situations and simulating different plant protection scenarios.

## **Elicit SAS**

Elicit Plant offers hydric stress management solutions to farmers based on plant-derived molecules, embracing the shift towards greener agriculture.

## **Heura (Foods for Tomorrow, S.L.)**

HEURA develops high-quality plant-based protein products without compromising on taste, texture or nutrition, offering more sustainable foods—clean-label, nutritionally superior and affordable.

## **In Ovo B.V.**

In Ovo develops and sells high-throughput screening technology that scans chicken eggs in order to end the mass culling of male chicks in the poultry industry.

## **MOGU S.R.L. (Sqim)**

Mogu uses fungal-based technologies to create high-quality materials while fostering a responsible relationship with the environment.

## **Nuritas Ltd.**

Nuritas develops sustainable plant-based food ingredients and consumer products based on natural bioactive peptides unlocked by its proprietary AI platform.

## **OroraTech GmbH**

OroraTech specializes in space-based thermal intelligence, offering satellite-powered wildfire early detection and real-time monitoring solutions that mitigate human-induced climate threats.

## **Paptic Ltd.**

Paptic has developed a fibre-based and recyclable material as a drop-in and sustainable alternative to plastic films in various flexible packaging applications.

## **PeelPioneers B.V.**

PeelPioneers' proprietary pioneering technology processes orange peel (that would otherwise be incinerated) into functional ingredients for the food industry.

## **Protix B.V.**

Protix has built the world's first industrial insect facility, developing insect ingredients for animal feed and laying the foundation for a wide range of certified applications in the feed and food industry.

## **Red Horticulture SAS**

Red Horticulture offers photobiological LED lighting solutions for greenhouses, resulting in higher yields, faster crop development and improved product quality while reducing energy consumption.

## **Reduced ApS**

REDUCED produces savoury flavour solutions for the food service and food ingredient industries, creating a second life cycle for organic side streams.

## **watttron GmbH**

watttron develops innovative digital thermoforming and sealing technology to increase recyclability in the packaging industry, driving efficiency, material savings and sustainability.

## **Weenat S.A.S.**

Weenat develops a precision irrigation technology and advanced agro-weather solutions, enabling farmers to optimize water consumption, enhance crop yields and improve soil health.



# Amphistar

Advancing the circular bioeconomy with next-generation biosurfactants.

## About

Amphistar is transforming the surfactant industry with high-purity biosurfactants derived from second-generation (2G) feedstocks, reducing reliance on fossil-based chemicals.

As essential components in cleaning, emulsification and foaming, surfactants are critical to numerous industrial and consumer products.

Amphistar's patented waste-to-value technology enables the first fully circular biosurfactant production, transforming waste into high-performance, biodegradable alternatives. By developing advanced production strains and bioprocessing techniques that enhance yield, purity and functionality, Amphistar is setting a new standard for sustainable and scalable surfactant solutions.

## Related UN SDGs\*



**9.4** Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes



**12.a** Strengthen scientific and technological capacity to move towards more sustainable patterns of consumption and production



**13.2** Operationalize an integrated plan that fosters low GHG

## ESG key figures

**80%**

GHG emissions avoided/reduced

**6-10x**

lower GHG emissions compared with palm- derived biosurfactants

**7x**

lower land use than a non-upcycled sophorolipid equivalent

## Positive impact

### Sustainability problem

The global surfactant industry produces over 18 million tons annually that rely on fossil-based sources and are discharged into water systems, causing potential harm to the environment [1].

Surfactants are the basis for almost all cleaning products available and are essential components in detergents, cosmetics, and pharmaceuticals. Conventional surfactants, produced from petrochemicals and palm oil, release significant amounts of CO2 and wastewater contaminants, exacerbating climate change and ecosystem damage. Alarmingly, up to 60% of surfactants escape into the environment due to incomplete wastewater treatment, where they can foam in waterways, degrade into toxic by-products and harm aquatic life and drinking water sources [2].

While the reliance on palm oil-based surfactants drives deforestation, biodiversity loss, and social land-use conflicts in tropical regions, synthetic surfactants persist in the environment, leading to bioaccumulation and toxicity concerns, especially in aquatic ecosystems. Despite efforts to transition to first-generation (1G) biosurfactants, which use glucose as a feedstock, these solutions still rely on agricultural inputs that compete with food production. This not only perpetuates land-use pressures but also limits their overall environmental benefit.

As regulatory pressure mounts —e.g. the EU's sustainability targets for detergents and personal care products— brands and manufacturers are increasingly adopting green chemistry principles and bio-based alternatives that reduce environmental impact without compromising performance.

### Sustainability solution

Amphistar is transforming the chemical industry by replacing fossil-based and palm-derived surfactants with biosurfactants sourced from waste streams, offering a scalable and high-impact alternative.

By leveraging microbial fermentation, Amphistar efficiently converts food waste, industrial residues and used oils into high-purity biosurfactants, eliminating reliance on virgin agricultural feedstocks and non-renewable resources. This process reduces carbon emissions, land use, deforestation and water consumption while operating under mild conditions, requiring less energy and generating minimal waste. The result is a high-yield, low-footprint alternative to conventional surfactants, enabling industries to transition to clean-label, biodegradable ingredients without compromising performance.

With over 25 biosurfactant variants, Amphistar delivers tailored formulations for personal care, household cleaning and industrial applications. These biosurfactants offer superior foaming, emulsifying and cleaning properties while maintaining full biodegradability and non-toxicity, ensuring a seamless replacement for traditional surfactants away from harmful formulations.

To meet rising market demand, Amphistar is scaling production with an upcoming 2,000-ton facility, paving the way for widespread industrial adoption of eco-friendly surfactants and a cleaner, more sustainable future.

## Company facts

### PRODUCT & TECHNOLOGY

Resource-efficient fermentation-based high-purity biosurfactants

### USP

Sustainable, high-performance biosurfactants from second-generation feedstocks

### NUMBER OF EMPLOYEES & DIVERSITY

13+ FTEs, of which 62% are female employees

**AmphiStar**  
BIOSURFACTANTS

COMPANY **Amphistar B.V.**

HEADQUARTERS **Belgium**

MARKET **Home and personal care**

CEO **Pierre-Franck Valentin**

WEBSITE **www.amphistar.com**

\*SDGs are illustrative and not externally verified.

[1] Mordor Intelligence (2025). Surfactants Market Size - Industry Report on Share, Growth Trends & Forecasts Analysis (2025 - 2030). Retrieved from [here](#).

[2] Chong, J., et al. (2019). Ecosystem impacts of phosphorus and surfactants in consumer products. Institute for Sustainable Futures, University of Technology Sydney for Stewart Investors. Retrieved from [here](#).

[3] EUR-Lex (2025). Regulation (EU) 2025/40 on packaging and packaging waste. Retrieved from [here](#).



# Aphea.Bio

## Cutting-edge biotechnology driving the revolution in biologicals and redefining sustainable agriculture

### About

**Aphea.Bio is a leading player in the development of the next-generation of agricultural biological products based on naturally occurring microorganisms.**

Aphea.Bio focuses on microbial strains that improve plant nutrient uptake (biostimulants) and protect crops against disease (biocontrol). Their mission is to reduce fertilizer and pesticide use while providing innovative and sustainable solutions for agriculture, especially large acre crops like maize and wheat.

Aphea.Bio is a Certified B Corporation, reflecting the commitment to meet high social and environmental impact, accountability and transparency.

### ESG key figures

**15%**

GHG emissions avoided/reduced

**50%**

less pesticides required

**20%**

less fertilizer required

### Related UN SDGs\*



**2.4** Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production and help maintain ecosystems



**12.2** Achieve the sustainable management and efficient use of natural resources (material footprint)



**13.2.1** Operationalize of an integrated plan that foster low GHG without threatening food production

\*SDGs are illustrative and not externally verified.

### Positive impact

#### Sustainability problem

Today's global agri-food landscape presents significant challenges. Around 350,000 tons of pesticides and 11.2 million tons of mineral fertilizers are sold in Europe annually to protect crops from pests and diseases and to increase crop yields amidst population growth [1].

Industrial agriculture has created a system dependent on the extensive use of chemical pesticides and large quantities of nitrogen- and phosphorus-based fertilizers that exacerbates environmental pollution, adversely affecting water quality and marine biodiversity with persistence and toxic effects on non-target species.

Nitrogen pollution alone imposes a substantial economic burden on the EU, costing between EUR 70 billion and EUR 320 billion per year[2]. Furthermore, the production of ammonia and fertilizers contributes between 1 and 2% of worldwide GHG emissions and global energy consumption estimated on 1 to 2 % of primary energy use [3].

These environmental impacts also pose risks to human health through drinking water contamination (e.g. methemoglobinemia).

#### Sustainability solution

**Aphea.Bio's products minimize chemical pesticide and fertilizer use and risk, while boosting crop yield and regenerative agricultural practices.**

Through innovative biostimulant and biocontrol products based on microbials, Aphea.Bio enables increased food production on less land, with fewer inputs and safer products, fostering sustainability. Aphea.Bio's biostimulant products optimize nutrient uptake, cutting fertilizer use by 20%. They stimulate root growth and vigor, enhance water uptake and bolster soil disease resistance. The demonstrated 3-5% yield increase in wheat and maize underscores the potential of these products to sustain food security while mitigating environmental pollution. On the other hand, Aphea.Bio's biofungicide products effectively and naturally combat major fungal foliar and soil diseases in cereals, fruits and vegetables.

Reducing synthetic fertilizer use limits direct nitrous oxide emissions from cultivated soils and mitigates GHG emissions associated with synthetic production. Additionally, diminished agricultural runoffs lessen groundwater pollution and reduce eutrophication in lakes and rivers caused by nitrate emissions. Lastly, alternative biologicals also benefit human health by reducing exposure to harmful chemicals for both farmers (spray) and consumers (residues on crops).

### Company facts

#### PRODUCT & TECHNOLOGY

Develops innovative biological products exploiting the untapped microbial space

#### USP

Advanced R&D and high-throughput technology for discovering active ingredients, surpassing industry standards in speed and efficiency

#### NUMBER OF EMPLOYEES & DIVERSITY

65.25 FTEs, of which 48% are female employees



COMPANY **Aphea.Bio NV**

HEADQUARTERS **Belgium**

MARKET **Agriculture**

CEO **Isabel Vercauteren**

WEBSITE **www.aphea.bio**

[1] Eurostat (2022). 346,000 tons of pesticides sold in 2020 in the EU. Retrieved from [here](#).

[2] European Commission (2022). Nutrients: Commission seeks views on better management. Retrieved from [here](#).

[3] International Energy Agency (IEA) (2021). Ammonia Technology Roadmap. Retrieved from [here](#).



# Biosyntia

## Pioneering sustainable natural ingredients for a healthier world

### About

**Biosyntia is an industrial biotech company delivering nature's ingredients at scale both affordably and sustainably.**

Using cutting-edge biotechnology and proprietary R&D tools and insights, Biosyntia is developing first-of-its-kind precision fermentation processes. Its vision is to develop natural and environmentally friendly production processes for essential nutritional active ingredients, reducing the use of petrochemical-based processes and driving a positive environmental impact.

Biosyntia focuses on a subset of natural products, including fermented vitamins and plant-derived bioactives.

### ESG key Figures

**48%**  
GHG emissions avoided/reduced

**47%**  
reduction potential SO<sub>2</sub> (terrestrial acidification)

**20%**  
reduction potential in water consumption

## Positive impact

### Sustainability problem

**As our global population approaches 9.7 billion by 2050, the demand for essential dietary ingredients is becoming increasingly crucial. However, this challenge is exacerbated by environmental implications stemming from traditional sourcing methods, such as crop or animal extraction, as well as petrochemical synthesis.**

The vast majority of B vitamins, such as B7 (biotin) and B1 (thiamine), are synthesized in China with a heavy use of toxic and polluting chemicals. Meanwhile, other bioactive compounds are conventionally derived from plant extraction processes, which also involve harsh chemicals.

Plant-based extracts suffer from a low and inconsistent quality, sometimes reaching as low as 0.5% purity. Moreover, there is a risk of harmful substances, such as pesticide and solvent residues, contaminating the final products. Additionally, the inefficient use of arable land contributes to a substantial environmental footprint associated with these plant-based extracts.

### Sustainability solution

**Using precision fermentation, Biosyntia pioneers the production of bioactives with a minimal environmental footprint compared fossil-based chemical synthesis.**

By employing microbial fermentation processes fueled by plant sugars, Biosyntia offers sustainable alternatives for generating select B vitamins and other bioactives with purity levels of up to 98%. This approach avoids the use of petrochemicals and harsh chemicals, resulting in a minimal environmental footprint and significant reductions in GHG emissions. Moreover, the precision fermentation process allows for local production, reducing dependency on feedstock from other countries and lowering transport emissions.

Biosyntia leverages its unique and proprietary microorganisms to efficiently produce specific natural ingredients with health benefits. For example, Biotin has proven to be an essential nutrient that is crucial to energy metabolism. Other bioactives in development show promise in reducing the risk of chronic diseases and supporting nervous system function.

### Related UN SDGs\*



**3.4** Reduce premature mortality from non-communicable diseases through prevention and promotion of well-being



**12.2** Achieve the sustainable management and efficient use of natural resources (material footprint)

**12.4** Achieve the environmentally sound management of chemicals and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment



**13.2.1** Operationalize of an integrated plan that foster low GHG without threatening food production

### Company facts

PRODUCT & TECHNOLOGY  
**Producer of natural active ingredients derived from a pioneering state-of-the-art biotechnology toolbox**

USP  
**Proprietary microbial fermentation processes to create natural ingredients**

NUMBER OF EMPLOYEES & DIVERSITY  
**13 FTEs, of which 27% are female employees**



COMPANY **Biosyntia ApS**  
HEADQUARTERS **Denmark**  
MARKET **food; personal care**  
CEO **Martin Plambech**  
WEBSITE **www.biosynthia.com**

\*SDGs are illustrative and not externally verified.

ESG key figures from BLONL, Biosyntia external LCA



# EFOS (Trapview)

## AI-powered crop protection: smart monitoring for sustainable fields and food security

### About

Trapview, developed by EFOS, is a game-changing solution that efficiently powers the plant protection decision-making process.

Trapview is the world's most advanced platform for pest insect monitoring and forecasting. Through its grid of automated insect traps coupled with advanced processing based on artificial intelligence, it offers real-time insights into pest population dynamics, forecasting the future pest situation and simulating different plant protection scenarios.

### ESG key figures

**21%**

GHG emissions avoided/reduced

**7.4 million tons**

of food produced with the aid of Trapview

**EUR 65.2 million**

of costs avoided for farmers

### Positive impact

#### Sustainability problem

In Europe, approximately 350,000 tons of pesticides are sold annually [1]. Pesticides play a vital role in agricultural production and food security by combating the pests responsible for 11 to 20 % of pre-harvest crop damage.

While crop protection products enhance the efficiency of agricultural inputs (e.g. fertilizer, irrigation, ploughing) by mitigating losses from diseases and pest infestation, their use poses environmental and health risks.

Pesticides can leach into the soil and water bodies, causing biodiversity loss and degradation of ecosystem services such as insect pollination, soil formation and composition and the provision of clean drinking water [2]. Residues in crops and animal feed pose health risks to humans and animals, including endocrine disruption, and can enter the food chain. In addition, the extensive use of pesticides contributes to the development of pesticide resistance.

Additionally, pesticide-related GHG emissions are released into the environment with variations depending on formulation, manufacturing and application. They account for 1 to 51% of agricultural emissions, with significant impacts observed in specific crops and regions such as apple production in Austria (51%), viticulture (37%), and sugar beet cultivation (12%) [3].

#### Sustainability solution

Trapview's automated traps provide real-time pest data to farmers, enabling targeted crop protection measures instead of spraying entire crops with pesticides preventively.

This approach minimizes unnecessary pesticide use by ensuring timely applications tailored to crop needs, resulting in higher yields, improved crop quality, lower business risks and a reduced environmental footprint. With a 5% yield increase with up to 50% less crop protection spray, Trapview boosts efficiency, lowers operational costs and mitigates exposure to harmful substances for soil, plants, animals and humans.

In addition, Trapview's technology enables the use of greener, more environmentally friendly products because the efficacy of the new biological products is sensitive to application timing and pest developmental stages.

Compared with conventional pest management, Trapview's digital solution reduces GHG emissions by minimizing transportation fuel consumption associated with mass spraying and constant field visits, lowering indirect emissions from insecticide production and use and minimizing land use requirements for equivalent yields. Indirectly, Trapview also reduces surface water contamination and pesticide concentration in groundwater.

### Related UN SDGs\*



**2.4** Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems and strengthen capacity for adaptation to climate change, extreme weather, drought and other disasters



**12.4** Achieve the environmentally sound management of chemicals and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment



**13.2.1** Operationalize of an integrated plan that foster low GHG without threatening food production

\*SDGs are illustrative and not externally verified.

### Company facts

#### PRODUCT & TECHNOLOGY

IT solutions integrated into automated electronic traps for crop protection

#### USP

World's largest database of pest data and predictive algorithms allowing advanced forecasting of 25 insect/pest species

#### NUMBER OF EMPLOYEES & DIVERSITY

49.1 FTEs, of which 40% are female employees



COMPANY **EFOS d.o.o.**

HEADQUARTERS **Slovenia**

MARKET **Agriculture**

CEO **Dejan Jančič**

WEBSITE **www.trapview.com**

[1] Eurostat (2022). 346,000 tons of pesticides sold in 2020 in the EU. Retrieved from [here](#).

[2] European Environmental Agency (2018). Pesticide Sales. Retrieved from [here](#).

[3] CropLife International (2012). The Carbon Footprint of Crop Protection Products. Retrieved from [here](#).

ESG key figures from Trapview's internal data system



# Elicit Plant

## Developing resilient agriculture to mitigate climate change risks

### About

Elicit Plant is a biotechnology company addressing the physiological resilience of crops through natural, high-performance solutions tailored to agricultural practices.

Elicit Plant's proprietary technology relies on an innovative plant-derived molecule that enhances plant metabolism, reducing water requirements, strengthening resistance to water stress and minimizing yield losses during water shortages. As the first company to validate this technology at a large scale in row crops such as maize, wheat and sunflowers, Elicit Plant has demonstrated significant advances in hydric stress management and in improving crop water use efficiency.

### ESG key figures

**18%**

GHG emissions avoided/reduced

**10%**

yield increase average (multiyear trial)

**10 to 20%**

reduction in water consumption

### Related UN SDGs\*



**2.4** Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems and strengthen capacity for adaptation to climate change, extreme weather, drought, and other disasters



**6.4** Increase water-use efficiency and ensure sustainable withdrawals and supply of freshwater to address water scarcity



**12.2** Achieve the sustainable management and efficient use of natural resources (material footprint)

\*SDGs are illustrative and not externally verified.

## Positive impact

### Sustainability problem

Drought has been a major cause of agricultural disaster in the last decade. Records indicate that, between 1980 and 2014, global wheat and maize yields declined by 21% and 40%, respectively, due to drought [1].

Hydric stress in plants arises when their water demand surpasses the available supply, stemming from factors like drought, altered rainfall patterns due to climate change and heightened competition for water resources from agriculture and industry. This stress profoundly impacts plant growth, productivity and survival, limiting crop and livestock growth, reducing yields and elevating food prices. The effects extend to food security, biodiversity and ecosystem preservation.

The trajectory of climate change heightens the risk of drought, intensifying frequency and severity in many regions. With rising temperatures and water deficits compounded by summer droughts, the imperative to invest in drought-resistant crops and technologies is becoming increasingly urgent.

The likelihood of megadroughts - droughts lasting ten years or more - is projected to increase from 12% today to more than 60% by 2050 [2].

### Sustainability solution

Elicit Plant's innovative use of phytosterols has resulted in a product that enhances crop resilience to water stress due to climate change and water scarcity.

Phytosterols are plant-derived molecules that effectively boost crop resilience by reducing water consumption by 10 to 20% through evapotranspiration and by stimulating root development. This effect enables crops to reach their full potential even in water-stressed conditions, as evidenced by the average yield increase of 10% using Elicit Plant's products (varies depending the local pedoclimatic conditions).

By limiting crop yield losses and safeguarding farmers' investments in land, particularly given escalating agricultural risks due to climate change, Elicit Plant's products play a crucial role in ensuring farm profitability and sustaining production to meet food needs.

This natural solution also offers opportunities for optimizing water use in irrigated systems, while at the same time preserving the ecosystem. In particular, the enhanced yield on less land contributes to reducing GHG emissions per kilogram of plant produced.

Elicit Plant's flagship product, BEST-a, gained broader EU approvals for cereals, sunflower, and soya applications, alongside earning the B Corp™ Certification in 2024, reinforcing its commitment to sustainable agriculture.

## Company facts

### PRODUCT & TECHNOLOGY

Develops hydric stress management solutions for row crops

### USP

Proprietary formulation enabling the use of phytosterols in agriculture at competitive prices

### NUMBER OF EMPLOYEES & DIVERSITY

67 FTEs , of which 45% are female employees



COMPANY **Elicit Plant SAS**

HEADQUARTERS **France**

MARKET **Agriculture**

CEO **Jean-François Déchant**

WEBSITE **www.elicit-plant.com**

[1] Daryanto, S., Wang, L. (2016). Global Synthesis of Drought Effects on Maize and Wheat Production. PLOS ONE 11(5): e0156362. Retrieved from [here](#).

[2] NASA Scientific Visualization Studio (2015). Megadroughts in U.S. West Projected to be Worst of the Millenium. Retrieved from [here](#).

ESG key figures based on Elicit Plant's field trials

# Heura

A technology-driven movement redefining the plant-based food industry.

## About

Heura is redefining the plant-based food industry with a mission-driven approach to clean-label, additive-free and nutritionally superior alternatives to meat and dairy.

Rooted in scientific research and food engineering, Heura's proprietary technology enables the development of sustainable, high-quality plant-based products without compromising on taste, texture or nutrition.

As a leader in Mediterranean-inspired food innovation, Heura is accelerating Europe's transition towards a net-positive food system. With operations in over 20 countries—including key markets like Spain, France, Italy and the UK—the company is rapidly scaling through international expansion, increased retail penetration and next-generation food technology.

## ESG key figures

**52%**

GHG emissions avoided/reduced

**23%**

decrease in overall corporate climate footprint (YoY)

**100%**

energy savings compared with LED

## Related UN SDGs\*



**12.2** Achieve sustainable management and efficient use of natural resources (material footprint)



**13.2.1** Operationalize of an integrated plan that fosters low GHG without threatening food production



**15.1** Ensure the conservation, restoration and sustainable use of terrestrial ecosystems and their services

\*SDGs are illustrative and not externally verified.

## Positive impact

### Sustainability problem

The global food industry is facing a triple crisis—climate change, food security and public health.

The meat and dairy industries account for 14.5% of global greenhouse gas emissions, with vast amounts of land, water and energy being used to sustain livestock production [1]. Additionally, the environmental cost of deforestation, biodiversity loss and soil degradation linked to industrial agriculture continues to rise, making conventional animal protein one of the most resource-intensive industries on the planet [2] [3].

Meanwhile, the plant-based food sector, despite its rapid growth, has been plagued by consumer concerns over highly processed products, long ingredient lists and artificial additives. Many existing plant-based alternatives rely on chemical stabilizers, artificial flavours, and preservatives, creating a perception of being unnatural. This disconnect between consumer expectations and product offerings has led to slower adoption rates in key markets [4].

In addition, price parity with animal-based products remains a major challenge. While plant-based foods have seen an increase in demand, their production costs remain higher than traditional meat and dairy, limiting their accessibility to a wider audience [5].

### Sustainability solution

Heura is tackling the triple sustainability challenge by setting new standards for plant-based foods – clean-label, nutritionally superior and affordable.

The company's patented protein structuring technology mimics the fibrous texture, taste and juiciness of traditional meat, creating plant-based alternatives that are nearly indistinguishable from their animal-based counterparts. This scientific advancement allows Heura to offer high-protein, fully plant-based alternatives that meet consumer expectations while maintaining clean-label transparency.

Beyond water conservation and saving thousands of animal lives, Heura's proprietary Good Rebel Tech has revolutionized food engineering with people's health in mind. By eliminating the need for artificial additives and chemical stabilizers, it ensures short, natural ingredient content.

To make sustainable eating more accessible, Heura is also advancing cost-efficient production methods aimed at achieving price parity with meat. Through innovative ingredient processing, upcycled plant materials and strategic supply chain management, the company is not only significantly reducing its carbon footprint and energy consumption but also its production costs.

By prioritizing markets with robust retail infrastructure and collaborating with leading food manufacturers, distributors and retailers, Heura is ensuring widespread accessibility—accelerating the transition to a more sustainable food system.

## Company facts

### PRODUCT & TECHNOLOGY

Proprietary Good Rebel Tech for the additive-free formulation of plant-based meat, cheese and deli products

### USP

Additive-free, clean-label and nutritionally superior plant-based alternatives

### NUMBER OF EMPLOYEES & DIVERSITY

71 FTEs, of which 55.4% are female employees

# Heura®

COMPANY **Foods for Tomorrow, S.L.**

HEADQUARTERS **Spain**

MARKET **Food**

CEO **Marc Coloma**

WEBSITE **www.heurafoods.com**

[1] Food and Agriculture Organization (FAO). (2021). Livestock's Long Shadow: Environmental Issues and Options. Retrieved from [here](#).

[2] United Nations Environment Programme (UNEP). (2023). Agriculture, Forests and Other Land Use. Retrieved from [here](#).

[3] United Nations Environment Programme (UNEP). (2020). 10 things you should know about industrial farming. Retrieved from [here](#).

[4] EIT Food (2024). Consumer perceptions unwrapped: ultra-processed foods (UPF). Retrieved from [here](#).

[5] Good Food Institute (GFI). (2023). State of the Industry Report: Plant-Based Meat, Eggs, and Dairy. Retrieved from [here](#).

[6] Heura Foods (2024). Impact Report 2023. Retrieved from [here](#).



# In Ovo

## Hatching a new era: innovating in poultry farming to boost chick welfare

### About

**In Ovo's technology is a groundbreaking innovation in poultry production that focuses on improving animal welfare and efficiency.**

In Ovo's screening machine, called Ella®, determines the gender of chicken embryos at an early stage, enabling informed decisions to be made during incubation. After ten years of development, Ella® produced the first cull-free chicks in 2020. Today, the technology consists of an inline, fully automated system that integrates seamlessly into existing hatchery processes with an increased capacity to match the high production volumes in modern hatcheries.

### ESG key figures

**99%**

GHG emissions avoided/reduced

**4.5 million**

male chicks are prevented from hatching in 2024

**36.054 tons**

CO<sub>2</sub> eq avoided

### Related UN SDGs\*



**2.4** Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production and help maintain ecosystems



**12.2** Achieve the sustainable management and efficient use of natural resources (material footprint)



**13.2.1** Operationalize of an integrated plan that fosters low GHG without threatening food production

\*SDGs are illustrative and not externally verified.

## Positive impact

### Sustainability problem

Approximately 7 billion male chicks are killed every year in the egg industry shortly after they are hatched. This means that baby male birds are discarded like trash into massive grinders on the first day of their lives after breaking free from their shells.

The reason is that raising male chicks is economically unviable for chicken hatcheries. The male chicks cannot lay eggs and their meat production potential is limited—both in quantity and quality – compared with female chickens. To avoid allocating resources for non-productive birds, on the first day of their lives, male chicks are separated and culled.

The practice of chick culling has been strongly criticized as unethical in Europe. Germany, France and Switzerland have passed legislation banning the practice. The poultry industry will now be required to implement in ovo sexing technology to prevent male chicks from being born in the first place.

### Sustainability solution

In Ovo has developed the most advanced high-throughput screening machine for the poultry industry that is capable to determining an embryo's sex within the egg before hatching.

In Ovo's Ella® machine makes it possible to identify male eggs and remove them early in the incubation process, preventing unnecessary culling. This innovation enables the poultry sector to align with consumer preferences for more sustainably produced eggs, addressing pressing ethical concerns and minimizing the environmental footprint of egg production.

By identifying male eggs early in the incubation process, In Ovo significantly reduces the need for incubation capacity, avoiding the depletion of resources, particularly energy consumption required during the incubation of male chicks until hatching, just to kill them afterwards.

Without In Ovo, the raising of the male chicks would lead to significantly higher emissions of CO<sub>2</sub> eq for a small amount of low-quality meat that is not fit for human consumption.

## Company facts

### PRODUCT & TECHNOLOGY

Mass spectrometry-based technology for identifying egg gender in hatcheries

### USP

Most advanced technology in terms of speed, accuracy, chicken breeds and unit costs

### NUMBER OF EMPLOYEES & DIVERSITY

46.78 FTEs, of which 22% are female employees



COMPANY In Ovo B.V.

HEADQUARTERS Netherlands

MARKET Agriculture

CEO Wouter Bruins and Will Stutterheim

WEBSITE [www.inovo.nl](http://www.inovo.nl)



# SQIM

## Mycelium: valorizing residual substrates to boost responsible luxury fashion and living environments

### About

SQIM is a multi-product company pioneering mycelium-based biofabrication processes, offering fossil-free alternative materials.

SQIM's technology platform uses mycelium, the root-like system of fungi, and a proprietary fermentation technology to develop high-quality biomaterials in two product lines: EPHEA, specializing in alternative leather, and MOGU, focusing on composite materials for wall panels and flooring.

SQIM's biofabrication exhibits a positive impact, making the fashion, interior design, and construction industries more sustainable.

### ESG Key Figures

**64%**

GHG emissions avoided/reduced

**100%**

biomass comes from Europe

**100%**

of EPHEA raw material is biodegradable

### Related UN SDGs\*



**11.6** Reduce the adverse per capita environmental impact of cities



**12.2** Achieve the sustainable management and efficient use of natural resources (Material Footprint)



**15.1** Ensuring the conservation, restoration and sustainable use of terrestrial ecosystems and their services

\*SDGs are illustrative and not externally verified.

## Positive impact

### Sustainability Problem

The challenges of sustainability in the fashion and construction industry are diverse and complex. They range from the overuse of natural resources to the serious environmental impact of production processes.

The global fashion industry is responsible for 3 - 8 % of the GHG emissions and the leakage of 9% of microplastic losses into our oceans [1]. Animal leather production not only contributes significantly to these figures, but also is projected to slaughter 430 million cows annually by 2025 to keep up with the rising consumer demand for leather goods [2]. An estimated 80% of leather is treated with chromium during the tanning process, a chemical that pollutes waterways and puts the health of leather workers and local communities at risk.

Given brand sustainability pressures, the global appetite for alternative materials is on rise, especially in the luxury sector.

The construction industry, on the other hand, is a massive consumer of fossil-based materials and energy, generating 39% of the world's carbon emissions [3]. Although the major challenges are in energy efficient infrastructure and carbon footprint of building materials such as concrete and steel, sustainability in interior design is a growing matter. The main problems are around the overuse of non-renewable resources in interior elements and the indoor air quality, affected by materials such as paints, adhesives, and finishes, emitting volatile organic compounds that can harm human health.

### Sustainability Solution

SQIM aims to co-designing with nature, creating high-quality naturally grown materials using a versatile biotech platform: mycelium.

Mycelium, is the pillar of SQIM's circular business model. Harnessing the power of fungi biology, known for its natural recycling abilities and filament-like root structures, SQIM transforms residual substrates into high-value materials using minimal energy inputs.

SQIM's cultivated mycelium, grown using low value agro-industrial residues, can be coaxed to grow in specific densities and structures. This imparts the end-product with attributes such as strength, fire resistance, insulation, and biodegradability, enabling the creation of highly functional products decoupled from the use of animals or synthetic chemicals.

EPHEA™, SQIM's flagship product, is not just an animal- leather replacement but a revolutionary material exceeding the quality standards of luxury brands. MOGU™, on the other hand, offers first-of-its-kind acoustic panels and 100% made entirely of mycelium and upcycled textile residues, bio-based flooring systems.

SQIM's sustainability contributions result in substantial reductions of GHG emissions, with savings between 45% to 86% when comparing EPHEA material with bovine leather. The company's adoption of green electricity and green chemistry, which includes selecting additives like biobased resins and natural waxes and dyes, further enhances these savings while mitigating the harmful effects of synthetic chemicals on people and the planet.

## Company Facts

### PRODUCT & TECHNOLOGY

**Mycelium-based materials for fashion and interior design**

### USP

**Proprietary, semi-liquid fermentation technology coupled with proprietary mycelium strain that grows dense biomass**

### NUMBER OF EMPLOYEES & DIVERSITY

**26 FTEs, of which 50% are female employees**

COMPANY **SQIM S.R.L.**

HEADQUARTERS **Italy**

MARKET **Consumer Goods**

CEO **Stefano Babbini**

WEBSITE **www.sqim.bio**

[1] Janmark, J., et al. (2024). Sustainable Style: How Fashion Can Afford and Accelerate Decarbonization. Retrieved from [here](#).

[2] Pitcher, L. (2022). Leather is bad for animals and the planet — but what if we made it in a lab?. Retrieved from [here](#).

[3] Crawford, R. H. (2022). Greenhouse Gas Emissions of Global Construction Industries. IOP Conf. Ser.: Materials Science and Engineering, 1218, Retrieved from [here](#).



# Nuritas

## Cracking the code of nature: revolutionizing health and nutrition through advanced AI and peptides

### About

Nuritas is revolutionizing the discovery of novel, natural and scientifically proven bioactive ingredients with the aim of helping companies innovate towards healthier accessible products.

The company employs a disruptive computational approach to peptide discovery, integrating principles from molecular and evolutionary biology, computer analysis, biochemistry, mathematics and AI. This enables rapid and efficient prediction, unlocking the most health beneficial active components hidden within plants and natural food sources, known as peptides.

Nuritas has established the world's largest peptide knowledge base.

### ESG key figures

**100%**

commercialized ingredients with clinically validated efficacy and safety

**100%**

renewable energy

**>9.0 million**

different peptides compiled in a unique curated library

### Related UN SDGs\*



**3.4** Reduce premature mortality from non-communicable diseases through prevention and promotion of well-being



**13.2.1** Operationalize of an integrated plan that fosters low GHG without threatening food production



**15.1** Ensure the conservation, restoration and sustainable use of terrestrial ecosystems and their services

\*SDGs are illustrative and not externally verified.

## Positive impact

### Sustainability problem

As our global population ages and timely preventive and therapeutic medicine remains elusive, extending consumers' healthy lifespans through nutrition can significantly impact national health expenditures and our environment.

The healthcare industry, a major carbon emitter, contributes to 4.4 - 4.6% of worldwide GHG emissions [1]. These emissions stem from healthcare facilities, supply chains and goods manufacturing. In this context, health promotion becomes essential to mitigate the economic and environmental costs of healthcare systems and medicine use and production.

Consider diabetes, for example. In the EU, 32.3 million people were diagnosed with diabetes in 2019, with an additional 24.2 million estimated to be undiagnosed. Worldwide, 90% of all diabetes patients have the type 2 form. In the EU, the health expenditures allocated to treat diabetes and prevent complications are estimated at about EUR 150 billion in 2019, averaging EUR 3,000 per diabetic adult per year [2].

Another common health concern is muscle loss. From the age of 30, people lose up to 1% of muscle per year. By age 80, individuals who do not exercise lose up to 40% of muscle mass, more significantly impacting menopausal women, aging populations and those battling long-term fatigue.

### Sustainability solution

Nuritas enables resource efficiency by discovering bioactive peptides used in functional foods that are beneficial for human health, nutrition and well-being.

The peptides from Nuritas are identified in nature and unlocked from commonly consumed food proteins such as legumes, grains and beans. These proteins undergo safe enzymatic hydrolysis – using regulatory approved food-grade enzymes and sustainable production practices – resulting in products that are inherently safe for human consumption.

The cutting-edge active ingredients from Nuritas are derived from natural, clean-label, plant-based proteins. They exhibit cell-signalling properties, optimizing bodily functions. The company's three proprietary products – PeptiStrong, PeptiSleep and PeptiControl– are clinically validated to improve muscle health, improve sleep quality and manage glucose levels in food.

By replacing unwanted food ingredients with sustainable and healthy alternatives, Nuritas indirectly alleviates strain on the healthcare industry. This leads to indirect pollution reduction and fewer GHG emissions, while contributing to a more natural and eco-friendly food system.

Nuritas has also identified active peptide ingredients for aging pets and food preservation, both of which have impacts on animal health and lower reliance on non-natural chemicals in our day-to-day life.

## Company facts

### PRODUCT & TECHNOLOGY

AI-precision technology to discover cell-signalling peptide ingredients

### USP

Without the Nuritas proprietary AI platform, the MagnifierNT™, the benefits of bioactive compounds hidden in plant proteins would remain unavailable

### NUMBER OF EMPLOYEES & DIVERSITY

49 FTEs, of which 47% are female employees



COMPANY **Nuritas Ltd.**

HEADQUARTERS **Ireland**

MARKET **Food; personal care**

CEO **Nora Khaldi**

WEBSITE **www.nuritas.com**

[1] Health Care Without Harm & Arup (2019); Health Care's Climate Footprint: How the health sector contributes to the global climate crisis and opportunities for action. Retrieved from [here](#).

[2] Internal, Nuritas© and ™ 2022 Nuritas Ltd, all rights reserved



# OroraTech

## Pioneering space-based intelligence solutions for climate resilience

### About

OroraTech is a global leader in thermal infrared satellite monitoring, offering cutting-edge space-based solutions for wildfire prevention, forestry management and climate adaptation.

The company's SaaS platform integrates proprietary nanosatellite data with AI-powered analytics, providing real-time risk assessments and situational awareness forecasts to governments, emergency responders and commercial clients across the forestry, agriculture, insurance and energy sectors.

OroraTech's innovative approach blends hardware, software and predictive modelling to create a holistic fire intelligence system, delivering unparalleled data accuracy and rapid response capabilities in wildfire-prone areas worldwide.

### Related UN SDGs\*



**11.5** Significantly reduce the number of deaths and people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters



**13.1** Strengthen resilience and adaptive capacity to climate-related disasters



**15.1** Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services

\*SDGs are illustrative and not externally verified.

## Positive impact

### Sustainability problem

Wildfires are the existential threat of the 21st century, responsible for the greatest environmental and economic impacts.

As global temperatures rise and extreme weather events become more frequent, wildfires are increasing in intensity, duration and unpredictability. In 2023 alone, wildfires released 6,687 megatons of CO2 globally, which was more than double the carbon dioxide emissions by the European Union due to the burning of fossil fuels in the same year [1]. The economic impact in the United States alone is staggering, with an estimated USD 394 billion to USD 893 billion in damages annually, including destroyed ecosystems, infrastructure losses and public health costs [2].

Traditional wildfire detection methods rely heavily on ground-based cameras, aerial patrols, and human observation, which often result in delayed response times—sometimes taking hours or even days to detect a fire. By the time conventional systems identify a wildfire, it has often grown out of control, leading to widespread destruction of forests, human settlements and biodiversity.

The consequences extend beyond environmental degradation. Wildfires impact public health by releasing toxic smoke and fine particulate matter (PM2.5), exacerbating respiratory diseases and cardiovascular conditions [3].

Additionally, the economic burden of fire suppression, disaster recovery and insurance claims has placed immense strain on governments and businesses worldwide. Without rapid and scalable early warning solutions, global wildfire events will continue to worsen, further accelerating climate change, biodiversity loss and economic instability.

### Sustainability solution

OroraTech is redefining wildfire detection and prevention by deploying cutting-edge thermal intelligence satellites to identify fires before they escalate into catastrophic disasters.

Unlike traditional fire detection methods that rely on human observation, ground sensors or aerial surveillance, OroraTech's nanosatellite constellation provides a real-time, 24/7 global monitoring systems, that detects wildfires instantly—even in remote areas, through thick smoke and at night. This instantaneous visibility ensures that emergency responders receive critical alerts within minutes instead of hours, allowing them to act swiftly and prevent further devastation.

At the core of OroraTech's innovation is its AI-driven predictive modelling, which integrates historical fire data, real-time weather patterns and vegetation analytics to forecast wildfire behaviour (the path and intensity of fires), allowing the preemptive deployment of resources to the most vulnerable locations. This predictive capacity empowers governments, forestry agencies and insurers to mitigate risks, minimize losses and strengthen climate resilience.

Beyond fire detection, OroraTech's technology plays a pivotal role in mitigating climate change. By enabling faster wildfire suppression, the company is preventing the release of millions of tons of CO2 into the atmosphere every year.

The cost-effective scalable platform ensures that climate resilience is no longer a reactive process but a proactive, data-driven solution that saves forests, communities and lives.

## Company facts

### PRODUCT & TECHNOLOGY

AI-powered nanosatellite thermal imaging for wildfire prevention

### USP

Real-time fire detection, AI-driven risk assessment, and predictive wildfire modelling

### NUMBER OF EMPLOYEES & DIVERSITY

105 FTEs, of which 31% are female employees



COMPANY **OroraTech GmbH**

HEADQUARTERS **Germany**

MARKET **Climate-technology**

CEO **Dr.Martin Langer**

WEBSITE **www.ororatech.com**

[1] FAO (2024). The State of the World's Forests 2024 - Forest-sector innovations towards a more sustainable future. Rome. Retrieved from [here](#).

[2] JEC (2023). Climate-exacerbated wildfires cost the U.S. between \$394 to \$893 billion each year in economic costs and damages. Retrieved from [here](#).

[3] Samborska, V. and Ritchie, H. (2024) - "Wildfires" Published online at OurWorldinData.org. Retrieved from [here](#).

# Paptic

## Transforming packaging with bio-based material, reducing plastic pollution

### About

**Paptic develops sustainable and circular materials to replace fossil-based plastic films in flexible packaging.**

The company's patented technology combines the versatility and functionality of plastics with the sustainability of natural fibres.

Paptic® is a recyclable, wood-fibre-based alternative to plastic and paper, designed for hygiene and surface-sensitive packaging—like electronics, appliances and delicate items—as well as carrier bags. Unlike traditional paper, it offers moisture resistance, durability and flexibility for various flexible packaging uses. Paptic® retains the key qualities of paper in that it both renewable and recyclable.

### ESG key figures

**50%**

GHG emissions avoided/reduced

**100%**

of Paptic® materials are recyclable

**26%**

of revenue is dedicated to R&D of sustainable solutions

### Related UN SDGs\*



**9.4** Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes



**12.2** Achieve the sustainable management and efficient use of natural resources (material footprint)



**15.1** Ensure the conservation, restoration and sustainable use of terrestrial ecosystems and their services

\*SDGs are illustrative and not externally verified.

## Positive impact

### Sustainability problem

**Plastics are ubiquitous and pose a myriad of environmental challenges due to their durability and widespread use.**

From packaging materials to industrial applications, the versatility and cost-effectiveness of plastic have led to a massive global dependency. Surpassing 450 million tons annually [1], plastic production has fuelled a surge in consumption, resulting in a notable increase in mismanaged waste and widespread environmental pollution.

The slow degradation of plastic waste results in the formation of microplastics, which can infiltrate the water and soil, entering the food chain and potentially endangering human health. Moreover, they can remain in the environment for hundreds to thousands of years. Annually, between 19 and 23 million tons of plastic waste leaks into aquatic ecosystems, polluting lakes, rivers and seas [2], while on land, plastic waste poses significant concerns by impacting landscapes, animal habitats and biodiversity.

The production of plastics involves the extraction of fossil fuels and the emission of greenhouse gases, contributing to climate change. Furthermore, the incineration of plastics releases toxic pollutants into the air, exacerbating air quality issues.

### Sustainability solution

**Paptic has developed a cellulose-based and recyclable material as a substitute for plastic films in various flexible packaging applications.**

From carrier bags to hygiene and non-food (surface-sensitive) product packaging, Paptic® offers a versatile solution that set new standards in the packaging industry and meet the needs of modern, sustainability-driven businesses. Compared with traditional paper, Paptic® provides exceptional strength, durability, and a distinctive tactile feel. Made from renewable wood fibres sourced from responsibly managed forests, it is also fully recyclable within existing paper and cardboard waste streams, supporting high recycling rates.

Additionally, Paptic® is designed for reuse in various applications, making it a durable and environmentally conscious alternative to fossil-based flexible packaging materials.

Altogether, the renewable feedstock, recyclability, and product efficiencies of Paptic® including biogenic removals and recyclable fibres result in lower GHG emissions compared with fossil-based plastics.

Delivered in reels and sheets, Paptic® is manufactured on conventional paper machines and processed on existing packaging lines. This ensures scalability for manufacturers, converters, brands and retailers aiming to transition from fossil-based packaging to renewable and recyclable at -scale packaging, thereby reducing their environmental footprint.

## Company facts

### PRODUCT & TECHNOLOGY

**Bio-based packaging that is sustainable, recyclable, and innovative**

### USP

**Unique strength and flexibility, enabling runnability on installed packaging lines; foam-tech first-of-its-kind materials for the packaging market**

### NUMBER OF EMPLOYEES & DIVERSITY

**39.8 FTEs, of which 57% are female employees**



COMPANY **Paptic Ltd.**

HEADQUARTERS **Finland**

MARKET **Packaging**

CEO **Tuomas Mustonen**

WEBSITE **www.paptic.com**

[1] Ritchie, H., et.al. (2023). Plastic Pollution. Published online at OurWorldInData.org. Retrieved from: [here](#).

[2] UN Environment Programme (2024). Plastic Pollution. Retrieved from [here](#).



# Peel Pioneers

## Closing the loop by upcycling orange peel into high-value, circular ingredients

### About

PeelPioneers offers a fully circular solution for orange peel residues, which are still commonly incinerated in many countries.

Using advanced biorefinery technology, the company transforms citrus peels into high-value ingredients such as functional fibres, essential oils and citrus extracts. These natural ingredients are used across the food, cosmetics and cleaning industries.

PeelPioneers is preparing for international expansion, from the Netherlands to a new production facility in Spain. In 2024, PeelPioneers filed new patents and upgraded its facility to meet the highest food safety standards (FSSC 22000).

### ESG key figures

**65%**

GHG emissions avoided/reduced

**11,200 tons**

of peel will be processed in 2025

**98%**

of citrus peel dry matter is reutilized

### Related UN SDGs\*



**11.6** Reduce the adverse environmental impact of cities, including by paying special attention to municipal waste management



**12.2** Achieve sustainable management and efficient use of natural resources (material footprint)

**12.5** Substantially reduce waste generation through prevention, reduction, recycling and reuse



**13.2.1** Operationalize of an integrated plan that fosters low GHG without threatening food production

\*SDGs are illustrative and not externally verified.

### Positive impact

#### Sustainability problem

In the agri-food sector, global food waste accounts for 10% of greenhouse gas (GHG) emissions, which is nearly twice the annual emissions generated by all cars driven in the United States and Europe combined.

Oranges, in particular, have witnessed a boost in consumption due to the widespread availability of commercial juicers in supermarkets, resulting in significant volumes of leftover orange peel. In the Netherlands alone, approximately 250,000 tons of citrus waste are generated annually [1].

Traditional methods for managing citrus peel waste, such as composting and incineration, pose challenges. Composting processes are slow, while incineration leads to direct GHG emissions, exacerbating environmental concerns. The high water content in the peel (around 80%) lowers the efficiency of the incinerators because water heating is energy-intensive and the acidic nature of the peel corrodes incinerator installations.

Moreover, utilizing citrus peel for biogas production is hindered by the presence of d-limonene, which significantly reduces biogas yield because it adversely affects the microorganisms essential for its production. Thus, other outlets for valorization would be more efficient.

#### Sustainability solution

PeelPioneers' technology processes up to 40,000 kg of orange peel daily that would be otherwise incinerated, saving 0.7 tons of CO<sub>2</sub> per ton of peel.

PeelPioneers operates a closed-loop system. Oranges sold to supermarkets, hotels and restaurants are juiced, and the leftover peel is collected and upcycled into high-value ingredients like orange fibre, orangeade and essential oils. These natural ingredients become a circular solution that find applications in various industries, including food, cosmetics, and cleaning products, supporting savings in GHG emissions and water consumption.

Over three years, PeelPioneers' facility has processed 35,000 tons of orange peels –cutting 26,000 tons of CO<sub>2</sub>, equivalent to 10,300 return flights to New York or the annual absorption of 10,300 hectares of forest.

By extending the lifecycle of orange residues, PeelPioneers reduces the demand for virgin raw materials and promotes efficient resource use. Their locally sourced model minimizes transport-related emissions, while their circular ingredients support clean-label product development across various sectors. This integrated impact enables manufacturers and consumers to actively contribute to a more sustainable and circular food system.

### Company facts

#### PRODUCT & TECHNOLOGY

High-value functional ingredients from orange peels using cutting-edge circular biorefinery technology.

#### USP

First-mover in circular orange upcycling, offering a clean-label, scalable alternative to conventional ingredients

#### NUMBER OF EMPLOYEES & DIVERSITY

47 FTEs, of which 19% are female employees



COMPANY **Peel Pioneers B.V.**

HEADQUARTERS **Netherlands**

MARKET **Food, feed, personal care**

CEO **Bas von Wieringen & Sytze van Stempvoort**

WEBSITE **www.peelpioneers.nl**

[1] Suri, S., et al. (2021). Recent advances in valorization of citrus fruits processing waste: a way forward towards environmental sustainability. Food Science and Biotechnology, 30, 1601–1626. DOI: 10.1007/s10068-021-00984-y. Retrieved from [here](#).



# Protix

## Breaking boundaries in sustainable nutrition leading the insect-based protein revolution

### About

Protix is the leading company in insect-based ingredients for healthy and sustainable pet food, animal feed and organic fertilizer.

Protix is at the forefront of the rapidly developing market for circular and sustainable insect-based ingredients. The company breeds larvae of the black soldier fly (BSF), which is fed with organic waste from the food industry and processed into sustainable ingredients such as proteins and lipids which are commercialized by the feed industry.

Protix operates the first industrial insect facility, making it the largest insect producer in the world with products offered in over 15 countries.

### ESG key figures

**91%**

GHG emissions avoided/reduced

**24x less CO<sub>2</sub>eq**

from PureeeX<sup>®</sup> compared with poultry meat

**330 litres of water saved**

of water saved per kilogram of ProteinX<sup>®</sup> use

## Positive impact

### Sustainability problem

The world's population is projected to exceed nine billion by 2050, leading to a 48% increase in food demand and a 40 to 75% increase in total protein demand [1]. However, this surge in demand is juxtaposed with concerning statistics: 1 billion tons of food are wasted annually, with over 100 million tons of protein locked away in discarded food [2].

Protein is essential for both direct human consumption and for livestock and fish production, playing a crucial role in immune function, cell structure and repair, muscle health and providing amino acids.

However, the supply of protein from meat, fish and plant-based sources like soy struggles to meet protein needs sustainably.

Notably, 18% of global anthropogenic GHG emissions stem from animal agriculture, while feed crops such as soy and cereals demand significant agricultural inputs like fertilizers and pesticides as well as resources like water, energy and land. This results in environmental effects such as pollution, deforestation, biodiversity loss and freshwater depletion.

In aquaculture, feeding fish with fishmeal and the extraction of fish oil from wild fish stocks raises concerns about overfishing and pressures on maritime resources.

### Sustainability solution

Protix is using insect-based solutions to address the protein crisis and its related GHG footprint while minimizing food waste.

By leveraging insects' nutrient storage capacity, Protix transforms low-grade food waste into valuable high-end proteins for aquafeed and high-quality purified oil for piglet feed. The resulting protein meal has applications as a high-quality ingredient for feed and food across all market segments. Frass, the major residual stream, is turned into organic fertilizer, with visible benefits for plant health and development. In this way, insects close the loop and bring the food system back into balance with nature.

Black soldier fly larvae are among nature's most efficient composters, rapidly converting organic waste with minimal resources. The Protix facility, opened in 2019, unites breeding, rearing and processing under one roof to ensure a consistent, high-quality supply and reduce emissions. This set-up supports diverse feed and food applications, with Protix fostering partnerships to advance the use of insect-based ingredients worldwide.

Insect protein has the lowest GHG footprint per kilogram of any protein source when production, land use and transportation are considered. For Protix, replacing animal or plant-based proteins and fats with insect-based ingredients is a logical step towards reducing the environmental impact of protein production in the feed industry.

### Related UN SDGs\*



**12.2** Achieve the sustainable management and efficient use of natural resources (material footprint)



**14.2** Sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts



**15.1** Ensure the conservation, restoration and sustainable use of terrestrial ecosystems and their services

\*SDGs are illustrative and not externally verified.

## Company facts

### PRODUCT & TECHNOLOGY

Developer of insect-based protein, oil and fertilizer, upcycling various side streams

### USP

Unrivalled capacity to deliver consistently premium-quality insect ingredients on an industrial scale

### NUMBER OF EMPLOYEES & DIVERSITY

150 FTEs, of which 30% are female employees



COMPANY **Protix B.V.**

HEADQUARTERS **Netherlands**

MARKET **Feed**

CEO **Robert Claasen**

WEBSITE **www.protix.com**

[1] World Resources Institute. (2019). Creating a Sustainable Food Future: A Menu of Solutions to Feed Nearly 10 Billion People by 2050. Retrieved from [here](#).

[2] European Commission. (n.d). EU actions against food waste. Retrieved from [here](#).



# RED Horticulture

## Cultivating tomorrow: Smart LED lighting solutions to boost crop performance and energy efficiency

### About

**RED Horticulture ("RED") is an IoT-based LED lighting solutions provider to greenhouse growers worldwide.**

RED manufactures smart LED lighting solutions driven by agronomy and photobiology. Paired with intelligent proprietary software and a library of more than one hundred light recipes, the fully dynamic LED lights enable growers to optimize their plants' growth, crop yields and quality and their energy usage. RED's innovative solution benefits high-tech greenhouses for flowers and vegetables, growing a diverse range of (young) plants.

### ESG key figures

**43%**

GHG emissions avoided/reduced

**48%**

energy savings compared with HPS

**18%**

energy savings compared with LED

## Positive impact

### Sustainability problem

**The European greenhouse horticulture market has grown significantly due to factors such as increased demand for fresh and locally produced food and concerns about food security in a context of a growing population.**

Unlike open fields, where crops are exposed to unpredictable weather conditions, greenhouses allow farmers to create a stable and controlled environment for plant growth. However, greenhouses also face sustainability challenges.

Greenhouse growers often use supplemental lighting to produce uniform, consistent and high-quality crops all year round. Traditional greenhouse lighting systems, particularly those utilizing high-pressure sodium (HPS) lamps, frequently result in excessive energy consumption, leading to elevated operational costs and environmental impact.

Up to 80% of the HPS energy consumption is converted into heat instead of usable light [1]. This excess heat causes the evaporation of nutrients and the degradation of oils in plants and fruits, as well as the emission of CO<sub>2</sub>eq. While the effects of this excess heat can be alleviated by adding nutrients and water, this inefficient utilization of critical resources poses a significant obstacle to achieving sustainable agriculture.

### Sustainability solution

**RED is at the forefront of developing LED lighting technologies that guarantee energy efficiency and optimized of plant growth.**

RED's innovations are centred around its fully controllable dynamic spectrum and photobiology recipes that are tailored to specific plant species. Besides the optimized RED T dynamic luminaires and RED Sense sensors, RED offers an integrated smart control system called MyRED. It allows growers to adjust lighting in real time based on climatic conditions and plant needs according to crop type and stage of development. This integration delivers unparalleled value for farmers by optimizing energy consumption and maximizing crop performance, ultimately contributing positively to crop yield and food security.

These pioneering approaches not only reduce energy usage and associated CO<sub>2</sub> emissions but also offer a cost-effective solution that significantly cuts operating costs. RED systems enable over 48% energy savings compared with HPS lighting and over 18% energy savings compared with fixed LED systems at equivalent yields. These advances make substantial contributions to reducing the footprint of controlled-environment agriculture, enhancing greenhouse operations and alleviating pressure on land, biodiversity and natural habitats.

## Related UN SDGs\*



**2.4** Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production and help maintain ecosystems



**12.2** Achieve sustainable management and efficient use of natural resources (material footprint)



**13.2.1** Operationalize of an integrated plan that fosters low GHG without threatening food production

## Company facts

### PRODUCT & TECHNOLOGY

**Smart LED lighting systems for optimal plant growth**

### USP

**Technological superiority that reduces energy usage and enhances quality**

### NUMBER OF EMPLOYEES & DIVERSITY

**31 FTEs, of which 25% are female employees**



COMPANY **Rouge Engineered Designs SAS**

HEADQUARTERS **France**

MARKET **Agriculture**

CEO **Yassine El Qomri**

WEBSITE **www.horticulture.red**

\*SDGs are illustrative and not externally verified.

[1]TSR grow (2021).LED Grow Lights vs. HPS Grow Lights - It's Time to Switch. Retrieved from [here](#).



# REDUCED

## Revolutionizing the future of food and savoury ingredients through upcycling and fermentation

### About

**REDUCED is pioneering a new wave of clean-label, natural and sustainable food ingredients.**

By leveraging fermentation techniques and enzymatic hydrolysis, REDUCED transforms vegetable and animal side streams into organic savoury flavour compounds. This innovative approach provides cost-effective, natural alternatives to synthetic flavourings, making food more sustainable without compromising taste.

REDUCED sells its B2B taste solutions to the food service and food industry segments, creating impact at scale. With a strong focus on circular bioeconomy principles, the company is tackling one of the most pressing challenges in the food sector: food loss, food waste and resource inefficiency.

### Related UN SDGs\*



**2.4** Ensure sustainable food production systems



**12.3** Halve global food waste and reduce food losses along production and supply chains including post-harvest losses



**13.2.1** Operationalize of an integrated plan that fosters low GHG without threatening food production

\*SDGs are illustrative and not externally verified.

### Positive impact

#### Sustainability problem

**In a world where over 1.3 billion tons of food go to waste each year [1], the environmental cost is staggering. Food waste alone accounts for 8 to 10% of global greenhouse gas emissions, an often overlooked contributor to climate change [2].**

Beyond emissions, the inefficient use of food resources places additional pressure on arable land, water supplies and biodiversity. Meanwhile, the food industry continuously generates vast amounts of side streams and by-products, often discarding them due to a lack of viable reuse options. Paradoxically, these discarded resources are rich in nutrients and flavour compounds that could otherwise enhance food production sustainably

At the same time, the demand for clean-label ingredients has skyrocketed, driven by consumers seeking transparency, natural alternatives and healthier choices. However, many existing flavour enhancers rely on petrochemical synthesis, artificial additives or resource-intensive raw materials like soy and animal-derived extracts [3]. As regulatory bodies push for more sustainable sourcing and production, food manufacturers face an urgent need to adopt low-carbon, circular solutions that preserve both taste and environmental integrity.

This misalignment between wasteful food production systems and growing consumer demand for sustainable ingredients highlights a crucial gap in the market—one that REDUCED is uniquely positioned to address.

#### Sustainability solution

**REDUCED is at the forefront of a taste revolution, harnessing fermentation to extract natural umami and kokumi flavors from food industry by-products.**

Instead of letting valuable side streams go to waste, REDUCED has developed a process that upcycles discarded raw materials like broken rice, overgrown or bruised mushrooms, invasive shore crabs or discarded chicken parts, transforming them into rich, savoury flavour compounds. By applying advanced enzymatic hydrolysis, the company unlocks complex taste profiles that can replicate slow-cooked and roasted flavours—without relying on synthetic additives or intensive agricultural inputs.

This approach is not just about waste reduction; it is about creating high-value products with lower environmental footprints. By integrating low-carbon, zero-waste production practices, REDUCED's solution offers food manufacturers a way to enhance flavour naturally while simultaneously reducing their dependence on energy-intensive or artificial ingredients. The impact extends beyond taste—by valorizing food loss, REDUCED actively contributes to cutting greenhouse gas emissions, reducing food industry waste and fostering a circular bioeconomy.

The scalability of REDUCED's fermentation process also ensures widespread adoption across food segments, from industrial flavour houses to restaurant kitchens. With natural, organic-certified ingredients that align with consumer demand for cleaner labels, REDUCED is not just redefining how flavours are made—it is setting a new gold standard for sustainability in the global food industry.

### Company facts

#### PRODUCT & TECHNOLOGY

**Fermentation-based savoury flavour compounds/ingredients**

#### USP

**Unique clean-label and organic taste solutions derived from proprietary fermentation techniques**

#### NUMBER OF EMPLOYEES & DIVERSITY

**31 FTEs, of which 40% are female employees**

## REDUCED®

COMPANY **REDUCED ApS.**

HEADQUARTERS **Denmark**

MARKET **Food**

CEO **Emil Munk de Voss**

WEBSITE **www.reducedfoods.com**

[1] United Nations Environment Programme (UNEP). (2021). Food Waste Index Report 2021. Retrieved from [here](#).

[2] International Food Policy Research Institute (IFPRI). (2022). Climate-smart food systems: The role of sustainable production. Retrieved from [here](#).

[3] Future Market Insights (FMI). (2023). Clean Label Ingredients Market Outlook 2023-2033. Retrieved from [here](#).



# watttron

## Pioneering precision heating for sustainable packaging manufacturing

### About

**Watttron is transforming industrial heating with its digital precision technology, driving efficiency, material savings and sustainability in packaging.**

Watttron's advanced heating matrices enable precise, localized temperature control—optimizing processes in plastic packaging, moulded fibre products and biopolymers thermoforming. With its patented, scalable, energy-efficient solutions, watttron empowers manufacturers to adopt monomaterial and fibre-based packaging, minimize waste and comply with increasingly stringent recyclability regulations.

Backed by deep-tech expertise, the company is establishing itself as a key enabler of efficient sustainable production, aligning industrial processes with the circular economy.

### Related UN SDGs\*



**9.4** Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes



**12.a** Strengthen scientific and technological capacity to move towards more sustainable patterns of consumption and production



**13.2.1** Operationalize of an integrated plan that fosters low GHG without threatening food production

### ESG key figures

**30%**

GHG emissions avoided/reduced

**Up to 50%**

material savings in thermoforming applications

**100%**

recyclable packaging material enabled

### Positive impact

#### Sustainability problem

**The global packaging industry generates over 400 million tons of plastic waste annually, with only 9% being recycled effectively [1].**

A major obstacle to improving recycling rates is the widespread use of multi-material packaging, which is difficult and costly to separate. In the EU alone, over 60% of plastic packaging waste remains non-recyclable, leading to landfill overflow, marine pollution and high carbon emissions from virgin plastic production [2].

During packaging manufacturing, conventional industrial heating processes further exacerbate environmental impact by consuming excessive amounts of energy and raw materials. Traditional heating technologies lack precision, leading to material wastage, inefficient energy use and increased production defects. This is especially problematic in thermoforming and sealing, where poor heat control results in excess plastic use, weak seals and high product rejection rates.

In response, governments worldwide are implementing strict regulations on plastic use and recycling. The EU's Packaging and Packaging Waste Regulation (PPWR) mandates that all packaging must be recyclable by 2035, driving manufacturers towards monomaterial solutions [3]. However, these materials are more challenging to process with conventional heating technologies, requiring new innovations to maintain production efficiency.

#### Sustainability solution

**Watttron's heating technology is the proven enabler for the packaging industry to reduce, reuse and recycle plastics.**

Watttron's digital heating solutions revolutionize thermoforming, sealing and lamination, enabling manufacturers to transition to sustainable, recyclable materials without compromising efficiency. With increasing regulatory pressure for monomaterial packaging, reduced energy consumption and enhanced recyclability, watttron's innovative solutions provide a key enabler for sustainable production.

The company's digital sealing technology –cera2seal– optimizes thermoforming, sealing and lamination, showcasing advances in energy efficiency, reduced packaging waste and improved overall product quality during packaging manufacturing. watttron's patented matrix heating system –cera2heat– allows precise, pixel-based heating, enabling material savings of 10 to 50% and optimizing the production and use of monomaterials, which have the potential for improved recyclability at the end of their life cycle. Both technologies can be seamlessly integrated into existing process set-ups, enabling manufacturers to comply with stringent EU regulations on packaging recyclability while maintaining high performance. While the material savings made by cera2heat can result in 10 to 30% GHG emission reductions, cera2seal energy consumption optimization enables GHG emission savings of over 80% compared with standard heat sealing.

Operating in Germany and the United States, watttron collaborates with leading OEMs and global brands to deliver scalable, future-proof heating solutions that meet the demands of the circular bioeconomy.

### Company facts

#### PRODUCT & TECHNOLOGY

**Digital pixel-based heating systems for packaging manufacturing**

#### USP

**Heating technology to enable precise processing of materials, making packaging more sustainable and fully recyclable**

#### NUMBER OF EMPLOYEES & DIVERSITY

**77 FTEs , of which 26% are female employees**



COMPANY **Watttron GmbH**

HEADQUARTERS **Germany**

MARKET **Packaging**

CEO **Marcus Stein**

WEBSITE **www.watttron.com**

\*SDGs are illustrative and not externally verified.

[1] Hannah Ritchie, Veronika Samborska and Max Roser (2023) - "Plastic Pollution" Published online at OurWorldinData.org.. Retrieved from [here](#).

[2] Eurostat (2024). Packaging waste statistics. Retrieved from [here](#).

[3] EUR-Lex (2025). Regulation (EU) 2025/40 on packaging and packaging waste. Retrieved from [here](#).



# Weenat

## Transforming sustainable agriculture with smart irrigation technology

### About

Weenat is redefining agricultural water management with its precision irrigation technology and advanced agrometeorological solutions.

The company develops advanced sensor technology and digital tools that provide farmers with real-time, AI-powered insights based on a combination of IoT sensors, satellite data and predictive analytics, enabling farmers to optimize irrigation, enhance crop yields and reduce environmental impact.

Weenat's end-to-end precision farming ecosystem has a strong focus on data accuracy, efficiency and ease of use, driving the shift towards a net-positive agricultural system that balances productivity with environmental responsibility.

### ESG key figures

**20%**

GHG emissions avoided/reduced

**20%**

reduction of irrigation water usage

**43 million**

cubic metres of water saved annually

### Related UN SDGs\*



**2.4** Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems and strengthen capacity for adaptation to climate change, extreme weather, drought and other disasters



**6.4** Increase water-use efficiency and ensure sustainable withdrawals and supply of freshwater to address water scarcity



**13.1** Strengthen resilience and adaptive capacity to climate-related disasters

\*SDGs are illustrative and not externally verified.

### Positive impact

#### Sustainability problem

As climate change intensifies, farmers face growing challenges from water scarcity, unpredictable weather patterns and soil degradation.

Agriculture accounts for 70% of global freshwater withdrawals, making it the largest consumer of water worldwide [1]. However, over 60% of this water is wasted due to inefficient irrigation techniques, exacerbating the already critical issue of water scarcity [2].

With global population growth and changing climate conditions, the demand for food is increasing, yet access to water for agriculture is becoming more restricted. Droughts and extreme weather events are further destabilizing agricultural productivity, leading to yield losses in water-stressed regions. It is estimated that yield gaps, the unrealized potential in crop production, could increase by 2 to 30% due to concurrent drought conditions by the year 2100 [3].

Farmers often rely on traditional irrigation methods, which are based on outdated heuristics rather than real-time soil and weather data. This results in either over-irrigation, which depletes water resources and causes nutrient leaching, or under-irrigation, which reduces crop productivity. Without precision irrigation solutions, the agricultural sector will continue to face rising operational costs, lower yields and increased environmental degradation, making food production less sustainable in the long run.

#### Sustainability solution

Weenat is transforming agriculture with AI-powered precision irrigation, helping farmers cut water use by up to 20% while improving soil health and agricultural efficiency.

By combining real-time soil moisture sensors, high-resolution weather data and AI-powered predictive analytics, Weenat enables farmers to irrigate only when necessary, maximizing water efficiency. The company's IoT-enabled sensors continuously monitor soil moisture levels, temperature and rainfall, transmitting data to Weenat's mobile app. Farmers receive instant recommendations on when and how much to irrigate, reducing water waste. By preventing over-irrigation, Weenat also reduces soil degradation and nutrient runoff, preserving soil fertility for long-term agricultural productivity.

The widespread adoption of precision irrigation could significantly mitigate agriculture's impact on climate change. The company's data-driven approach lowers energy consumption by reducing unnecessary field visits, cutting farming expenses and carbon emissions —each Weenat sensor saves around 1 ton of CO2 over its lifetime.

Beyond individual farms, Weenat's scalable solutions benefit cooperatives, agribusinesses and policymakers, optimizing regional water management strategies. With the expansion of its sensor-free AI irrigation system (Meteoria), Weenat is making sustainable farming more accessible, driving agriculture towards a climate-resilient future.

### Company facts

#### PRODUCT & TECHNOLOGY

IoT-enabled soil moisture sensors and AI-driven irrigation forecasting

#### USP

Precise, real-time, hyper-local and field-specific data to improve efficiency in farming; superior materials and proprietary manufacturing methods.

#### NUMBER OF EMPLOYEES & DIVERSITY

62 FTEs, of which 45% are female employees



COMPANY Weenat SAS

HEADQUARTERS France

MARKET Agriculture

CEO Laurent Leleu

WEBSITE [www.weenat.com](http://www.weenat.com)

[1] Ritchie, H. and Roser, M. (2018) - "Water Use and Stress" Published online at OurWorldinData.org. Retrieved from [here](#).

[2] IEEP (2000), 'The environmental impacts of irrigation in the European Union'. Retrieved from [here](#).

[3] Miaolei, H. (2024). "Concurrent drought threatens wheat and maize production and will widen crop yield gaps in the future" Agricultural Systems, Volume 220, October 2024, 104056, Retrieved from [here](#).



# Looking Forward

## Looking Forward

The European Circular Bioeconomy Fund's (ECBF) commitment to delivering outstanding climate and industrial value remains unwavering. Our 2024 Impact Insights confirm that the European bioeconomy is already rewarding this conviction. Our oversubscribed EUR 300 million Article 9 fund has now seeded 18 growthstage companies that together generated roughly €80 million in 2024 revenue, safeguarded more than 957 European jobs and launched products with an average GHG footprint that is 46% below conventional fossil incumbents—clear evidence that purposealigned capital can translate planetary urgency into accelerated value creation well before exit.

ECBF's digital ESG infrastructure now verifies more than 120 ESG and impact KPIs for each investee. Combined with rigorous 'Do No Significant Harm' analysis, thirdpartyaudited GHG accounting and biodiversity checks, ECBF's approach keeps 100% of assets classified as sustainable in accordance with Article 9 of the SFDR, ensuring that every euro deployed realigns the economy with nature and underpins business strength.

Europe's EUR 2 trillion bioeconomy still leaves 75% of the region's biowaste untapped<sup>16</sup>, representing the continent's next engine of competitiveness and resilience. In the future, to leverage the market opportunities offered by sustainable business, ECBF will accelerate capital deployment, deepen active stewardship, extend its evidence framework for capturing positive biodiversity contributions and continue to lead rounds of between EUR 2.5 million and EUR 10 million to propel solutions from demonstration to industrial scale.

By coupling catalytic equity with hands-on board engagement, sector expertise, collaborative advocacy and a data-driven ESG backbone, ECBF will continue derisking the scaleup gap and strengthening Europe's resilience by building businesses—and returns—that flourish regardless of climate or geopolitical turbulence. We invite founders, limited partners, industry players and strategic allies to join us in cocreating this nature-positive, high-return future.



## Endnotes

<sup>1</sup> Bioeconomy shall be understood as the production of renewable biological resources (terrestrial or aquatic) and the conversion of these resources and waste streams into value-added products such as food, feed, bio-based products (products that are wholly or partly derived from materials of biological origin, excluding materials embedded in geological formations and/or fossilized) and bioenergy; circular bioeconomy shall be understood as projects related to the concepts of the circular economy, applied to all products, resources and materials that are of biological origin; circular economy shall mean an economy where the value of products, materials and resources is maintained in the economy for as long as possible and the generation of waste is minimized.

<sup>2</sup> The investment in countries associated with Horizon 2020 is defined in the fund's charter at the request of the EIB, ECBF's anchor investor. List retrieved from: [here](#).

<sup>3</sup> JRC-EC (2025). The Bioeconomy in the European Union in numbers. Retrieved from: [here](#).

<sup>4</sup> ECBF (2023). Impact Insights 2023. Opportunities in the Bioeconomy, p. 11. Retrieved from: [here](#).

<sup>5</sup> BIC (2024). Bio-waste generation in the EU: Current capture levels and future potential. Published by Bio-based Industries Consortium (BIC)/ Zero Waste Europe. Retrieved from: [here](#).

<sup>6</sup> WEF (2025). Global Risk Report 2025. Retrieved from: [here](#).

<sup>7</sup> KPMG (2025). Q1 '25 Venture Pulse Report: Europe. Retrieved from: [here](#).

<sup>8</sup> MunichRE (2025). Climate change is showing its claws: The world is getting hotter, resulting in severe hurricanes, thunderstorms and floods. Retrieved from: [here](#).

<sup>9</sup> Potsdam Institute for Climate Impact Research (2024). 38 trillion dollars in damages each year: World economy already committed to income reduction of 19% due to climate change. Retrieved from: [here](#).

<sup>10</sup> WWF (2022). 69% average decline in wildlife populations since 1970, says new WWF report. Retrieved from: [here](#).

<sup>11</sup> BMEL (\_\_\_\_). Retrieved from: [here](#).

<sup>12</sup> New Zealand Foreign Affairs & Trade (2023). Impact of drought on Spanish agriculture. Retrieved from: [here](#).

<sup>13</sup> Bolelli, S. (2024). Spain's devastating floods cost financial sector over \$20B. Retrieved from: [here](#).

<sup>14</sup> Elicit Plant develops solutions to cope with water shortages in broad acre crops.

<sup>15</sup> Weenat helps make significant water savings when irrigating broad acre crops.

<sup>16</sup> Ibid., 12p. Figures from JRC-EC (2025) and RC-EC (2025).

## Disclaimer

This publication ("Impact Insights") constitutes a marketing material and is to be read in conjunction with the private placement memorandum (PPM), including the pre-contractual disclosures of ECBF I SCSp. This publication under no circumstance aims to substitute legally mandated SFDR or EU Taxonomy-related disclosures. Impact Insights is issued by ECBF Management GmbH with the sole purpose of providing information about the sustainability topics, reflections, and updates relevant to be shared with the public, within the boundaries of data confidentiality. This publication does not amount to an offer or placement to potential investors to invest in the assets or shares of funds advised by ECBF Management GmbH.

The SDGs and biodiversity opportunities mentioned along the publication are not part of ECBF I SCSp ESG guidelines and are not a compulsory part of our SFDR status. The SDGs mentioned in this document were provided by the respective companies or selected by ECBF Management GmbH without cross-checking or externally verifying their fit.

The information set out herein is provided as of 31 December 2024, and ECBF Management GmbH is under no obligation to update, complete, revise, verify or amend the information contained in this publication and/or to provide any previous, current or future other materials in relation to ECBF or its products or services. This publication may not be relied on in any manner as legal, tax, investment, accounting or other advice or as an offer to invest in funds or companies mentioned within this Impact Insights.

Some of the information contained in Impact Insights has been obtained from published sources prepared by other parties and has not been verified independently. Neither ECBF Management GmbH nor any other person assumes any responsibility for the accuracy or completeness of the information contained in this publication, and no representation or warranty, expressed or implied, is made. No reliance should be placed on the fairness, accuracy, completeness, or correctness of this information or opinions contained herein.

Any views expressed in Impact Insights are those of ECBF Management GmbH and are held at the time of preparation of this publication but are subject to change without prior notice. As any forecast, projection, or target where provided is indicative only and not guaranteed in any way, ECBF Management GmbH accepts no liability for any failure to meet such forecast, projection, or target.

**Contact us!**

[www.ecbf.vc](http://www.ecbf.vc)

**ECBF Management GmbH  
Poppelsdorfer Allee 17, 53115  
Bonn (Germany)**

**Sustainable Investing: [Clara.martinez@ecbf.vc](mailto:Clara.martinez@ecbf.vc)**

**Marketing & PR: [Cornelia.mann@ecbf.vc](mailto:Cornelia.mann@ecbf.vc)**

