Regione Lombardia

Lombardy Green Chemistry Association

CIRCULAR INNOVATION:
MATERIALS, TECHNOLOGIES AND CREATIVITY TO REGENERATE THE FUTURE

OSAKA
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CIRCULAR INNOVATION:
Materials, Technologies, and Creativity to Regenerate the Future

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Preface

This **catalogue of company profiles** has been conceived to accompany the workshop *"Circular Innovation: Materials, Technologies, and Creativity to Regenerate the Future"*, promoted by the Directorate-General for Environment and Climate of the **Lombardy Region**[1] and the **Lombardy Green Chemistry Cluster (LGCA)**[2], at the Italian Pavilion of **Expo 2025 Osaka**.
Its primary goal is to provide a **concise yet comprehensive overview** of the business models of the participating companies, illustrating their contributions to the **circular bioeconomy** and to **sustainable innovation**. Each profile contains a description of the company's activities, its positioning within advanced value chains, and **direct contact details with links to further resources**, offering participants an accessible gateway to technologies, solutions, and potential collaborations.
Beyond acting as a directory, this catalogue situates the showcased companies within the **broader context of the European and global bioeconomy**, highlighting Lombardy's role as a pioneer and Japan's consolidation as a worldwide leader in the green transition. Readers are invited to explore the tangible results of innovation—from **bio-based materials for fashion, construction, and packaging** to **circular water management systems and green cosmetic formulations**—and to engage with innovators shaping a regenerative, low-carbon future directly.

Lombardy in the European Circular Bioeconomy

Lombardy stands among Europe's most advanced regions in the **circular bioeconomy**, supported by a dynamic industrial ecosystem deeply oriented toward **sustainable innovation.** According to *La Bioeconomia in Europa 2025*, prepared by the Intesa Sanpaolo Research Department in collaboration with Cluster SPRING and SRM, the Italian bioeconomy generated a production value of **€426.8 billion in 2024**, accounting for **10% of national output** and **7.7% of employment.** Although the sector experienced a modest contraction of 0.4% compared to 2023, it continues to represent a strategic pillar of Italy's economy[3].
Within this national framework, Lombardy remains a **powerhouse of innovation.** The region hosts approximately **40% of Italy's most innovative life sciences companies and healthcare organisations**, attracting around **one-third of national R&D investments** in the pharmaceutical and MedTech sectors, equivalent to **€900 million annually**[4].
In addition, Lombardy's life sciences ecosystem reached a **production value of €84.7 billion in 2024**, with a value added of **€29.8 billion**, confirming the region's leadership in driving industrial competitiveness and knowledge-based growth[5].

International Outlook: Japan's Green Leadership

The workshop is designed to foster structured exchanges between Lombardy and **Japanese stakeholders**, in a moment when Japan is consolidating its global leadership in the green economy.
According to the *Japan Bioeconomy Strategy 2020* (Cabinet Office, Government of Japan), the Japanese bioeconomy has surpassed **100 trillion yen (€650 billion)** in value[6]. Within this framework, **green chemistry** alone generates an estimated **7 trillion yen (€45 billion annually)**, with annual growth rates of 5–7%, as highlighted by JCIA (Japan Chemical Industry Association) and NEDO (New Energy and Industrial Technology Development Organization)[7,8].
Priority growth areas include **bioplastics and bio-based materials** for packaging and automotive, **sustainable cosmetic ingredients** from fermentation and agricultural by-products, **clean catalysis and biomass-based**

1 Directorate-General for Environment and Climate of the Lombardy Region, https://www.regione.lombardia.it/wps/portal/istituzionale/HP/istituzione/direzioni-generali/direzione-generale-ambiente-e-clima
2 Lombardy Green Chemistry Association (LGCA), www.chmicaverdelombardia.it
3 Intesa Sanpaolo Research Department, Cluster SPRING, SRM. *La Bioeconomia in Europa 2025*. Milano: Intesa Sanpaolo; 2025, https://group.intesasanpaolo.com/content/dam/portalgroup/repository-documenti/research/it/bioeconomia/2025/Bioeconomia_giugno_2025_finale.pdf
4 Invest in Lombardy Blog. *Life Sciences: a key sector in Lombardy*. Invest in Lombardy; 2023 Nov, https://www.investinlombardyblog.com/en/2023/11/life-sciences-a-key-sector-in-lombardy/
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7 Japan Chemical Industry Association (JCIA). Annual Reports and Industry Data. Tokyo: JCIA; 2024, https://www.nikkakyo.org
8 New Energy and Industrial Technology Development Organization (NEDO). Innovation and Project Financing Programs. Kawasaki: NEDO; 2024, https://www.nedo.go.jp

synthesis, and **technologies for green hydrogen and ammonia production**. Japan also demonstrates world-leading innovation capacity, filing **over 1,000 patents per year** in environmental chemistry, and boasts a robust network of industrial players (Sumitomo Chemical, Asahi Kasei, Toray, Mitsui Chemicals), clusters such as JBA (Japan Bioindustry Association) and JCTC, and agencies like NEDO that actively fund pilot and industrial-scale projects.

Priority areas of expansion include **bioplastics and bio-based materials** for packaging and the automotive sector, **sustainable cosmetic ingredients** derived from fermentation and agricultural by-products, clean **catalysis and biomass-based synthesis**, and emerging technologies for **green hydrogen** and **ammonia production**. Japan also shows remarkable innovative capacity, with over 1,000 environmental chemistry patents filed annually. This performance is supported by an extensive network of industrial leaders such as Sumitomo Chemical, Asahi Kasei, Toray, and Mitsui Chemicals, technology clusters such as the Japan Bioindustry Association (JBA) and the Japan Chemical Technology Consortium (JCTC), and agencies like NEDO, which fund pilot and industrial-scale projects[9,10].

A Platform for Dialogue and Collaboration

Against this backdrop, the workshop and the accompanying catalogue provide a **strategic platform for cross-fertilisation** between two complementary ecosystems—Lombardy and Japan. By connecting public policies, research institutions, SMEs, and large industrial groups, the initiative seeks to create new synergies that strengthen global value chains.

The program is structured around three interconnected thematic panels:

- **Circular Economy and Regenerative Materials**, exploring the potential of bio-based solutions and waste-to-resource technologies.
- **Sustainable Management of Water and Energy**, addressing the integrated use of natural resources, reuse technologies, and renewable energy.
- **Circular Well-being in Cosmetics and Nutraceuticals**, highlighting how biotechnology, plant-derived ingredients, and sustainable processes are reshaping the concepts of health and wellness.

Through this framework, the workshop showcases **both conceptual visions and practical industrial case studies**, offering participants replicable ideas, scalable technologies, and opportunities for collaboration.

9 Japan Bioindustry Association (JBA). *Activities and Cluster Network. Tokyo:* JBA; 2024, https://www.jba.or.jp
10 Japan Chemical Technology Consortium (JCTC). *Consortium Activities and Innovation Support.* Tokyo: JCTC; 2024.

Bict S.r.l.

WHERE NATURE MEETS TECHNOLOGY

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Introduction & Mission

BiCT S.r.l. — short for *Biological and Chemical Technologies* — is an Italian biotechnology company founded in 2009, headquartered in Villanova del Sillaro (Lodi, Lombardy). Since its inception, BiCT has embodied the synergy between nature and science, positioning itself as a leading innovator in the development of bioprocesses and bio-based products for the pharmaceutical, cosmetic, nutraceutical, veterinary, and agroindustry sectors.
The company is driven by a vision of biotechnology and sustainability evolving hand in hand. Its mission is to design and deliver products and processes that enhance human, animal, and planetary health, ensuring that scientific progress translates into scalable, low-impact technologies integrated into everyday life. For BiCT, innovation, sustainability, and ethical excellence are not simply values but the very DNA of its operations, guiding decision-making, R&D priorities, and partnerships.

Core Capabilities & Service Areas

BiCT offers a wide spectrum of R&D and production services, structured across three specialised divisions. This multidisciplinary structure allows the company to respond flexibly to diverse market needs while ensuring high scientific rigor and industrial scalability.

Bioindustry Innovation
This division develops competitive, sustainable industrial processes, supporting companies in adopting bio-based production pathways. Areas of expertise include:

- Enzymatic and chemo-enzymatic processes for cleaner, greener synthesis routes.
- Fermentation systems for the large-scale production of metabolites and active ingredients.
- Enzyme immobilisation and purification technologies to maximise efficiency and reduce waste.
- Strain development, bioconversion, and heterologous expression, enabling new functions in industrial microbes.
- Mutagenesis and enzyme evolution, unlocking enhanced performance for industrial enzymes.

Thanks to high-throughput screening and advanced process design capabilities, BiCT makes cutting-edge bioprocesses accessible at industrial scale, helping companies reduce costs while meeting sustainability and regulatory standards.

Personal Care & Medical Devices
In the cosmetics and medical devices sector, BiCT translates biotechnology into safe, high-performance, and sustainable innovations. Its R&D services focus on the discovery, validation, and testing of advanced bioactive ingredients designed to improve skin health, protection, and regeneration.
BiCT's flagship cosmetic ingredients are:

- **Lactive™**, a patented, bioactivated lactoferrin-based powder. Inspired by the natural enzymatic process of newborns, Lactive™ generates synergistic peptides from lactoferrin, enhancing the body's natural defences. It demonstrates broad and proven activities — anti-aging, brightening, antioxidant, anti-inflammatory, regenerative, antimicrobial, antifungal, antiviral, and anti-biofilm. Lactive™ is positioned as a premium ingredient for skincare, oral care, intimate care, and advanced cosmetic formulations.
- **Evobiom™**, a vegan postbiotic obtained through the upcycling of a side-stream from the probiotic *Lacticaseibacillus rhamnosus* HN001. Evobiom™ combines sustainability and ethical positioning with proven efficacy in supporting skin barrier integrity, balance, and protection.

These ingredients exemplify BiCT's ability to deliver scientifically validated, sustainable alternatives to conventional cosmetic ingredients, aligning with growing consumer demand for natural and safe solutions.
BiCT is actively seeking international distributors for Lactive™ and Evobiom™ to expand their global reach and support their integration into high-value cosmetic formulations.

Food Supplements

In the nutraceutical sector, BiCT contributes through scientific research to innovation and the development of advanced health solutions. The company conducts studies and experimental activities across a broad spectrum of topics, ranging from microbiome balance and cholesterol regulation to the evaluation of innovative approaches for conditions such as Irritable Bowel Syndrome (IBS), atopic dermatitis, as well as metabolic and inflammatory disorders. A distinctive element is its highly qualified experimental support, which includes microbiological efficacy testing and studies on complex cellular models, ensuring robust results that can be effectively transferred to industrial applications. Notable projects, such as InnoFeed, Scida, and Probiotika, highlight BiCT's commitment to harnessing bioactive compounds and biotechnological processes, thereby transforming research into sustainable and scientifically validated innovations.

Automation & Innovation Tools

At the heart of BiCT's laboratory is A.L.E.X. (Automatic Leverage of Excellence), an advanced automation system that enables high-throughput screening in molecular biology, purification, and biocatalysis workflows. This technology allows BiCT to rapidly scale up experimental protocols, increasing both the speed and efficiency of R&D. A.L.E.X. represents BiCT's commitment to automation and digital innovation, ensuring that discoveries in the lab can be translated into industrial applications with minimal friction.

Quality, Infrastructure, and Certifications

BiCT operates within a state-of-the-art 3,600-square-meter R&D and production facility located near Lodi. The site is designed to support both laboratory research and industrial-scale production, ensuring continuity from concept development to market-ready outputs.

All operations are conducted under ISO 9001 (quality management) and ISO 14001 (environmental management) certifications, in addition to HACCP protocols for food safety and compliance with EU animal health regulations (Regulation 183/2005 and Regulation 1069/2009). Each process is designed to be controlled, reproducible, and scalable, ensuring that partners and clients can rely on BiCT as a trusted partner in industrial biotechnology.

Innovation Culture & Growth

Since its inception, BiCT has fostered a strong culture of innovation. The company was among the first in Italy to adopt automation technologies, enabling the rapid translation of laboratory protocols into industrial bioprocesses. This pioneering approach led to the successful commercialisation of enzymatic hydrolysates and fermentation-derived products, including the launch of Lactive™ and Evobiom as flagship cosmetic innovations.

Today, BiCT employs a growing team of professionals, including researchers, process engineers, and technical specialists. Their expertise spans the full biotechnology value chain, enabling the company to support clients with solutions that combine scientific depth and industrial pragmatism. The company continues to invest in talent development, interdisciplinary collaboration, and international partnerships, reinforcing its role as a driver of innovation for health, environment, and sustainability.

Scale & Impact

BiCT's impact is reflected in its business growth and adaptability. With a workforce of 13 employees in 2025 and a turnover of approximately €1.63 million in 2023, the company demonstrates both agility and resilience in the competitive biotech sector.

Its flexible structure allows BiCT to support partners at every stage of the innovation journey: from early feasibility studies and technical due diligence to process optimisation, scale-up, and technology transfer. This end-to-end approach ensures that innovations are not only scientifically robust but also market-ready and economically viable.

LEARN MORE ABOUT BICT S.R.L.

Italbiotec S.r.l.

TURNING IDEAS INTO SUSTAINABLE INNOVATION

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Introduction & Mission

Italbiotec S.r.l. is a Benefit Corporation and Innovative SME based in Milan, Italy, founded in 2021 to transform research into tangible innovation, accelerating the transition to a sustainable and competitive economy. Building on the scientific heritage of Consorzio Italbiotec (active since 1998), the company combines a solid research expertise with an agile, business-oriented approach. Its mission is to convert research outputs into products, services, and market-ready solutions, supporting companies in the healthcare, agri-food, and bioeconomy sectors while ensuring that innovation creates economic, environmental, and social value.
As a Benefit Corporation (Società Benefit), Italbiotec integrates sustainability into governance, balancing profit and purpose. Its annual impact report highlights ESG achievements, including initiatives focused on gender equality, low-carbon strategies, and circular economy approaches. The long-term vision is to strengthen Italy and Europe's role as leaders in biotechnology-driven sustainable growth.

Core Services & Expertise

Italbiotec offers an integrated portfolio of consultancy services designed to support companies, startups, universities, and public authorities in transforming innovative ideas into market-ready solutions.
The approach is end-to-end, covering every step from early-stage concept validation to scale-up and international exploitation.

- **Innovation & Technology Transfer Management**
  Italbiotec provides technical and strategic consultancy to strengthen competitiveness and resilience in innovation. Its integrated approach focuses on derisking and increasing the survival rate of innovation projects, regardless of whether they are startup projects or internal corporate innovation endeavours. Services include IP landscaping and FTO analysis, market intelligence, technology scouting, technology road mapping, business planning, technical due diligence, and financial feasibility assessments.
  It boasts in-house expertise in top engineering for managing scale-up projects and conducting techno-economic analyses (TEA) of biobased and green chemistry processes. TEA is used to generate industrial-like data for CAPEX and OPEX calculations, as well as investment decision-making. Particular expertise lies in Life Cycle Assessment (LCA) and socio-LCA, enabling clients to quantify and reduce the environmental and social impacts of products, processes, and value chains. This approach ensures innovation pathways that are not only technologically advanced but also aligned with sustainability goals and regulatory frameworks.
- **EU Funding, Grants & Proposal Development**
  With a strong track record in European R&I programmes, Italbiotec supports organisations in securing and managing public funding at regional, national, and EU levels. Services include call scouting, consortium building, proposal drafting, and submission, ensuring compliance with funding rules. Italbiotec also manages administrative and financial aspects across the project lifecycle, from audits to impact reporting. Success spans Horizon Europe, LIFE, COSME, PRIMA, and structural funds, securing millions for partners in life sciences, agri-food, and bioeconomy innovation.
- **Marketing, Training & Communication**
  Italbiotec believes innovation achieves its full potential when shared and understood. The company designs integrated communication strategies, from brand positioning to dissemination campaigns, boosting visibility across scientific, industrial, and policy arenas. Activities include stakeholder engagement, social media management, and media relations, generating over 1,500 media impacts annually.

In parallel, Italbiotec develops training programmes and e-learning platforms on biotech entrepreneurship, project management, sustainability, and ESG reporting. Tailored courses, workshops, and capacity-building sessions equip professionals, researchers, and students with skills to thrive in the evolving bioeconomy.

Project Impact & Funding Success

Italbiotec S.r.l. engages in high-impact scientific and technological projects at both national and international levels. Collaborating with universities, research centers, companies, and public institutions, the company focuses on advancing the bioeconomy, industrial biotechnology, environmental sustainability, and ecological transition. Core objectives across all projects include:

- Generating applied and transferable knowledge
- Promoting green technologies and circular processes
- Creating positive impacts on businesses, regions, and the scientific community
- Enhancing internal competencies and overall innovation capacity.

Among the notable projects are:

- REPURPOSE – Development of infinitely recyclable, multifunctional materials from local plastic waste, combining biocarbon and advanced polymer design.
- RESTART – Valorisation of plant-based food waste following circular economy principles.
- SEAREFINERY – Creating value from marine resources and processing residues for efficient food/feed production and development of sustainable materials.
- SMART WATER – NODES – Introducing advanced water reuse technologies in the textile sector of Northwest Italy.
- SWOT – Lazio Innova – Tackling pharmaceutical industrial wastewater challenges with sustainable, flexible treatment systems.
- LINEA SVILUPPO AZIENDALE – Italbiotec's internal development plan to strengthen its innovation infrastructure and capabilities.

A highlighted innovation in Italbiotec's project landscape is V-Rotex, a patented reactor technology initially developed for wastewater treatment but with broad applicability to biotechnological processes.
V-Rotex combines Moving Bed Biofilm Reactor (MBBR) and biodisc technologies within a proprietary geometry, significantly enhancing gas–liquid mass transfer efficiency. Its proprietary engineered flow path increases bubble residence time, which translates into:

- Up to 50% reduction in energy consumption
- 80% less air usage
- Significantly lower sludge output

Praised for its modularity and cost-effectiveness, V-Rotex adapts easily to existing tanks and basins, minimising space requirements and necessary civil works—making it ideal across multiple sectors and applications.
Italbiotec holds the global exclusive license for this patented technology and is actively advancing it through pilot testing. A 6 m³ mobile prototype has already demonstrated a 42% energy reduction in aerobic wastewater treatment, with a Technology Readiness Level (TRL) nearing 8, on three different industrial sites. The next step involves additional pilot tests on different industrial wastewaters, and the development of a larger 10 m³ demo to validate industrial performance.

Strategic Outlook

Looking ahead, Italbiotec aims to consolidate its role as a European leader in sustainable biotech innovation by:

- Expanding its service portfolio in green chemistry and biobased materials, responding to the EU Green Deal and
- Chemicals Strategy for Sustainability.
- Scaling its digital innovation platforms to integrate AI-based formulation tools, blockchain-enabled traceability, and smart circularity metrics.
- Strengthening its international presence, opening new operational hubs in strategic European regions.
- Attracting and nurturing talent, ensuring diversity, gender equality, and inclusion across its teams.

LEARN MORE ABOUT ITALBIOTEC S.R.L.

Montecolino S.p.A.

WEAVING INNOVATION WITH TRADITION

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A Legacy Rooted in Quality

Montecolino is a European leader in the production of textile flooring and wall coverings. It takes its name from the promontory of the same name on Lake Iseo, where its history began in 1971.Since its inception, the company has stood out for its ability to combine textile tradition with technological innovation, gradually establishing itself as a European reference point in the sector of textile coverings for floors and walls.
Today, Montecolino operates on a site of over 120,000 m², featuring a production plant of 54,000 m² and an annual production capacity of 15 million m² of technical textiles. More than 3,000 active customers rely every year on its products, which are used in fields ranging from construction to retail, from automotive to marine industries, and in exhibitions and events. After years in which carpeting was a must in interior design, the company undertook a strategic evolution, specialising in the trade fair and events sector. Its products have been used in some of the most prestigious international venues, including: America's Cup, Cannes Film Festival, Fiera Milano, Fira Barcelona, Formula 1, Giro d'Italia, Winter Olympic Games, MotoGP, Roland Garros, Salone del Mobile in Milan, Fiera Guadalajara and the fashion shows of the most important fashion houses.

Philosophy

Montecolino's success is based on an integrated production cycle, advanced technology, and rigorous quality control, combined with a strong commitment to environmental responsibility. Recycling and circular economy principles are central to its vision, reducing waste and promoting sustainable solutions. Each product balances aesthetics, performance, and respect for the environment, reflecting the company's belief that innovation must build a greener future.

Production Excellence & Service Flexibility

One of Montecolino's greatest strengths lies in its vertically integrated production cycle, which encompasses every stage of the process—from the careful selection of raw materials to the final finishing of the product. This structure allows the company to maintain complete control over quality, sustainability, and efficiency, while ensuring constant innovation. At the heart of this system is an internal research and development laboratory, where new products and processes are conceived and tested. Montecolino also designs and engineers part of its production machinery in-house, a capability that is rare in the industry and which guarantees the company unique technical know-how and differentiation in the market. This continuous capacity for innovation translates into products with superior performance and tailor-made characteristics that are difficult to replicate elsewhere.
Another hallmark of Montecolino is its exceptional service flexibility. The company has built its reputation on the ability to respond quickly to highly specific client requirements, offering processes such as cut-to-size operations, edging, rubber coating, and personalized printing. Thanks to this adaptability, Montecolino can provide both standardized solutions for large-volume orders and bespoke services for small batches—even down to a single unit—without compromising on quality or delivery times. This flexibility makes Montecolino an ideal partner not only for large industrial clients but also for architects, designers, and event organisers seeking unique, one-off solutions.
Supporting this production and service model is a robust logistics network. Montecolino's operations are anchored by a central warehouse in Provaglio d'Iseo, strategically complemented by storage facilities in Milan and Valencia.
This distribution infrastructure enables the company to guarantee fast and reliable deliveries, reduce transportation costs, and maintain emergency stock availability. Such capabilities are particularly valuable during seasonal peaks and high-demand periods, for example around international trade fairs, large-scale events, or urgent retail campaigns, where rapid response is critical. By combining industrial-scale capacity with logistical agility, Montecolino ensures that its clients benefit from a reliable supply chain that is both resilient and responsive to market dynamics.

Diverse Product Portfolio

Montecolino offers a catalogue of more than **300 products**, designed to meet diverse needs:

- **Carpets and rugs** in rolls, available in various designs and dimensions.
- **Synthetic grass** for decorative or temporary outdoor installations.
- **Needle-punched textiles**, widely used in automotive, contract, and exhibition settings.
- **Wall coverings**, including the innovative **WÈP WallECOpanel**, a sustainable and versatile solution.
- **Functional mats**, such as doormats, runners, and high-performance technical textiles.
- **Specialty products**, including solutions for the healthcare sector, automotive applications, and event design.

This diverse portfolio enables Montecolino to cater to both large industrial projects and bespoke, design-driven needs in retail and events.

Sustainability & Circular Practices

Montecolino embraced circular economy principles early on. Since 2017, the montECOlino Recycling Carpet project has recovered post-consumer waste, especially exhibition carpets, transforming them into new raw materials. The company obtained ecological certification in 2018 and, in 2025, reached a major milestone with Cradle to Cradle certification for selected exhibition textiles—proof of its dedication to eco-design, safety, and recyclability.

Innovation & Market Leadership

Innovation is central to Montecolino's strategy. Its R&D team develops advanced technical textiles and proprietary processes, while in-house machinery design ensures unique products and market differentiation. Membership in ELITE, Euronext's growth platform, provides international visibility, strategic networks, and resources for expansion.

Strategic Growth & Acquisitions

Montecolino has strengthened its position through acquisitions. In 2022, it acquired Klamoo S.r.l., a brand specializing in Made in Italy bespoke wallpapers, enriching its interior design and hospitality offer while working on recycled product lines. In 2023, it expanded further with Topcolor, specializing in 3D printing with secondary raw materials, large-format digital printing, scenography, and visual communication. In June 2025, Montecolino launched a project enabling 3D printing from recycled materials, producing structural components, WÈP panels, and furnishing elements such as sculptures and exhibition totems.

Future Outlook

Montecolino's strategy is to consolidate its leadership in technical textiles through continuous innovation, sustainability, and tailor-made services. The integration of Klamoo and Topcolor, alongside steady R&D investment, will expand its portfolio to provide 360-degree solutions—covering everything from textile coverings to interior design, retail, and event installations—making Montecolino a trusted partner for architects, designers, industries, and international events.

LEARN MORE ABOUT MONTECOLINO S.P.A.

ROELMI HPC

INNOVATION MEETS SUSTAINABILITY IN HEALTH & PERSONAL CARE

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Introduction & Identity

ROELMI HPC, headquartered in Origgio (VA), Italy, is a leading provider of high-performance active and functional ingredients for the Health & Personal Care and Nutraceutical markets. Drawing on the principles of green chemistry and circular economy, the company designs, develops, and manufactures cutting-edge ingredients that elevate product performance while minimizing environmental impact. Its operations are deeply imbued with quality, passion, and scientifically founded innovation.

Mission & Sustainable Philosophy

ROELMI HPC operates under the "NATURE IS PEOPLE® (NIP)" program, a philosophy grounded in quality, efficacy, human safety, and environmental preservation. This voluntary program underscores the company's commitment to developing ingredients that achieve professional-grade results without compromising ethical or ecological standards.
In alignment with this vision, the company has formally embraced the Benefit Corporation model in 2024. This strategic decision reflects its deep dedication to balancing profit with social and environmental responsibility, fully embracing the Italian and global Sustainable Development Goals (SDG 12).
ROELMI HPC's sustainability excellence has earned it the prestigious Gold CSR rating from EcoVadis—one of the highest achievements in corporate social responsibility.

Research & Innovation Focus

The company stands out for its biotech and green chemistry-driven innovation, particularly in biofermentation and the upcycling of industrial and food-chain by-products. These circular processes not only reduce waste, but also foster sustainable ingredient development.
Two newly launched subsidiaries bolster its innovation infrastructure:

- ROELMI BIOTECH: Focuses on precision microbial fermentations and adds value to industrial by-products through sustainable techniques.
- ROELMI BOTANICALS: Leverages the botanical biodiversity to produce premium extracts using a circular economy approach and low-impact extraction methods.

Certified Excellence

ROELMI HPC holds ISO 9001:2015 certification for its design, research, development, and commercialization of ingredients and finished formulations in Health & Personal Care, Nutraceuticals, and Medical Devices. This certification extends across its Italian and international sites, including France, Korea, USA, and China—valid through November 2026.
Other ISO certifications are: ISO 14001:2015, ISO 45001:2018, ISO 22716:2007 and ISO 22000:2018.

Product Innovation & Market Presence

As a global innovation leader, ROELMI HPC has built a reputation for delivering a diverse and forward-looking portfolio of proprietary technologies and formulations that combine scientific excellence, sustainability, and consumer-oriented performance. Each line is designed to address specific market needs while remaining faithful to the company's philosophy of green chemistry and circular economy.

- **ExceptionHYAL® and PrincipHYAL® (Hyaluronans 2.0)**
  This next-generation range of hyaluronic acids offers a complete spectrum of molecular weights, carefully selected through a biological activity screening. Unlike standard hyaluronic acid products, ExceptionHYAL® and PrincipHYAL® are tailored to interact with biological pathways in a targeted way, as naturally occurs in human body. Their versatility makes them a benchmark solution across skincare, nutraceuticals, and medical applications, delivering measurable efficacy with scientifically proven results.
- **SelectSIEVE® line**
  Developed from Mediterranean botanical matrices, the SelectSIEVE® range reflects ROELMI HPC's commitment to combining nutraceutical performance with ecological responsibility. Extracted via eco-sustainable technologies, these actives preserve the natural richness of raw materials while ensuring reproducibility and stability. SelectSIEVE® ingredients are widely applied in nutraceuticals and functional foods, offering solutions for metabolic balance, digestive wellness, and cardiovascular health, all while celebrating the biodiversity of the Mediterranean.
- **Beaulixir®**
  Positioned as a breakthrough in oral supplementation, Beaulixir® leverages endogenous molecules to promote hair beauty without the side effects often linked to drugs approaches. This ingredient represents a natural and safe alternative for consumers seeking holistic solutions to improve hair quality, physiology, and overall well-being. Its design embodies ROELMI HPC's philosophy of using science to elevate natural potential while safeguarding long-term consumer safety.
- **EquiBiotics® LA**
  A cutting-edge post-biotic ingredient derived from Lactobacillus acidophilus PBS066, EquiBiotics® LA is engineered to strengthen the skin barrier, modulate inflammation, and balance the skin microbiota. This makes it particularly effective for sensitive, stressed, or reactive skin types, responding to the growing consumer demand for microbiome-friendly skincare. Its inclusion in formulations supports dermocosmetic innovation, offering both preventive and restorative benefits aligned with the latest scientific findings on the role of the microbiota in skin health.
- **CytoFruit® Biologically Active Waters**
  An innovative solution for sustainable cosmetics, CytoFruit® can replace demineralized water in formulations with active waters derived from fruit by-products processing. By valorizing what would otherwise be an industrial by-product, this line ensures zero competition with drinkable water sources. Beyond sustainability, CytoFruit® waters deliver additional functional benefits, positioning them as an active ingredient in themselves rather than a simple carrier. This approach reflects ROELMI HPC's circular vision, where waste streams are transformed into value.

Recent Strategic Developments

- **Expansion:** ROELMI HPC launched two new products plant — ROELMI Biotech and ROELMI Botanicals— enhancing its R&D in biofermentation and green chemistry capabilities, respectively.
- **Corporate Integration:** As of January 2025, **BRASCA** operations have been merged into ROELMI HPC. This merger enriches the group's portfolio with additional ingredients and technologies across Health & Personal Care and Cosmetics.

LEARN MORE ABOUT ROELMI HPC

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SMART LAND, SMART FUTURE

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Introduction & Mission

Simbiosi is Italy's first Resources Service Company (Re.S.Co.®), a pioneering model that blends technological innovation, environmental responsibility, and economic performance. Founded to support companies, utilities, landowners, and territories in their transition towards sustainable and efficient resource management, Simbiosi provides integrated solutions that recover and valorise resources— not only minimizing waste, but transforming it into new value for energy, water, and soil. With its multidisciplinary expertise, the company develops tailor-made projects that combine AI-powered technologies, nature-based solutions, and innovative financing schemes. Its mission is clear: to create resilient, biodiverse, and resource-efficient ecosystems that benefit both industry and society.

Simbiosi's mission is to reduce consumption, cut waste, and maximise the value of every resource turning environmental challenges into opportunities. The company envisions a future where smart territories operate like balanced ecosystems, where energy, water, and natural resources are managed intelligently, regeneratively and in a circular manner.

Its vision is embodied in the Smart Land model, which integrates infrastructure, digitalisation, and ecological design to achieve measurable improvements in resilience, resource efficiency, biodiversity, and quality of life for communities.

Smart Land Model & Nature-Based Solutions

At the core of Simbiosi's methodology lies the Smart Land approach, a holistic and systemic strategy that reimagines territories as interconnected ecosystems rather than fragmented industrial or urban sites. The model integrates multiple infrastructures—such as district heating networks, phytodepuration systems, constructed wetlands, renewable energy plants, and biodiversity corridors—into a unified territorial vision, where resources are managed in a circular, efficient, and resilient way.

By acting directly on utilities and industrial sites, Smart Land improves energy and resource efficiency, while enabling waste recovery and turning it into value for both industry and the environment. Constructed wetlands, for example, not only restore ecological balance but also recover water for reuse in agriculture and production, closing the loop between natural and industrial cycles.

Applying Nature-Based Solutions (NBS), Simbiosi not only restores ecological balance but also generates tangible benefits in terms of climate adaptation and mitigation. These include improving air quality through reforestation and vegetative barriers, enhancing water quality via wetlands and phytodepuration systems, and regenerating soil health through natural cycles of filtration and depollution. Such interventions reduce heat island effects, regulate microclimates, and provide resilience against extreme weather events, directly supporting territorial adaptation to climate change.

Beyond environmental performance, the Smart Land model creates a new narrative of sustainability that strengthens the social license to operate. Companies adopting these solutions improve their public image, engage positively with local communities, and position themselves as pioneers in sustainable industrial ecology. This combination of ecological, economic, and social benefits makes Smart Land not just an environmental program, but a strategic asset for long-term competitiveness and resilience.

High-Tech Solutions: AI-Family and ADAM & EVA

Simbiosi also develops and applies advanced AI-based technologies to optimize resource management and industrial processes. Its proprietary suite, the AI-Family, leverages digital twin technology and predictive analytics to maximize efficiency and reduce environmental impact.

- **AI-Chiller:** A cutting-edge industrial chiller that eliminates the use of glycol or ammonia, reducing operational risks and energy demand.

- **AI-Coge:** An intelligent cogeneration system delivering both heat and power, optimized through AI for demand-response efficiency.
- **AI-Trige & AI-Tower:** Solutions integrating trigeneration, cooling towers, and heat recovery to enhance energy performance.

Complementing this is **ADAM & EVA**, an advanced software ecosystem that combines artificial intelligence and digital twins to simulate, monitor, and optimize processes across energy, water, and environmental systems. This technology enables predictive management, ensuring resilience, cost savings, and regulatory compliance.

Operational Model: From Design to Results

Simbiosi operates under the Resources Performance Contract (Re.S.Co.®), a unique financial model that aligns the company's remuneration with the actual performance of its solutions. This means clients do not bear upfront investment risks: Simbiosi designs, implements, and manages the project, sharing in the economic savings generated.
By functioning as both a Resources Service Company and an Energy Service Company (ESCo), Simbiosi covers the entire innovation chain: from feasibility analysis and engineering to installation, digital integration, and long-term operation. This results-oriented approach ensures measurable environmental and economic benefits.

Case Studies & Real-World Impact

- Fedegari Group
  Simbiosi applied its Smart Land model to Fedegari's industrial site, introducing renewable energy, floating photovoltaics, and AI-based optimization tools. The project increased biodiversity, reduced carbon emissions, and improved the site's climate resilience, making Fedegari a benchmark for sustainable manufacturing.
- Granarolo (Pasturago di Vernate)
  At Granarolo's facilities, Simbiosi implemented AI-Family solutions and resource management systems, significantly improving energy efficiency, operational continuity, and sustainability. The initiative strengthened Granarolo's environmental positioning while ensuring cost savings and resilience.

These projects demonstrate Simbiosi's ability to integrate advanced technology and ecological design in real industrial contexts, achieving results that are both measurable and replicable.

Smush Materials S.r.l.

PACKAGING THAT DISAPPEARS, NATURALLY

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Introduction & Mission

Smush Materials S.r.l. is an Italian startup founded in 2021, with headquarters in Milan and an operational hub in Giussago (Pavia), in the heart of one of Europe's largest rice production districts. Smush's mission is straightforward yet transformative: to provide the market with high-performance, eco-friendly packaging solutions that deliver the same (or better) protection and durability as plastic foams while ensuring full compostability at the end of life.
Its vision is to accelerate the global transition towards a circular bioeconomy, in which agricultural waste streams are upcycled into high-value products. By transforming rice husks and other crop residues into functional biomaterials, Smush not only reduces landfill and incineration of by-products but also contributes to lowering CO_2 emissions across industrial supply chains.
The company's motto could be summarised as: "Packaging that disappears, naturally."

Technology & Innovation

The core of Smush's innovation lies in the natural binding properties of fungal mycelium, the underground root system of mushrooms. Agricultural residues are sterilised, inoculated with fungal spores, and placed into moulds where the mycelium grows, weaving through the biomass and binding it together. After a period of controlled incubation, the product is dried and heat-treated to stabilise its shape and properties.
The result is a lightweight, robust, and 100% compostable material that matches or surpasses polystyrene in many key areas:

- Mechanical resistance: greater shock absorption and strength than EPS.
- Thermal resistance: stable under variable temperatures.
- Antimicrobial properties: inherent to mycelium, reducing risks of contamination.
- Fire safety: naturally self-extinguishing, a crucial factor in logistics and industrial use.
- Water repellence: suitable for packaging that faces humidity during transport.

Compared to polystyrene, Smush's material offers a CO_2 reduction of up to 90% during production. It allows companies to cut disposal costs by 80%, as it can be industrially composted without generating harmful residues.

Products & Applications

Smush Materials offers a dual portfolio of standardised packaging elements and custom-designed solutions.
Standard products include:

- **Corners and dividers**, protecting edges and separating items.
- **Blocks and sheets**, providing structural stability.
- **Filler chips**, adaptable for filling voids in packaging.
- **Bottle and jar holders**, molded to secure cylindrical containers.

Custom solutions are designed in close collaboration with clients, leveraging Smush's material science and design expertise to create packaging that aligns with specific product dimensions, branding requirements, and supply chain logistics.
Target sectors include:

- Automotive components
- Electronics and household appliances
- Cosmetics and pharmaceuticals
- High-end furniture and design objects
- Food and beverage logistics

In all these markets, Smush offers companies the opportunity to replace single-use plastics with compostable solutions that do not compromise on functionality or customer experience.

Circular Value Chain & Sustainability

Smush embodies the principles of the circular economy at every stage of its value chain. The raw material base consists of local agricultural residues, which reduces transportation emissions and supports regional farming communities. By valorising by-products streams from local cultivation, the company helps close resource loops in one of Italy's most strategic agricultural districts.
The production process itself is low-energy and solvent-free, avoiding harmful chemicals and generating no hazardous waste. At the end of life, Smush packaging can be disposed of in organic waste streams, returning safely to the soil as compost or fertiliser.
This approach ensures traceability, transparency, and measurable sustainability impacts, making Smush a credible partner for businesses seeking to meet ESG goals and comply with European directives on single-use plastics.

Recognition & Funding

Despite being a young company, Smush has already attracted significant recognition:

- Winner of StartCup Lombardia (2024) in the sustainability category.
- Recipient of the GoBeyond Call for Ideas (2024) promoted by Sisal, supporting early-stage innovation.
- Participation in leading incubation and acceleration programs, including PoliHub (Politecnico di Milano) and Terra Next, an ecosystem supported by CDP Venture Capital and Cariplo Factory.
- In April 2025, Smush closed a €1 million pre-seed funding round, with backing from CDP Venture Capital's Tech4Planet fund and other strategic investors, enabling the development of a demo plant and laying the groundwork for industrial scaling.

These achievements highlight Smush's strong credibility within both the startup ecosystem and the sustainability innovation landscape.

Roadmap & Outlook

Smush is currently focused on:

- Scaling production with a demo plant by the end of 2025, followed by a full industrial pilot facility.
- Expanding the team, bringing together expertise in engineering, materials science, and business development.
- Building partnerships with leading companies across automotive, design, and consumer goods sectors.
- Conducting pilot projects with early adopters to validate performance and accelerate market penetration.

The medium-term goal is to position Smush as a European reference player for mycelium-based packaging, with the long-term ambition of diversifying applications into construction materials, insulation, and other bio-based solutions.

LEARN MORE ABOUT SMUSH MATERIALS S.R.L.

The Blue Planet S.p.A.

AIRLITE® – THE PAINT THAT WORKS LIKE A TREE

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Introduction & Mission

Founded in Milan in 2013, Airlite® of The Blue Planet S.p.A. was born from a visionary idea: to transform ordinary walls into active agents of environmental protection and human well-being.
Its mission is to redefine paint not as a decorative finish, but as an intelligent, zero-energy technology capable of purifying air, eliminating pathogens, saving energy, and reducing climate impact. With roots in Italian innovation, Airlite® is today recognised as one of the most promising cleantech solutions worldwide.

The Technology

At the heart of Airlite® lies a photocatalytic mineral paint that leverages titanium dioxide.
When activated by natural or artificial light, the painted surface generates negative ions that trigger powerful oxidative reactions. These reactions:

- Neutralise air pollutants such as nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), and fine particulates (PM10, PM2.5).
- Eliminate pathogens (bacteria, mould, fungi, and viruses, including coronaviruses), with proven efficacy of over 99% microbial reduction within minutes.
- Break down odours and harmful gases, ensuring cleaner and healthier indoor environments.
- Reduce energy demand, as the reflective properties of the coating lower building heat absorption, cutting cooling needs by up to 30% and lowering CO_2 emissions by as much as 80%.

The outcome: walls and surfaces that function like a natural air purifier, continuously and passively, with no energy consumption and minimal maintenance.

Products Portfolio

- **Airlite® Professional (Liquid)**
  A high-performance, solvent-free and formaldehyde-free liquid paint. It ensures high opacity, whiteness, and washability, making it particularly suited for healthcare facilities, schools, and high-traffic environments. Airlite® Professional provides long-lasting antibacterial and antiviral protection. With pollutant reduction of up to 88%, it complies with international building sustainability standards, including LEED, WELL, BREEAM, and CAM.
- **Airlite® Premium (Powder)**
  This mineral-based, VOC-free powder paint is breathable, sustainable, and easy to mix with water, providing up to 180 vibrant colours. The Premium added value: it absorbs CO2 in the first month after application through the carbonation process and consistently avoids emitting more than 80% of the CO2 that any other traditional paint.
- **Exterior Applications**
  Applied outdoors, Airlite® transforms facades and urban surfaces into pollution-absorbing skins. Tests show that 100 m² painted with Airlite® equals the effect of 100 m² of mature forest, making it a scalable and effective solution for smog reduction in cities.
- **Smart Coatings for Architecture & Design**
  Beyond traditional walls, Airlite® can be applied to diverse substrates, including concrete, drywall, metal, wood, and even roofs. Used in eco-murals, tunnels, public infrastructures, and flagship architecture projects, Airlite® merges aesthetics with functionality, contributing to healthier and more sustainable urban environments.

Sustainability & Certifications

Airlite®'s innovation is anchored in sustainability. The paint is produced in Ticino, Switzerland, at a solar-powered facility that incorporates automation and utilises up to 40% recycled raw materials. This commitment extends across the product's entire lifecycle, ensuring a minimal environmental footprint.
Internationally recognised certifications validate its quality and impact:

- B Corp: Certified as a company balancing profit and purpose.
- Cradle to Cradle Gold: Recognising circularity and safety of materials.
- Green Seal and VOC-Free Certification: Guaranteeing air quality and user health.
- Environmental Product Declarations (EPD): Transparent reporting of sustainability performance.

Applications & Case Studies

Airlite® has been adopted in a wide range of projects worldwide:

- Public Infrastructure: The Umberto Tunnel in Rome, one of the first large-scale applications of smog-eating paint.
- Eco-Murals: Large artistic projects across cities in Europe and the US, transforming walls into functional urban lungs.
- Corporate Spaces: Installations at Autogrill headquarters and IKEA retail spaces, improving indoor air quality for employees and visitors.
- Smart Buildings: Integration into projects such as London's Bird Street and Dubai's Office of the Future, demonstrating Airlite®'s value in forward-looking sustainable architecture.

These applications demonstrate the versatility of Airlite® in both functional and symbolic dimensions: combining design, health, and sustainability in a single product.

Financials & Recognition

Airlite® has grown steadily, attracting institutional support and recognition:

- Beneficiary of EU Horizon 2020 SME Instrument funding.
- Raised over €800K in seed capital.
- Strategic partnership with Intesa Sanpaolo, which has invested in the company and holds approximately 18% of its shares.
- Recognized by the United Nations as one of the four most effective technologies against air pollution.

Vision & Impact

Airlite® vision extends beyond product innovation, aiming to redefine the relationship between architecture and the environment. By turning walls into active environmental allies, the company contributes to healthier homes, cleaner cities, and more resilient societies. Its ambition is to scale globally, offering a simple yet revolutionary solution to some of the most pressing challenges of our time—air pollution, climate change, and public health.

LEARN MORE ABOUT THE BLUE PLANET S.P.A.

Vegea S.r.l.

FROM WINE TO DESIGN: PIONEERING SUSTAINABLE BIOMATERIALS

VEGEA

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Milan, Italy | Production & R&D facilities in Northern Italy

Introduction & Mission

Established in Milan in 2016, Vegea S.r.l. embodies the intersection of design vision and scientific innovation. The company was established to address a critical gap in the global materials market: the need for sustainable, cruelty-free, and high-performance alternatives to both animal leather and fossil-based synthetic leathers.
The name VEGEA derives from the combination of VEG (vegan) and GEA (Mother Earth), symbolising its core mission: to create innovative biomaterials that are respectful of animals, people, and the planet. Vegea's approach exemplifies circular economy principles, transforming agricultural waste into durable, beautiful, and functional materials, aligning with the growing demand for eco-conscious design.

Vision & Circular Innovation

Vegea leverages agro-industry biomass, specifically grape pomace (skins, seeds, and stalks), to craft high-performance, bio-based biomaterials with the aesthetic, tactile, and mechanical qualities of traditional leather—without the use of harmful tanning agents or water-intensive processes. In doing so, Vegea transforms a ubiquitous byproduct—estimated at 7 billion kg globally per year—into a resource capable of yielding up to 3 billion square meters of material annually.

Technology & Production

The proprietary Vegeatextile® process involves drying and treating grape pomace, extracting bio-oils and natural polymers that are combined with vegetable fibres and coated onto textile substrates. Unlike traditional tanning, the process is solvent-free, heavy metal–free, and water-efficient, avoiding the toxic chemicals commonly associated with animal leather or PVC-based synthetics.
The result is VegeaTextile®, a family of materials with the tactile, mechanical, and aesthetic properties of leather. It is resistant, flexible, and highly customizable in thickness, texture, and finish, making it suitable for a wide range of applications—from fashion to automotive interiors.

Certifications & Sustainability Credentials

Sustainability is embedded in Vegea DNA. By repurposing agricultural waste, the company not only prevents disposal but also reduces reliance on fossil-based raw materials. Its production processes boast an extremely low water footprint compared to animal leather tanning.
Vegea holds several internationally recognized certifications:

- GRS (Global Recycled Standard) certification for its textile backings.
- Full compliance with REACH regulations, ensuring safety and traceability.
- Recognition by the H&M Foundation Global Change Award (2017) as one of the world's most disruptive innovations in sustainable fashion.

With local sourcing and manufacturing in Northern Italy, Vegea minimises transportation impacts and supports regional circular economies, strengthening the link between agriculture, chemistry, and design.

Applications & Brand Collaborations

The versatility of Vegea's materials has attracted major global brands:

- Automotive: Collaborations with Bentley on concept cars integrating Vegea interiors.
- Fashion & Accessories: Projects with H&M, Calvin Klein, Tommy Hilfiger, Diadora, Serapian, Le Coq Sportif, and

& Other Stories.
- Footwear: Collections with Geox and limited-edition sneakers.
- Stationery & Lifestyle: Partnerships with Moleskine for eco-conscious notebooks.
- Design & Interiors: Inclusion in high-profile exhibitions such as the Copenhagen Fashion Summit and installations at the FAO World Food Forum.

These collaborations demonstrate not only Vegea's technological credibility but also its ability to scale production while maintaining a luxury aesthetic and ethical values.

R&D & Industrial Integration

Vegea S.r.l. invests heavily in R&D, operating in-house laboratories and pilot production lines to refine its materials and tailor them to different sectors. Its team of chemists, engineers, and designers collaborates closely with wineries, universities, and industrial partners to expand applications—from high-end fashion to furniture, packaging, and mobility.
This cross-sector integration ensures that Vegea's materials meet stringent performance standards in terms of durability, flexibility, and resistance, while also catering to the creative industries that demand aesthetic variety and innovation.

Sustainability Impact

By eliminating water-intensive tanning processes and toxic chemicals, Vegea achieves a nearly zero water footprint compared to traditional leathers, where one square meter of animal leather can consume up to 17,000 litres of water. Vegea's process requires only minimal amounts, ensuring a water saving of over 95%.
The use of grape pomace prevents thousands of tons of agro-waste from being discarded each year. With global wine production generating over 7 billion kilograms of grape byproducts annually, the scalability of Vegea's process could yield 3 billion square meters of bio-based material, reducing reliance on fossil-derived synthetics.
Localised sourcing and production in Northern Italy minimise transport-related emissions and strengthen regional circular economies, while life-cycle analyses show a potential 40–50% reduction in CO_2 emissions compared to conventional leather.
Beyond environmental metrics, the model fosters synergies between agriculture and industry, adds value for wineries, creates green jobs, and positions Italy as a leader in circular design and sustainable manufacturing. Vegea demonstrates that biomaterials can combine durability, aesthetics, and sustainability, while supporting climate targets and driving social innovation.

LEARN MORE ABOUT VEGEA S.R.L.

SUMMARY
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