English Version

ETV4 SMEs

COMPENDIUM OF ENVIRONMENTAL TRANSITION SUCCESS STORIES FROM SMES

Co-funded by the European Union

“One person can make a difference, and everyone should try”.

John F. Kennedy

Table of contents

1 **Introduction**

1.1 Project overview and objectives

1.2 Target audience

2 **Methodology**

2.1 SME selection process and criterias

2.1 Interview approach

3 **Summary of Business Cases**

3.1 Overview of participating SMEs (sectors and countries)

3.2 Key thematic insights

4 **Business Cases**

4.1 Asket - polish company with ETV technology

4.2 Soupculture

4.3 Organic Polska

4.4 IRIDRA Srl

4.4 Inray Oy Ltd

4.5 Carborem

4.6 Cimberio

4.7 Deref

4.8 HBI

4.9 Pozzoli

5 **Cross-Case Analysis from the case studies**

6 **Implications for VET providers and SME leaders**

7 **Suggestions for future support and training**

8 **Quick scan of ETV companies**

Participating Project Partner Organisation

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA).
Neither the European Union nor EACEA can be held responsible for them.

Authors:
Barbara Goleniewska
Simone Pagni

1. Introduction

Introduction

This compendium is created in the context of a broader shift in the European economy towards the goals of the European Green Deal and the principles of the circular economy. While larger companies are often bound by extensive reporting obligations and have greater resources to support sustainable transformation, small and medium-sized enterprises (SMEs) face the challenge of initiating change in a less formal but equally impactful way.

The question many SME owners and managers ask themselves is: How can we begin the journey towards environmental transition? The transformation process often raises additional questions: What prompted the change? What resources and competencies were necessary? How can these skills be developed? And perhaps most importantly – what are the tangible benefits for the company, its customers, and the environment?

This compendium seeks to provide answers by presenting 10 real-life business cases of SMEs that have successfully implemented environmental transition processes, verified under the EU's Environmental Technology Verification (ETV) scheme or supported by similar sustainability frameworks. Through structured interviews, each SME shares its unique story: how the transformation began, the challenges faced, the strategies applied, the stakeholders involved, and the lessons learned. These are not idealised success stories, but authentic accounts that also acknowledge the obstacles and setbacks encountered along the way.

The objective of this collection is twofold:

- To inspire SME leaders by showing concrete examples of change that is both achievable and beneficial.
- To equip vocational education and training (VET) providers with practical, real-world examples and teaching materials they can integrate into their training offers for SME owners, managers, and employees.

The stories collected here are intended not only as case studies, but as practical roadmaps—evidence that environmental transition is not an abstract policy goal, but a strategic opportunity for innovation, efficiency, and long-term business resilience.

1.1. Project overview and objectives

ETV4GreenSMEs – Accelerating SMEs' Green Transition is a European initiative dedicated to helping small and medium-sized enterprises (SMEs) adopt sustainable and environmentally responsible practices. By using the EU Environmental Technology Verification (ETV) scheme and other environmentally friendly solutions implemented by SMEs, the project aims to inspire other businesses to carry out transformation within their own organisations. Showcasing the transformation path, the challenges faced, the obstacles overcome, and—most importantly—the benefits achieved will make it easier for other companies to decide to embrace change.

With the support of the Erasmus+ programme and over 15 years of combined partner experience, ETV4GreenSMEs brings together expertise, tools, and real-life examples to guide SMEs in their environmental transition.

Our activities include:

- Developing and sharing 10 authentic SME success stories to inspire others.
- Providing tailored training resources for vocational education and training (VET) providers.
- Hosting eco-innovation workshops and networking events.
- Promoting awareness and practical use of the EU ETV scheme.

The project works closely with SME owners, managers, and VET educators—two key groups that can lead and accelerate change in European businesses.

Objectives

- Encourage SME leaders to develop Green Action Plans
- Inspire change through case studies, workshops, and peer learning.
- Promote access to the EU ETV scheme and success stories
- Show how verified technologies can increase trust, competitiveness, and environmental performance.
- Equip VET providers with tailored training tools
- Ensure educators have ready-to-use materials to support SMEs on their sustainability journey.
- Facilitate knowledge sharing and collaboration
- Organise events that connect SMEs, experts, and stakeholders to exchange best practices and solutions.
- Build long-term capacity for eco-innovation
- Strengthen the competencies of SME managers and their teams to integrate sustainability into daily operations.

1.2. Target Audience

ETV4GreenSMEs is designed to support a diverse audience centered around the green transition of small and medium-sized enterprises (SMEs) throughout Europe. The primary target audience includes SME owners, managers, and decision-makers who are committed to integrating sustainable and environmentally responsible practices within their business operations. These individuals play a crucial role in shaping their companies' environmental impact and are eager to adopt innovative green technologies and solutions.

In addition, the project actively involves vocational education and training (VET) providers, who serve as key facilitators in delivering practical knowledge, tailored resources, and training to SMEs. By empowering VET institutions, ETV4GreenSMEs ensures that SMEs receive accessible and relevant guidance that fits their specific sustainability challenges and opportunities.

Moreover, the project engages environmental experts, technology specialists, policy makers, and stakeholders from the broader green innovation ecosystem.

Through workshops, networking events, and knowledge-sharing platforms, these groups contribute expertise, facilitate collaboration, and help create a supportive environment for eco-innovation.

Ultimately, ETV4GreenSMEs aims to foster a collaborative community where SMEs, educators, and experts work together to accelerate the green transition, making sustainability a practical and achievable goal for businesses of varying sizes and sectors.

2. Methodology

2.1. SME selection process and criteria

The selection of SMEs for this project began with an in-depth desk research phase aimed at understanding the current landscape of Environmental Technology Verification (ETV) implementation in Poland and Italy. This research involved analyzing official reports, strategic documents, databases, and case studies to identify existing barriers to ETV adoption, such as regulatory challenges, lack of awareness, or financial constraints. The research also mapped key stakeholders involved in ETV processes and explored reasons behind the suspension or limited uptake of ETV schemes.

Building on this knowledge, the project partners collaboratively developed a set of clear and practical criteria to select SMEs that would be suitable for detailed case study analysis. The criteria were designed to ensure relevance, diversity, and willingness to participate, and included:

Business sector diversity: SMEs operating in manufacturing, service, and retail sectors to cover a wide range of environmental impact profiles and transition pathways.

Experience with environmental initiatives: Preference was given to companies that had already engaged with ETV or similar environmental certifications or transition processes.

Geographical diversity: While the focus was on Poland and Italy, SMEs from other EU countries (Finland) were considered to enrich the case studies with different contexts and experiences.

Collaboration readiness: SMEs willing to openly share insights about their internal processes, challenges, and successes to provide meaningful contributions to the project.

This structured and inclusive selection process resulted in a balanced shortlist of approximately 10 SMEs, enabling a comprehensive overview of the practical realities of green transitions in diverse small and medium enterprises.

2.2. Interview Approach

Following the selection, the project team initiated a series of structured interviews with representatives from the shortlisted SMEs. The interview process was designed to be semi-structured to allow flexibility for in-depth exploration of each company's unique experiences while maintaining consistency across interviews for comparability.
The interview procedure included several key steps:

Initial contact and invitation: SMEs were formally invited to participate and provided with an overview of the interview's purpose and structure.

Scheduling: Interviews were arranged at mutually convenient times to ensure full engagement.
During the interviews, participants were guided through a set of carefully crafted questions addressing critical aspects of their environmental transition journey.

These included:

Motivation and initiation: What triggered the decision to start the environmental transition? Was it driven by internal strategy, regulatory pressures, market demands, or other factors?

Resources and skills: What types of human, financial, and technical resources were required? Were new competencies developed internally or acquired externally through training or consultancy?

Challenges and barriers: What obstacles did the SMEs face during the process? How were these addressed or overcome?

Stakeholder engagement: How did suppliers, customers, and partners react? What role did communication and collaboration play?

Outcomes and benefits: Were there measurable improvements in costs, efficiency, reputation, or market opportunities?

Lessons learned and future plans: Reflections on what could be done differently and plans for further environmental improvements.

A standardized interview template with up to **10 main questions** and additional probing questions ensured that the data collected was rich, detailed, and comparable across cases.

This approach allowed the project to gather valuable insights that will form the basis of ten in-depth case studies, showcasing successful green transition stories and offering practical guidance to other SMEs and vocational education and training providers.

3. Summary of Business Cases

3.1 Overview of participating SMEs (sectors and countries)

The case studies focus on three main Environmental Technology Verification (ETV) sectors: **Water Treatment and Monitoring, Materials, Waste and Resources, and Energy Technologies**, with SMEs from **Italy, Poland (2), and Finland**. This selection allows analysis of both sectoral and national differences in the environmental transition of SMEs.

Sectoral Distribution:

Water Treatment and Monitoring includes SMEs developing filtration systems, sensors, and water recycling technologies. Italian and Finnish companies dominate this sector, reflecting strong national support for water management and innovation.

Materials, Waste and Resources covers SMEs working on sustainable materials, recycling, and circular economy solutions. Polish SMEs are particularly active, often collaborating with leaders, universities and industry networks, while Italian SMEs focus on eco-design and sustainable sourcing.

Energy Technologies includes SMEs involved in renewable energy, energy efficiency, and storage solutions. Finnish SMEs lead in technological innovation, while Italian and Polish SMEs focus on decentralized renewable energy and building efficiency.

Geographic Distribution:

Italy: SMEs combine regulatory compliance with market-driven sustainability initiatives, using certifications to enhance reputation.
Poland: SMEs face financial and technical constraints, relying on external support and phased implementation strategies.
Finland: SMEs benefit from supportive policies and strong environmental awareness, integrating sustainability into core business models from the outset.

Cross-sector Observations
Across sectors and countries, SMEs share common features: strong leadership commitment, adaptability, and reliance on both internal processes and external partnerships. Financial and technical constraints are common, but SMEs overcome them through phased implementation, collaboration, and stakeholder engagement.

In summary, the participating SMEs represent innovative actors across three ETV sectors and three European countries. Their experiences provide insights into the drivers, challenges, and strategies for successful environmental transition in SMEs.

3.2 Key thematic insights

Environmental transition in companies, especially in SMEs, is a complex and multifaceted process. When reading interviews with businesses that have undergone this process, it is important to view them not just as descriptions of specific actions, but as a source of knowledge about practical challenges, strategies, and experiences. Interviews help to understand what factors motivate companies to change, what resources are needed, which skills must be developed, and what obstacles and successes arise during the implementation of environmental initiatives.

When analyzing company statements, it is particularly important to consider how the transition process began. Attention should be paid to what triggered the decision—whether it resulted from internal motivation, regulatory pressure, customer expectations, or other external factors. It is also relevant to identify who in the organization acted as the initiator and how employees, suppliers, and customers were engaged. Such insights help to understand the dynamics of implementing changes and the role of communication in the transition process.

Another area worth attention is the environmental standards and certifications implemented. When analyzing responses, it is useful to check how long it took to achieve them, which departments were responsible, and to what extent external support was needed. This information helps assess the real workload, costs, and knowledge required to achieve specific environmental goals.

Special attention should be given to the resources and competencies necessary within the company. Interviews often reveal which new skills were key—for example, in data analysis and performance measurement, sustainability strategy, green supply chain management, innovation and eco-design, as well as stakeholder communication. It is important to observe how long it took to develop these competencies and what training or support was required for the team to effectively achieve environmental objectives.

3.2 Key thematic insights

Equally important is understanding the challenges and obstacles encountered during the transition. When analyzing interviews, attention should be paid to financial, technical, and organizational barriers, as well as the strategies used to overcome them. Information on the role of leadership and external expert support allows drawing practical conclusions that can be useful for other companies planning similar changes.

Finally, it is valuable to look for evidence of the outcomes of implementation—both financial and reputational—as well as lessons learned from the experience. Observing which actions brought the greatest benefits, which initiatives were most effective, and what organizational changes were key provides practical insights for the reader to adapt best practices to their own context.

In summary, reading interviews with companies that have implemented environmental transition requires focusing not only on the described actions but also on the mechanisms and experiences behind their successes or difficulties. Understanding the initiating factors, utilized resources, developed competencies, encountered challenges, and achieved results provides practical insight into the transition process and helps better prepare one's organization for implementing sustainable changes.

4. Business Cases

Interview with Asket company manager Barbara Pokrzywa

Company Size: small
Sector: agricultural machinery sector
Country: Poland
Website: https://asket.pl/

Bioenergy

ASKET, a Polish company, developed the BIOMASSER® technology, which enables the briquetting of moist biomass (up to 30% moisture) without the need for drying. This environmentally friendly solution transforms agricultural residues like straw or reed into solid biofuel briquettes, reducing emissions and supporting circular economy principles. BIOMASSER® was the first European technology to receive official verification under the EU Environmental Technology Verification (ETV) program.

How did your company begin the process of ecological transformation?

The company began operations in 1984, and since 2005 it has operated under the Asket brand. Since 1984, the idea behind our activities has been to provide local communities with energy in the right quantity, quality, and time, while respecting the environment.
Since 2003, we have focused on developing innovative technologies for processing agrobiomass, which led to the creation of the Biomasser briquetting machine in 2005. Our main goal is to create efficient and environmentally friendly solutions such as the Biomasser briquetting machines and Tomasser shredders. These devices make it possible to process locally available, often unused raw materials—such as surplus straw, hay, or reed—in a simple and energy-efficient way.
The resulting briquettes are 100% natural, ecological, and can serve as a sustainable supplement or alternative to fossil fuels or wood-based biomass fuels (such as pellets or briquettes).
The initiative to pursue the ETV statement came from the company's owner, Roman Długi, after attending one of the training sessions for laureates of the GreenEvo project organized by the Ministry of Climate and Environment. During this training, we learned about the ETV pilot program. Since ETV focused on innovative and environmentally oriented technologies, it was a perfect fit for our product portfolio.

What environmental certifications or processes have you implemented in your company?

Obtaining the ETV Statement took approximately 9 months. In addition to the ETV and the positive verification of the BIOMASSER® BSX14 machine, we are actively involved in educational initiatives such as Brykietolandia, the European Sustainable Development Week, and we are a laureate of GreenEvo – a program by the Ministry of Climate and Environment supporting the promotion of Polish green technologies worldwide.
The Biomasser was showcased at the COP14 conference in 2008 in Poznań (where the machine produced straw briquettes live at the booth!) and at COP23 in 2017 in Bonn.

What resources (human, financial, technical) were necessary to carry out the transformation?

Technical: Development and production of briquetting machines (since 2005) and shredders (since 2007). The design and manufacturing of the machines have been carried out using our in-house engineering team and internal production resources.
Organizational: Own agro-energy farm located in Gniewkowo, Greater Poland Voivodeship, where we cultivate cereals.
Financial: Own investments as well as support from the GreenEvo program for international business missions.

What new skills or competencies were necessary within your team?

Not technical, but informational and marketing-related skills were necessary.
We had to learn how to communicate environmental values—especially those related to ETV—as they were often misunderstood. Many people associated ETV with television due to the presence of the letters “TV” in the acronym.

In addition, clients expected financial support for investments in verified pro-environmental technologies, which, unfortunately, has never been implemented (for over 10 years now).

What were the main challenges or obstacles during the transformation?

The transformation has been—and still is—primarily about the economic, political, and social perception of technical solutions, in which environmental benefits are not considered of significant importance. In a world where Milton Friedman's metaphor still holds strong—“The business of business is business”—environmental concerns unfortunately do not take priority.
Our clients expect financial returns from implementing technologies. If additional funding can be obtained to support such investments, it becomes a key factor, because sustainable development must be economically viable for businesses. The growth of consumer photovoltaics is a prime example of this—although it is now taking an unfavorable turn due to the oversupply of electricity, particularly during sunny months. That is why we must focus on diversifying energy sources.
The approach to broadly understood sustainable development and corporate responsibility is changing, as it has now become part of legal regulations. The CSRD directive has introduced mandatory ESG reporting, although it currently applies mainly to large companies and public interest entities. This brings a sense of hope—although in the current “stop the clock” environment and ongoing geopolitical uncertainty, its implementation may take a different direction or be significantly delayed.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?"

Our initiatives have received very positive feedback from a wide range of stakeholders. However, due to the lack of a coherent agrobiomass utilization program in the EU and in Poland, our solutions mostly operate on an individual level—limited to those who are aware of the concept and willing to invest in it. Briquettes are very well received in our community and by our regular clients. Utilizing locally available raw materials, such as straw, helps secure energy for rural areas and supports the fight against energy poverty. Briquettes are easier to store and more resistant to moisture than large straw bales, and their production is simple (cutting straw into 1–5 cm pieces, briquetting = 100% natural briquette).

When the war between Ukraine and Russia broke out, our briquette sales increased by 300%, and there was a long waiting list for the rental of Biomasser mobile briquetting machines. This demonstrates that people are aware of our solution—but mostly turn to it in times of crisis.
We communicate our environmental initiatives through social media (Facebook, LinkedIn, Instagram, YouTube, TikTok) and at trade fairs in Poland and abroad. However, these actions have not yet brought measurable effects, largely due to the absence of a coordinated policy for agrobiomass, which we have been advocating for years—not only as a company, but as part of a broader industry community.
We have been participating in the European Sustainable Development Week (ESDW – 17 SDGs) since 2015 and promote environmental action (not only agrobiomass-related) through our Brykietolandia ecological workshops.

Biomasser briquetting machines have been applied in several international projects, including:
The European Go-Grass project (Horizon 2020) – in Sweden, for hygienizing canary reed grass used as animal bedding https://www.go-grass.eu/project/sweden-animal-bedding/
The European Go-Grass project (Horizon 2020) – in Germany, for briquetting grass biomass from the Lower Oder Valley, later used to produce biochar https://www.go-grass.eu/project/germany-biochar/
"Using biomass in the context of natural habitat protection" – carried out by the Club of Naturalists, with support from the EU LIFE program, the National Fund for Environmental Protection and Water Management (NFOŚiGW), and the Regional Fund in Zielona Góra
"Keep Mwanga Green" in Tanzania – aimed at reducing deforestation for firewood by replacing wood with briquettes made from local grasses using Biomasser technology
https://www.money.pl/archiwum/wiadomosci_agencyjne/pap/artykul/jaczewska;polskie;zielone;technologie;zdobywaja;azje;i;europe,16,0,1248272.html

What were the key success factors in achieving your environmental goals?

Pioneering approach – we developed the first straw briquetting machines in Poland (since 2005) and, according to our market research, the only ones in the world capable of processing raw material with up to 30% moisture content (although unfortunately we do encounter cases of our solutions being copied).
Strong involvement of the founders and their engineering backgrounds (Dorota and Roman Długi, Barbara Pokrzywa), along with consistency and credibility of our actions, access to our own technical equipment and facilities, a committed team, technical knowledge, energy sector experience, expertise in energy efficiency, language skills, and a deep understanding of agricultural machinery and crop production—all of these, combined with our independence from external funding or consulting support, were key to achieving our environmental goals. This includes obtaining the ETV Statement (without any external financial aid) and exporting our machines to over 30 countries worldwide.
Green marketing and public education (international and domestic trade fairs, participation in GreenEvo missions) also played a crucial role. One of the most convincing elements has been our live demonstrations of the machines in action—something we always present whenever possible.
Laboratory testing of straw briquettes by the renowned SGS lab confirmed the heating value and chemical composition, supporting the credibility of our claims.

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

The ETV Statement is highly important for us, especially as it confirms the efficiency of our briquetting machine when processing raw material with moisture content of up to 30%. To this day, this remains a unique parameter on the market, as the prevailing belief is still that raw material must first be dried to 10%–15% moisture content before compaction (as is typical for pelletizing or piston briquetting).
Additionally, the ETV verifies energy consumption in kWh per ton of briquettes produced—rather than per hour of machine operation, which is often the case. This makes the data much more meaningful and quantifiable.

Looking back, would you change anything in your approach to the transformation?

Today, we would probably engage in educational activities earlier, but our analytical and iterative approach has worked well – we do not see the need for any major changes.

What are your future plans regarding further environmental initiatives?

Our goal is to support the development of local and regional agrobiomass centers (RCA, LCA), which enable the efficient use of available, often underutilized raw materials in accordance with the principles of sustainable development and the circular economy.
One such local center, "Asket LCA," operates on our farm in Gniewkowo, where we also run the educational program "Brykietolandia." At Asket LCA, only local fuel raw materials can be purchased, such as straw briquettes, wood chips, and firewood obtained from maintenance operations around our agricultural areas. Additionally, briquetting machines can be rented. Participation in the "Brykietolandia" workshops allows attendees to learn about the entire agrobiomass management cycle – from grain cultivation in the fields, straw harvesting, storage, processing into briquettes, to burning in automatic boilers and using the ash as fertilizer within the circular economy framework. Brykietolandia also promotes sustainable development beyond energy aspects – more information is available at https://asket.pl/brykietolandia.
In our activities, we also implement carbon farming practices aligned with climate goals, CO2 sequestration, and support for rebuilding organic matter in the soil.
We continuously improve the Biomasser briquetting technology, mainly regarding wear parts. Currently, we have the 9th generation of briquetting machines, including the automatic Biomasser Duo Automatic briquetting machine. The improved briquetting models are based on the verified BSX14 model. The Biomasser briquetting machine also follows the ecodesign principles, characterized by durability (we still operate a machine produced in 2007 at full capacity), reparability, low noise levels, and 95% recyclability.

Company Size: micro
Sector: HoRECa
Country: Poland and another countries: UA, UK, SE,FI, DE
Website: https://www.soupculture.pl/en/

Waste managament

This innovative technology involves proprietary, on-site baking of heat-resistant, edible bread cups —crafted from fresh, natural dough and uniquely designed ovens—to serve hot cream soups in a fully biodegradable, handheld format that eliminates disposable packaging and maintains structural integrity for at least 20 minutes.

Interview with Soupculture company manager Kyrylo Puzenko

How did your company begin the process of ecological transformation?

Soupculture was founded with sustainability at its core. The concept of serving vegetarian cream soups in edible cups was not a later adaptation but an original response to environmental and social challenges.
The decision to develop this ecological approach was my personal initiative. Growing up in Mariupol, Ukraine, I witnessed the devastating environmental impact of heavy industry. This experience motivated me to create a waste-free, people-friendly alternative to conventional street food.
The transformation was internally driven. I aimed to offer a mobile, healthy, and zero-waste food solution. Later, public demand for sustainable options further confirmed the importance of this direction.

What environmental certifications or processes have you implemented in your company?

While Soupculture has not yet obtained formal environmental certifications, we have implemented internal eco-processes from the beginning. These include the use of edible packaging, locally sourced ingredients, vegetarian-only recipes, and energy-efficient production methods.
These practices were embedded into operations during the company's early development phase, taking approximately 6–12 months to stabilize across all locations. The core team was responsible for implementation, guided by a sustainability-first approach.
No external consultants were hired — the processes were developed in-house, based on practical knowledge, continuous testing, and a clear commitment to zero waste and low-carbon goals.

What resources (human, financial, technical) were necessary to carry out the transformation?

The ecological transformation of Soupculture was carried out using internal resources. A compact, committed team managed the development of edible packaging, vegetarian recipes, and efficient production workflows. While no full-time staff or external consultants were hired, we collaborated with several chefs to develop unique and locally adaptable soups.
Technical adaptation was handled in-house. The initiative was financed through personal investment and reinvestment of business revenue, without relying on external grants.
We remain open to future partnerships or funding that support our sustainable goals and international growth.

What new skills or competencies were necessary within your team?

To implement our ecological concept, the team needed to develop skills in dough formulation, edible packaging durability, energy-efficient food production, and vegetarian menu design. Additionally, competencies in customer interaction without traditional table service, mobile food logistics, and low-waste operations were essential.
The upskilling process was mostly hands-on and iterative, taking approximately 6–9 months. Training was conducted internally through practical testing, process refinement, and regular feedback loops.

What were the main challenges or obstacles during the transformation?

The main challenges were a combination of technical and organizational issues. Technically, it was difficult to achieve the right balance in dough composition and baking to ensure the cup was both edible and leak-proof. Organisationally, adapting a kitchen workflow to a mobile, low-waste format required extensive testing and rethinking of traditional food service models.
These challenges were overcome through continuous experimentation, close teamwork, and iterative improvement. Financial constraints were present but managed by keeping the structure lean and focusing on practical, scalable solutions.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?"

Stakeholders have been highly supportive of our environmental initiatives. Clients appreciate the sustainable, waste-free dining experience, which aligns with growing global demand for eco-friendly products. Soupculture's international experience has shown that this edible soup concept works well beyond Ukraine. We actively engage stakeholders through transparent communication and marketing campaigns that highlight the environmental benefits of our edible cups.

What were the key success factors in achieving your environmental goals?

Strong management commitment was essential to embed sustainability into every aspect of Soupculture's operations. Additionally, partnerships with local suppliers and environmental organizations helped us optimize sourcing and raise awareness. Transparent communication and continuous innovation also played a crucial role in meeting our environmental objectives

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

Yes, Soupculture has achieved measurable benefits including significant reductions in packaging costs by eliminating disposable containers. The innovative edible cup has improved our brand reputation, attracting eco-conscious customers and opening new markets internationally. Unexpectedly, the unique product sparked media interest and collaborations with environmental organizations, further boosting visibility and sales.

Looking back, would you change anything in your approach to the transformation?

If starting over, we would invest earlier in stakeholder engagement and education to accelerate market acceptance. A key lesson learned is the importance of clear communication about the product's benefits and usability to overcome initial skepticism. We also gained insight that flexibility in product variants, like gluten-sugar-free options, broadens our customer base and market reach.

What are your future plans regarding further environmental initiatives?

Soupculture plans to expand its range of edible products and develop new biodegradable packaging solutions. We will continue investing in energy-efficient production and stakeholder education to strengthen sustainability. A key focus is accelerating international market expansion to bring our eco-friendly concept to a global audience increasingly demanding sustainable food options.

Interview with Michał Wójcik- Manager of Organic Polska

Company Size: Micro <50 employees
Sector: Ecological packaging
Country: Poland
Website: https://organicpolska.com/

Waste managament

Technology produces heavy-duty, eco-friendly cardboard packaging such as containers, pallets, and stabilizers that replace wood, plastic, and metal. It uses thick, glued cardboard panels combined with woodworking and cardboard production machinery to ensure strength and precision. The solutions include custom packaging and large containers designed for safe transport of liquids, prioritizing durability and environmental sustainability.

How did your company begin the process of ecological transformation?

The decision to pursue a green transformation was a natural outcome of the company's philosophy – from the very beginning, Organic Polska has focused on sustainable development and the use of eco-friendly materials such as corrugated cardboard. The impetus was both an internal need to act in line with the company's values and client expectations, as well as market changes. The decision to start the green transformation was also a conscious response to increasing legal requirements and market demands for sustainable and eco-friendly solutions. This process was supported by internal employee education and inspiration from collaboration with business partners, enabling the creation of a strong pro-environmental culture within the company.

What environmental certifications or processes have you implemented in your company?

The company holds an ISO 9001 certificate covering the production and design of cardboard packaging. This standard supports the implementation of high-quality processes and the First Time Right (FTR) philosophy, minimizing waste and ensuring production efficiency. Processes were introduced for designing and producing packaging in line with waste reduction principles and the use of recycled materials (e.g., waste paper). The company operates according to FSC standards. Implementing new eco-friendly solutions is a continuous process coordinated by the technology and production department.

What resources (human, financial, technical) were necessary to carry out the transformation?

The company invested in both staff development and modern machinery (plotters, gluing machines, laminating machines). European funds were utilized (e.g., in 2021), enabling significant production capacity increases without using non-ecological materials. Production waste is fully managed or sent for recycling directly to the paper producer, supporting the circular economy principle. Single-material products facilitate sorting and further recycling.
Regarding human resources, the company relied on both upskilling the existing team and collaborating with external experts when necessary. Internal staff underwent dedicated training to operate new eco-technologies and implement sustainable production processes. Additionally, external consultants supported the planning and execution of more complex environmental actions, such as waste minimization strategies and circular economy integration. This combination of internal development and external knowledge was key to a successful and efficient green transformation.

What new skills or competencies were necessary within your team?

The team underwent a series of training sessions on designing eco-friendly packaging and working with modern software and machinery. Competencies were developed in logistics optimization and adapting products to circular economy principles. The process lasted several months. The team was also trained in zero-waste principles and the First Time Right philosophy, increasing environmental awareness and promoting a culture of waste minimization at all stages of production.

What were the main challenges or obstacles during the transformation?

The challenges were mainly technical (e.g., adapting machines to new technologies) and organizational (coordinating multiple departments). Investments in machinery and skills development helped overcome these barriers. Implementing the zero-waste philosophy and First Time Right principles required changing habits and the approach of the entire team, which was an organizational challenge. Consistent support from management and intensive internal communication were necessary to maintain employee engagement and effectively achieve the company's environmental goals.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?"

Reactions were definitely positive – customers appreciate the eco-friendly approach and the elimination of non-ecological materials from their own processes. The company actively communicates its values and supports the reuse of cardboard packaging. Organic Polska promotes the circular economy culture both internally and externally, e.g., through organizations like the Lublin Industrial Plateau, strengthening regional partnerships and contributing to green transition development. The company also shares its implemented eco-principles with business networks, such as the Lublin Business Club (with over 160 business entities and supporting organizations).

What were the key success factors in achieving your environmental goals?

The key factor was the engagement of owners and management. Being a family business facilitated internal change implementation. Partnerships with cardboard and technology suppliers and EU support also played an important role. Organic Polska consistently follows circular economy principles, using recycled materials that can be recycled again after use. This approach minimizes waste and supports sustainable development, forming the foundation of the company's ecological operations. Continuous education and experience exchange within local and industry initiatives, such as the Lublin Industrial Plateau, were also important success factors. Participation in such networks fosters environmental awareness and motivates the adoption of innovative solutions.

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

Yes – the company saw an increase in sales and acquired new clients due to its eco-friendly profile. Reducing packaging weight and simplifying logistics brought real financial savings. The company's reputation also improved.

Looking back, would you change anything in your approach to the transformation?

The transformation was well thought out and staged. Earlier investment in automation could have been considered, but gradual implementation proved safe and effective. The main lesson: it is worth combining ecology with innovation and long-term planning. Understanding the importance of long-term planning and stepwise change implementation allowed stable and safe development of eco-friendly production processes. In the future, the company plans further automation to increase efficiency and further reduce waste.

What are your future plans regarding further environmental initiatives?

The company plans to further develop the production of multi-layer IBC containers and cardboard pallets and implement new recycling technologies. The main goal is ecological: eliminating non-eco materials and further reducing the carbon footprint. Long-term plans include introducing carbon footprint monitoring systems and expanding educational activities for employees and business partners. The company also intends to continue developing circular economy-compliant products, strengthening its position as a local leader in eco-friendly packaging solutions.

Company Size: Micro <50 employees
Sector: Water Treatment and Monitoring
Country: Italy
Website: https://www.iridra.com/

Water Treatment and Monitoring

The name of technology: HYDRO-1

Description of the Technology Context: HYDRO-1 technology combines anaerobic treatment and nature-based solutions with constructed wetlands to reclaim water and nutrients, producing treated effluent that meets EU "Class A" standards for safe reuse in agricultural irrigation, even under varying Mediterranean climate conditions.

How did your company begin the process of ecological transformation?

The company, which is already involved in environmental management, decided to start the ETV (Environmental Technology Verification) process to give greater visibility and credibility to its product.

What environmental certifications or processes have you implemented in your company?

The ETV certification process lasted about a year and was managed by the company's technical experts, without the help of external consultants.

What resources (human, financial, technical) were necessary to carry out the transformation?

Some external grants were used, since HYDRO-1 is a technology developed within the Horizon2020 EU funded project of HYDROUSA (Demonstration of Water Loops with innovative Regenerative Business models for Mediterranean Region, www.hydrousa.org), a project submitted under the call CIRC-02-2016-2017 Water in the context of the circular economy (Grant Agreement No. 776643).

What new skills or competencies were necessary within your team?

No additional skills were necessary.

What were the main challenges or obstacles during the transformation?

The biggest challenge was finding reliable and field-applicable test methods. This technical and organizational problem was overcome thanks to the constant support of the ETV inspector, who helped define the appropriate procedures to successfully perform the tests.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?"

The ETV certification had a positive impact on customers and suppliers, who appreciated the increased reliability and visibility of the system. The company noticed that after the certification, it was easier to convince customers of the product's quality, which led to an increase in sales.

What were the key success factors in achieving your environmental goals?

According to the company, the success of the operation was due to internal commitment, the collaboration of suppliers, and the strong support from the staff at Rina Services Spa, the entity that conducted the verification.

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

Following the achievement of the ETV certification, we noticed a greater ease in convincing our customers about the quality and reliability of the product. Sales increased.

Looking back, would you change anything in your approach to the transformation?

No.

What are your future plans regarding further environmental initiatives?

Looking to the future, the company, which primarily deals with installation and maintenance of wastewater treatment plants, will continue to focus on product quality, environmental respect, and qualified technical assistance. It does not rule out the possibility of submitting other new products for ETV verification in the future. The company also advises other businesses considering a similar path to invest in their own technical department to manage the procedure independently.

Inray Oy Ltd

Company Size: Medium
Sector: Industrial process technology
Country: Finland
Website: www.inray.fi

Energy Technologies

The name of technology: FUELCONTROL®

Description of the Technology Context :
Fuelcontrol-the real-time X-ray scanning technology continuously measures the quality of solid fuels by detecting moisture levels, foreign objects, and energy content as the fuel moves on a conveyor, providing data for fuel pricing and process optimization.

How did your company begin the process of ecological transformation?

We began our environmental transition by analyzing our company's impact, looking at everything from energy consumption and waste to emissions and our supply chain. After that, we defined clear, measurable sustainability targets and created a detailed roadmap to guide our efforts. We made sure to involve all our key stakeholders—our employees, suppliers, and customers—and focused on communicating our progress openly. To support our initiatives, we explored various green grants and funding opportunities. Our strategy was to start with low-cost, high-impact changes and then scale up over time. We continuously track our key environmental metrics to stay on course and sought out environmental certifications like ETV to validate all our hard work.

What environmental certifications or processes have you implemented in your company?

It took us about a year to get each certification, and we had the support of external consultants.

What resources (human, financial, technical) were necessary to carry out the transformation?

Our transition required a commitment of time and effort from internal experts and engaged employees, financial investment in new technologies and processes, and access to the necessary technical knowledge and tools. No external funds were used.

What new skills or competencies were necessary within your team?

We've developed several key skills to support our environmental transition. We've focused on data and impact analysis to accurately measure our environmental performance, and on strategic planning to integrate sustainability into our core business.
To create a more sustainable operation, we've improved our green supply chain management by sourcing eco-friendly materials. We've also boosted our ability in innovation and eco-design to redesign our products with sustainability as a priority.
Crucially, we've enhanced our communication skills to effectively engage all our stakeholders in our green initiatives. On the financial side, we've gained expertise in financial and risk analysis to evaluate green investments. Finally, we've built strong knowledge of regulatory and certification standards to ensure we comply with all environmental laws.
It took us over a year to develop these new skills within our team.

What were the main challenges or obstacles during the transformation?

We faced several significant challenges during our environmental transition. The main obstacles were limited budgets for green investments and an initial lack of internal expertise. We also struggled with time constraints, the uncertain return on investment for our green initiatives, and resistance to change from within the company.
Additional hurdles included unsupportive supply chains, complex regulations, and balancing customer demands with our sustainability goals. We also dealt with issues related to data collection, measurement, and limited access to the latest green technologies.
Ultimately, we overcame these challenges with the crucial support of external assistance, which provided the expertise and guidance we needed.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?"

We are not envisaging significant reactions yet.

What were the key success factors in achieving your environmental goals?

We achieved our environmental goals thanks to several key factors. Leadership commitment was crucial, as was setting clear and measurable targets. We made sure to involve and train our employees, fostering strong employee engagement.
A major factor was the integration of sustainability directly into our business strategy. We also recognized the importance of external knowledge, so we sought out and applied expert guidance. To keep our initiatives on track, we continuously monitored our progress and adjusted our plans as needed.
Collaboration with all our stakeholders, including suppliers and customers, was essential. We also used financial planning to support our projects, leveraging green financing and reinvesting any savings. We approached the entire process as a journey of continuous improvement and embraced innovation by leveraging new technologies and solutions.

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

On the financial front, we've achieved reduced energy, waste disposal, and maintenance costs by optimizing our use of resources. This has led to a more efficient and cost-effective operation.
From a business perspective, the transition has strengthened our market position. We're now attracting new customers and have improved public relations, which has led to stronger brand differentiation. Furthermore, our focus on sustainability has opened up access to new markets and driven the development of green products and services, creating new opportunities for growth.

Looking back, would you change anything in your approach to the transformation?

The main lesson learnt is that leaders need to allocate resources and hold the organization accountable.

What are your future plans regarding further environmental initiatives?

We aim to maintain our environmental efforts on sustainability, guaranteeing adequate human and financial resources.

Carborem

Company Size: Medium
Sector: Industrial process technology
Country: Italy
Website: https://www.greenthesisgroup.com/tecnologie-innovative/carborem-recovery-of-energy-and-materials/

Water Treatment and Monitoring

Description of the Technology Context :
The purpose is to sanitize and reduce the volume of sludge to dispose of with a low energy demanding process**.**

How did your company begin the process of ecological transformation?

Our environmental transition process followed the steps reported below:

- Analyze energy use, waste, emissions, and supply chain practices.
- Define realistic, measurable sustainability targets (e.g., carbon reduction, waste minimization).
- Develop a step-by-step roadmap with specific actions and timelines.
- Involve employees, suppliers, and customers; communicate progress clearly.
- Explore green grants, loans, and incentives to support initiatives.
- Start with low-cost, high-impact changes and scale up over time.
- Track key environmental metrics and adjust the strategy as needed.
- Seek environmental certifications (like ETV) to validate efforts.

What environmental certifications or processes have you implemented in your company?

We have introduced two main certification schemes:

- ISO 14001 (Environmental Management System - EMS): this is an internationally recognized standard that provides a framework for managing environmental aspects, reducing impacts, and improving environmental performance. It focuses on a systematic approach to environmental management rather than specific performance targets.
- EMAS (Eco-Management and Audit Scheme): this is a European Union scheme for companies and other organizations to evaluate, report on, and improve their environmental performance. It's considered more rigorous than ISO 14001, with a stronger emphasis on public reporting and employee involvement.

We spenta round one year to obtain each certification, also having the support of some external assistance.

What resources (human, financial, technical) were necessary to carry out the transformation?

Our transition required a commitment of time and effort from internal experts and engaged employees, financial investment in new technologies and processes, and access to the necessary technical knowledge and tools. External support, whether through hiring experts or leveraging grants and funding opportunities, significantly facilitated this process and helped us to overcome resource constraints.

What new skills or competencies were necessary within your team?

Key Skills needed for our environmental transition were:

1. Data & Impact Analysis – Measuring energy use, emissions, and environmental performance.
2. Strategic Planning – Integrating sustainability into business strategy and managing change.
3. Green Supply Chain Management – Sourcing eco-friendly materials and working with responsible suppliers.
4. Innovation & Eco-Design – Redesigning products/services with sustainability in mind.
5. Communication Skills – Engaging employees, customers, and stakeholders on green initiatives.
6. Financial & Risk Analysis – Assessing green investments and identifying sustainability risks.
7. Regulatory & Certification Knowledge – Complying with environmental laws and obtaining certifications.

We take more than one year to upskill our team.

What were the main challenges or obstacles during the transformation?

The main challenges were:

- Limited budget for green investments.
- Lack of expertise in sustainability.
- Time constraints and small teams.
- Uncertain ROI from green initiatives.
- Resistance to change within the company.
- Unsupportive supply chains.
- Complex regulations and compliance.
- Customer pressure vs. sustainability goals.
- Data and measurement issues.
- Limited access to green tech.

These challenges were mainly overcome through the support of some external assistance.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?"

Overal, our clients and suppliers complied with the SME's requests for more sustainable options but without actively embracing the change themselves.

What were the key success factors in achieving your environmental goals?

Main key success factors were:

- Leadership Commitment – Top-level buy-in and prioritization.
- Clear Goals – Measurable, achievable sustainability targets.
- Employee Engagement – Involve and train staff.
- Integration – Align sustainability with business strategy.
- Expertise – Seek external guidance or knowledge.
- Monitoring – Track progress and adjust plans.
- Collaboration – Work with stakeholders (suppliers, customers).
- Financial Planning – Use green financing and reinvest savings.
- Continuous Improvement – Sustainability is a long-term process.
- Innovation – Leverage tech and new solutions.

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

Our environmental transition resulted in the following benefits:

- Reduced Energy Costs
- Lower Waste Disposal Costs
- Optimized Resource Use
- Lower Maintenance Costs
- Attracting New Customers
- Improved Public Relations
- Stronger Brand Differentiation
- Access to New Markets
- Development of Green Products and Services
- Improved Relationships with Larger Businesses

Looking back, would you change anything in your approach to the transformation?

No.
The main lesson learnt is that without genuine and consistent support from the top, the environmental transition will likely falter. Leaders need to champion the cause, allocate resources, and hold the organization accountable.

What are your future plans regarding further environmental initiatives?

We are dedicated to sustaining our environmental actions by securing adequate human and financial support.

Company Size: Medium
Sector: Industrial process technology
Country: Italy
Website: https://www.cimberio.com/en/

Technology: SmartCIM system

Energy Technologies

Description of the Technology Context : SmartCIM transforms traditional HVAC valves into intelligent control nodes that precisely manage water flow and coordinate with other system components to deliver the exact amount of heating or cooling needed, minimizing losses and consumption.

How did your company begin the process of ecological transformation?

Our company's environmental transition was primarily driven by two key factors. First, we observed increasing demand from customers and market opportunities. Consumers and other businesses, especially larger ones within our supply chains, are increasingly seeking more sustainable products and services. This presented market opportunities for our SME if we embraced environmental responsibility. Second, the personal values and environmental awareness of our management team, as a family-owned business, served as a powerful driving force. We felt a personal obligation to operate more sustainably. As our sustainability efforts grew in complexity, we established a small working group specifically dedicated to environmental initiatives.

What environmental certifications or processes have you implemented in your company?

Initially, we opted not to pursue formal environmental certifications. Instead, we brought in **external experts** to help us set up effective environmental management processes.

What resources (human, financial, technical) were necessary to carry out the transformation?

Our transition required a blend of human, financial, and technical resources. The buy-in and active participation of all employees were crucial. This involved extensive communication, training, and fostering a culture of environmental awareness and responsibility. Our existing staff also needed to dedicate time to learning new processes, implementing changes, and monitoring environmental performance, which was a significant resource challenge for our busy SME. We didn't use any external funding.

What new skills or competencies were necessary within your team?

We enhanced our team's competencies through focused training on subjects like waste management, sustainable procurement, and using environmental data tracking tools. The key competencies developed included:

- Resource Efficiency Management: Skills in identifying and implementing strategies to reduce raw material waste, including energy auditing, water management techniques, and waste minimization practices.
- Waste Management and Circular Economy Principles: Understanding different waste streams, implementing proper segregation and recycling programs, and exploring opportunities for circular economy approaches (e.g., product reuse, remanufacturing).
- Life Cycle Assessment (LCA): A basic understanding of LCA to help assess the environmental impact of our products throughout their lifecycle.
- Sustainable Procurement: Skills in evaluating suppliers based on their environmental performance and sourcing more sustainable materials and services.
- Environmental Data Collection and Analysis: The ability to collect, track, and analyze environmental data (e.g., energy consumption, waste generation) to monitor progress and identify areas for improvement. This involved using new software or tools.
- Environmental Reporting and Communication: Skills in preparing environmental reports and effectively communicating our sustainability efforts both internally and externally.

What were the main challenges or obstacles during the transformation?

The main challenges we faced fell into a combination of these categories:

- Financial: Limited financial resources.
- Organizational: Lack of time and personnel, resistance to change, insufficient awareness, and difficulty in measuring and reporting impact.
- Technical: Complexity of regulations, supply chain issues, and a lack of adequate infrastructure.

We employed various strategies to overcome these challenges, such as:

- Utilizing Free or Low-Cost Resources: Leveraging publicly available information on Environmental Technology Verification (ETV), online tools, and free advisory services offered by the European Commission.
- Employee Engagement and Training: Investing in training to build internal capacity and fostering a culture of environmental responsibility, making the transition a collective effort.
- Focusing on Cost Savings: Highlighting the potential cost savings from resource efficiency to justify the initial investment.
- Strategically Seeking External Expertise: Engaging consultants for specific tasks where specialized knowledge was required, rather than hiring full-time experts.
- Learning from Peers: Studying successful examples of environmental transitions in similar SMEs and adapting their strategies.
- Highlighting Market Advantages: Capitalizing on the growing demand for sustainable products and services to attract environmentally conscious customers and gain a competitive edge.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?"

The general trend has been towards increasing support, particularly from clients and, increasingly, from investors and employees. Resistance was more likely to come from suppliers if there was a perceived negative impact on price or quality without a clear value proposition. Proactive engagement through communication and campaigns was crucial for fostering support and addressing potential resistance.

What were the key success factors in achieving your environmental goals?

The main key success factors were:

- Strong Leadership Commitment and Clear Environmental Vision and Goals: Defining specific, measurable, achievable, relevant, and time-bound (SMART) environmental goals provided direction and allowed us to track progress.
- Employee Engagement and Participation: The transition required the buy-in and active involvement of all employees. Creating a culture of environmental awareness, providing training, and empowering employees to contribute ideas and participate in initiatives was essential.
- Integration into Business Strategy: Environmental goals weren't treated as separate add-ons; instead, they were integrated into our core business strategy, influencing decisions related to product development, operations, marketing, and supply chain management.
- Focus on Tangible Benefits: Highlighting the concrete advantages of environmental initiatives, such as cost savings (through energy efficiency or waste reduction), improved brand reputation, enhanced customer loyalty, and potential for new market opportunities, built internal support and justified investments.

We didn't rely on external partnerships to gain access to resources and expertise.

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

Our environmental transition resulted in the following benefits:

- Reduced Energy Costs
- Lower Waste Disposal Costs
- Optimized Resource Use
- Lower Maintenance Costs
- Attracting New Customers
- Improved Public Relations
- Stronger Brand Differentiation
- Access to New Markets
- Development of Green Products and Services
- Improved Relationships with Larger Businesses

Looking back, would you change anything in your approach to the transformation?

No.
Looking back, here's what we would do differently:

- Develop a More Detailed Baseline and Measurement Plan Early On: We would invest more time and effort in establishing a clear baseline of our environmental footprint (e.g., energy consumption, waste generation, water usage) before implementing major changes. We'd also put a robust system in place for measuring and tracking progress from the outset. This would allow for better evaluation of our initiatives' impact and more informed decision-making.
- Explore External Funding and Support More Aggressively: We would dedicate more time and resources to thoroughly researching and applying for available grants, subsidies, and support programs at the local (Italian), regional, and EU levels.

What are your future plans regarding further environmental initiatives?

We are dedicated to sustaining our environmental actions by securing adequate human and financial support.

Deref

Company Size: Medium
Sector: Industrial process technology
Country: Italy
Website: https://www.deref.com/it/

The name of technology: ReStoRe

Description of the Technology Context:
The ReStoRe process involves treating steelmaking residues to selectively dissolve and remove lime and other slag components, allowing for their reduction in future steel production while recovering valuable metals from the waste.

How did your company begin the process of ecological transformation?

The following main factors triggered to begin our environmental transition:

- Customer Demand and Market Opportunities: increasingly, consumers and other businesses (especially larger ones in their supply chains) are demanding more sustainable products and services. This can create market opportunities for SMEs that embrace environmental responsibility.
- Personal Values of the management team: the personal values and environmental awareness of the family-owned businesses and management team can be a strong driving force. They feel a personal responsibility to operate in a more sustainable way.

As the sustainability efforts become more complex, a small working group focused on environmental initiatives was formed.

What environmental certifications or processes have you implemented in your company?

We choosed not to pursue formal certification initially, but we engaged external expertise for setting up effective environmental management processes.

What resources (human, financial, technical) were necessary to carry out the transformation?

A combination of human, financial, and technical resources was essential.
Our transition requires the buy-in and participation of all employees. This involved communication, training, and fostering a culture of environmental awareness and responsibility.
Existing staff also needed to dedicate time to learning about new processes, implementing changes, and monitoring environmental performance. This can be a significant resource constraint for busy SMEs.
No external funds were used.

What new skills or competencies were necessary within your team?

The following competencies were improved through focused training on topics like waste management, sustainable procurement, and using environmental data tracking tools:

- Resource Efficiency Management: skills in identifying and implementing strategies to reduce raw material waste. This includes energy auditing, water management techniques, and waste minimization practices.
- Waste Management and Circular Economy Principles: understanding different waste streams, implementing proper segregation and recycling programs, and exploring opportunities for circular economy approaches (e.g., product reuse, remanufacturing).
- Life Cycle Assessment (LCA): a basic understanding of LCA to help assess the environmental impact of our products throughout their lifecycle.
- Sustainable Procurement: skills in evaluating suppliers based on their environmental performance and sourcing more sustainable materials and services.
- Environmental Data Collection and Analysis: the ability to collect, track, and analyze environmental data (e.g., energy consumption, waste generation) to monitor progress and identify areas for improvement. This involved using new software or tools.
- Environmental Reporting and Communication: skills in preparing environmental reports and effectively communicating the sustainability efforts internally and externally.

What were the main challenges or obstacles during the transformation?

The main challenges felt into a combination of these categories:

- Financial: limited financial resource;
- Organizational: lack of time and personnel, resistance to change, lack of awareness, difficulty in measuring and reporting impact.
- Technical: complexity of regulations, supply chain issues, lack of infrastructure.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?

The general trend is towards increasing support, particularly from clients and increasingly from investors and employees. Resistance was more likely to come from suppliers if there's a perceived negative impact on price or quality without a clear value proposition.
Proactive engagement through communication and campaigns was crucial for fostering support and addressing potential resistance.

What were the key success factors in achieving your environmental goals?

Main key success factors were:

- Strong Leadership Commitment and Clear Environmental Vision and Goals: defining specific, measurable, achievable, relevant, and time-bound (SMART) environmental goals provided direction and allowed us the to track progress.
- Employee Engagement and Participation: the transition requirer the buy-in and active involvement of all employees. Creating a culture of environmental awareness, providing training, and empowering employees to contribute ideas and participate in initiatives was essential.
- Integration into Business Strategy: environmental goals were not be treated as separate add-ons but rather integrated into the core business strategy, influencing decisions related to product development, operations, marketing, and supply chain management.
- Focus on Tangible Benefits: highlighting the tangible benefits of environmental initiatives, such as cost savings (through energy efficiency or waste reduction), improved brand reputation, enhanced customer loyalty, and potential for new market opportunities, built internal support and justified investments.

No external partnerships provided access to resources and expertise.

Have any measurable benefits emerged following the transformation (e.g., financial savings, improved reputation)?

- Our environmental transition was not just an ethical imperative but a sound business strategy that yielded measurable financial benefits, enhanced reputation, and unlocked new opportunities for growth and innovation.

Looking back, would you change anything in your approach to the transformation?

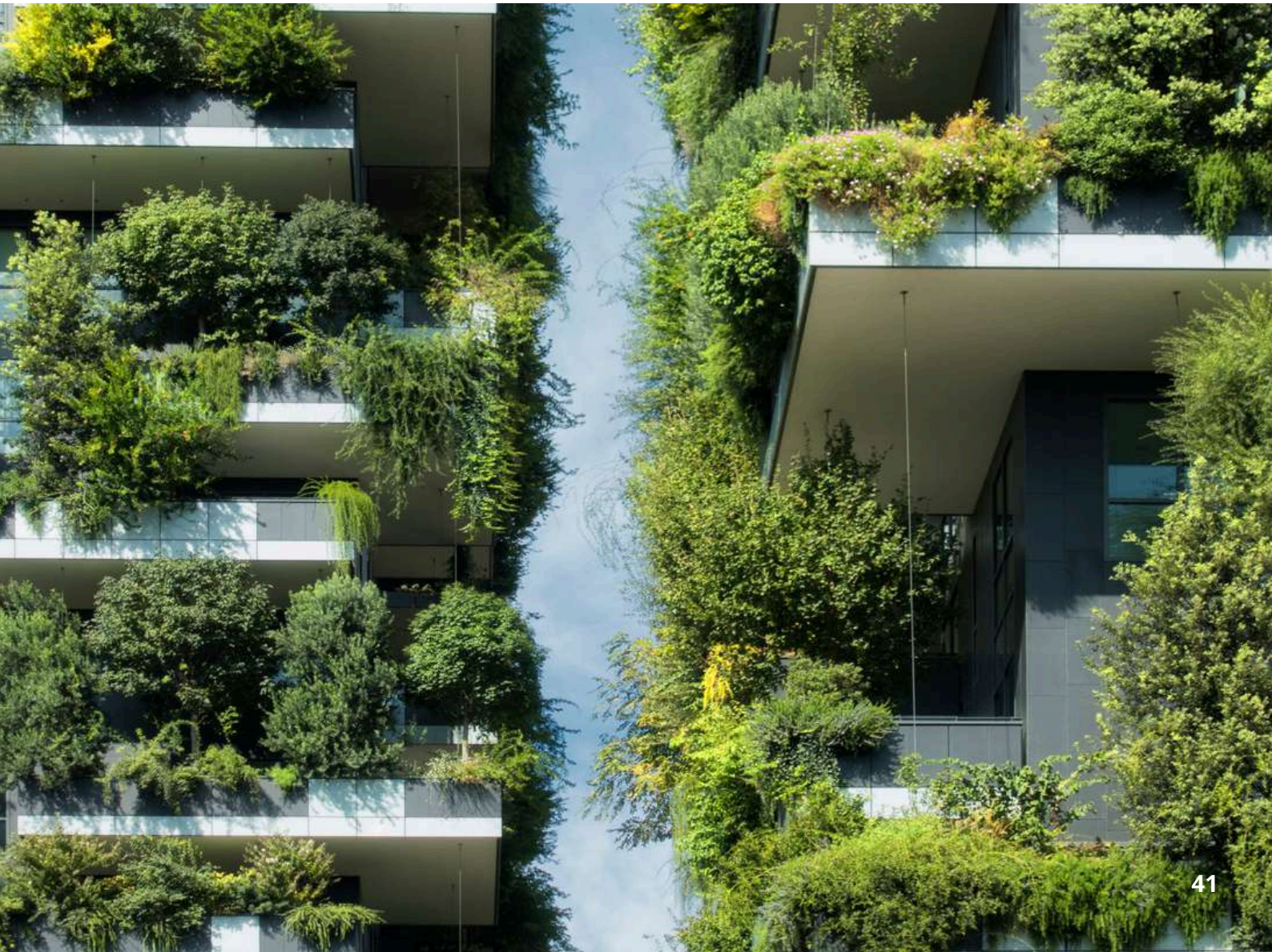
Here's what I would do differently:

- Develop a More Detailed Baseline and Measurement Plan Early: we would invest more time and effort in establishing a clear baseline of our environmental footprint (e.g., energy consumption, waste generation, water usage) before implementing major changes. We would also put in place a robust system for measuring and tracking progress from the outset. This would allow for better evaluation of the impact of our initiatives and more informed decision-making.
- Explore External Funding and Support More Aggressively: we would dedicate more time and resources to thoroughly researching and applying for available grants, subsidies, and support programs at the local (Italian), regional, and EU levels.

What are your future plans regarding further environmental initiatives?

Future plans for further environmental improvementaions are mainly related to Circular Economy principles:

- shifting from selling products to offering them as a service (e.g., leasing equipment) to encourage durability and reuse.
- exploring ways to turn waste streams into valuable resources, either for internal use or as inputs for other businesses. This could involve composting organic waste, using manufacturing byproducts as raw materials, or partnering with specialized recycling companies.
- designing products that are longer-lasting, easier to repair, and can be upgraded, reducing the need for frequent replacements.
- implementing systems for customers to return end-of-life products for reuse, refurbishment, or recycling.



Company Size: Medium
Sector: technology for polygeneration processing of sewage sludge
Country: Italy
Website: https://www.hbigroup.it/

Water Treatment and Monitoring

The name of technology: Eva mini

Description of the Technology Context:
Eva Mini is an advanced hydrothermal treatment (HTC) technology designed to make wastewater treatment more sustainable by reducing sludge volume by at least 80%, eliminating gaseous emissions and odors, recovering water from sludge, and enabling flexible process conditions tailored to sludge characteristics.

How did your company begin the process of ecological transformation?

The following two main factors triggered to begin our environmental transition:

- the need to differentiate ourselves in the market by offering "greener" products or services, attracting environmentally conscious customers and potentially gaining a competitive edge.
- consumers and other businesses are demanding more sustainable products and services.

Thus, external Pressure can be summarised as follow: direct customer demand for sustainable products or services; requirements from larger business partners; pressure from industry-specific organizations promoting sustainability; competitors adopting sustainable practices.

What environmental certifications or processes have you implemented in your company?

Only the ETV certification was obtained.

What resources (human, financial, technical) were necessary to carry out the transformation?

The resources directly involved were mainly top management, responsible for implementing changes in processes and resource use, and technical experts, responsible for overseeing the development and maintenance of ETV certification.
No external supports or funds were used.

What new skills or competencies were necessary within your team?

The environmental transition required a commitment of time and effort from engaged employees, financial investment in the new technology, and access to the necessary technical tools.
Essential resources were:

- Employee engagement: a successful transition required the buy-in and participation of all employees. This involved training and fostering a culture of environmental awareness and responsibility.
- Initial investment: implementing technical changes required upfront investment, equipment upgrades (e.g., energy-efficient lighting, machinery), waste management systems, and process modifications.
- Operational costs: sustainable practices lead to increased operational costs initially, before long-term savings are obtained.
- Training costs: investing in training staff on new environmental practices and technologies was essential.
- Technology and equipment: adopting cleaner technologies required specific technical resources.
- Software and tools: various software and tools were necessary to assist with environmental management, carbon accounting, and reporting.

What were the main challenges or obstacles during the transformation?

The main challenges felt into a combination of these categories:

- Lack of time and personnel: dedicating time and personnel to research, plan, and implement environmental initiatives can be difficult without disrupting daily operations.
- Uncertainty about Return on Investment (ROI): the financial benefits were not immediately clear or were perceived as long-term and uncertain.
- Complexity of regulations and Information: navigating the complex landscape of ETV scheme and identifying relevant information and support can be overwhelming for SMEs.
- Resistance to change: employees initisally resisted the new or technology associated with ETV scheme, especially since they perceived it as adding workload or complexity.
- Difficulty in measuring and reporting Impact: we initially lacked the tools and expertise to effectively measure the environmental impact and track progress, making it difficult to demonstrate the benefits of our efforts

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?

Generally, clients are becoming increasingly supportive of environmentally responsible businesses. This trend is driven by growing consumer awareness of environmental issues and a desire to support sustainable products and services.
Local community appreciated our engagement in reducing our environmental footprint. Investors saw sustainability as a long-term value driver. Regulatory bodies were supportive of our initiatives to exceed environmental standards.
Employees felt more engaged and proud to work for a company that values sustainability.
Proactive engagement through communication and campaigns was crucial for addressing resistance.

What were the key success factors for achieving your environmental goals?

Leadership commitment was the most crucial factor, since this commitment translated into resource allocation, strategic prioritization, and the integration of environmental goals into the company's overall vision and values.
Secondly, employee engagement was also important, creating a culture of environmental awareness.
Then, regularly communicating our environmental goals, initiatives, and progress to employees, customers, suppliers, and other stakeholders built trust and encouraged support.
A mindset of continuous improvement was also developed, regularly monitoring environmental performance, learning from successes and failures, and adapting strategies as needed for long-term success. At this purpose, a phased approach that prioritized high-impact, low-cost measures initially and gradually scales up more ambitious initiatives was more successful than trying to do everything at once.
Finally, the ETV scheme required to establish clear metrics to track environmental performance and regularly monitor progress against the set goals. This was essential for accountability and identifying areas for improvement.

Have there been measurable benefits (e.g., financial savings, improved reputation) following the transition?

The following savings were envisaged:

- Lower Waste Disposal Costs: implementing waste reduction and recycling technology decreased the volume of waste sent to landfills, resulting in lower disposal fees.
- Lower Maintenance Costs: investing in more durable and energy-efficient equipment lead to lower long-term maintenance costs.
- Improved Reputation and Brand Image.
- Enhanced Customer Loyalty: environmentally conscious consumers increasingly preferred to support our businesses with strong sustainability credentials.
- Attracting New Customers: a positive environmental reputation attracted new customers who prioritize sustainability in their purchasing decisions.

Looking back, would you change anything in your transition approach?

We would do differently the following two aspects:

- Prioritise communication: we would focus on implementing and showcasing some quick, visible, and cost-effective "wins" early on. Communicating these early successes clearly to employees and even customers can build momentum and buy-in for more significant changes later.
- Invest more in initial training and awareness: we would allocate more resources upfront for comprehensive training and awareness programs for all employees. Ensuring everyone understands the "why" behind the transition and how they can contribute is crucial for long-term engagement and the successful adoption of new practices. This would go beyond just telling them what to do and focus on fostering a genuine understanding of environmental principles.

What are your future plans regarding further environmental improvements?

For an SME in Italy, aligning internal plans with the national Recovery and Resilience Plan (PNRR) and the EU Green Deal is crucial to access potential funding and support mechanisms. Furthermore, emphasising the "Made in Italy" brand with a focus on sustainability can be a powerful differentiator in the global market.
The key will be to provide SMEs with accessible, affordable, and practical tools, knowledge, and connections to navigate the environmental transition successfully and contribute to a greener future for Italy and Europe.
We plan to maintain our initiatives mainly ensuring that environmental initiatives have dedicated financial and human resources

Company Size: Medium
Sector: Industry
Country: Italy
Website: https://www.pozzoliambiente.com/

Water Treatment and Monitoring

Description of the Technology Context:
The VRT system is a technology designed to prevent the infiltration of rainwater and groundwater into underground fuel tank areas by continuously extracting and purifying hydrocarbon-contaminated water from manholes and other confined spaces.

How did your company begin the process of ecological transformation?

Our company began the ecological transformation process by identifying key environmental risks associated with fuel storage sites, such as the infiltration of rainwater and potential contamination of groundwater. This led to the development of the VRT – Vacuum Rain Tank system, designed to collect and treat rainwater contaminated with hydrocarbons before it can reach the environment. The initiative was driven by a commitment to sustainable water management and compliance with EU environmental regulations.

What environmental certifications or processes have you implemented in your company?

We have implemented rigorous environmental monitoring and water treatment processes, particularly in the management of rainwater from underground fuel tanks. While the VRT system itself is newly developed and undergoing verification, it has been designed to meet relevant EU environmental standards for water quality, hydrocarbons, and suspended solids. These processes ensure that our operations minimize contamination risks and comply with legal requirements.

What resources (human, financial, technical) were necessary to carry out the transformation?

The ecological transformation required a multidisciplinary team including engineers, environmental specialists, and technical staff for design, implementation, and testing of the VRT system. Financial resources were allocated for research, development, and installation of the system at pilot sites. Technical resources included specialized equipment for vacuum suction, oil separation, and water quality monitoring, ensuring that treated rainwater meets regulatory standards before discharge.

What new skills or competencies were necessary within your team?

- The development and implementation of the VRT system required new competencies in environmental engineering, hydrocarbon-contaminated water treatment, and vacuum suction technologies. Team members also needed to strengthen their knowledge in regulatory compliance for water quality and gain skills in system monitoring, data collection, and performance verification.

What were the main challenges or obstacles during the transformation?

The main challenges included designing a system capable of reliably treating rainwater with varying hydrocarbon concentrations and ensuring continuous operation in confined spaces such as underground fuel tanks. Additionally, collecting sufficient field data for verification and demonstrating compliance with environmental regulations were key obstacles that required careful planning and testing.

How did customers, suppliers, and other stakeholders respond to your environmental initiatives?

The main challenges included designing a system capable of reliably treating rainwater with varying hydrocarbon concentrations and ensuring continuous operation in confined spaces such as underground fuel tanks. Additionally, collecting sufficient field data for verification and demonstrating compliance with environmental regulations were key obstacles that required careful planning and testing.

What were the key success factors for achieving your environmental goals?

The key success factors included a strong commitment to environmental protection within the company, the development of innovative technology (the VRT system) tailored to address specific risks of rainwater contamination, and the active involvement of a multidisciplinary team with expertise in environmental engineering, water treatment, and regulatory compliance. Additionally, careful planning, continuous monitoring, and collaboration with stakeholders ensured that the system met legal requirements and delivered measurable environmental benefits.

Have there been measurable benefits (e.g., financial savings, improved reputation) following the transition?

Yes, the implementation of the VRT system has led to measurable benefits. Environmentally, it prevents contamination of soil and groundwater, ensuring full compliance with regulations. From a business perspective, it has enhanced the company's reputation as an environmentally responsible and innovative provider of water treatment solutions. Additionally, by reducing the risk of environmental incidents, the system contributes to potential cost savings related to cleanup, fines, or remediation measures.

Looking back, would you change anything in your transition approach?

Overall, we are happy with how we carried out the environmental transition. If we could do it again, we might spend more time on early field tests to check and improve the system faster and show stakeholders the environmental results sooner.

What are your future plans regarding further environmental improvements?

Our future plans include expanding the use of environmentally-friendly technologies across more sites, improving water treatment efficiency, and reducing the environmental impact of operations even further. We also aim to continue monitoring and optimizing our processes, exploring new solutions for sustainable water management, and maintaining full compliance with evolving environmental regulations.

5.Cross-Case Analysis from the case studies

Cross-case analysis from the case studies

The analysis of case studies across Small and Medium-sized Enterprises (SMEs) reveals both common patterns and contextual differences in how organizations approach their environmental transition. While each SME's pathway is shaped by its size, sector, and culture, several cross-cutting themes can be identified. These themes highlight the shared drivers, resources, challenges, and outcomes that define the process of adopting greener practices.

1. Triggers and Key Initiators

The starting point for SMEs in their environmental transition is often influenced by a combination of internal and external pressures. Cost savings, regulatory compliance, and customer demand emerge as strong external motivators, while the personal values of the owner or manager frequently provide the internal spark. Given the centralized decision-making typical of SMEs, leadership plays a decisive role in initiating the process. In some cases, "green champions" within staff or small working groups act as catalysts, though long-term success depends heavily on top-level commitment.

2. Certification and Processes

SMEs across cases demonstrate diverse approaches to formalizing their environmental practices. ISO 14001 and EMAS stand out as widely recognized standards, while sector-specific certifications (e.g., FSC, OEKO-TEX®, Fair Trade) and emerging frameworks like B Corp add credibility and market advantage. However, the time and cost involved in certification processes vary significantly, often requiring external consultancy support. Not all SMEs pursue formal certification; many begin with internal processes such as waste reduction programs or energy efficiency initiatives as stepping stones toward more comprehensive systems.

3. Resources and Competencies

Environmental transition requires a careful balance of human, financial, and technical resources. Common across the case studies is the reliance on a dedicated individual (often the owner) supported by engaged employees. Financial constraints remain the most cited obstacle, particularly when upfront investments in technology, equipment, or certification are required. On the technical side, SMEs often lack in-house expertise and depend on consultants, industry networks, or publicly funded programs. Developing new competencies—from environmental awareness to data management and sustainable procurement—is essential. Training methods differ, but most cases highlight the importance of continuous learning and embedding sustainability into company culture.

Cross-case analysis from the case studies

4. Challenges and Obstacles

Despite differences in sector or geography, SMEs consistently face similar barriers: limited budgets, lack of technical expertise, time constraints, and uncertainty around return on investment. Regulatory complexity and resistance to change further complicate progress. Yet, case studies also illustrate that phased implementation (starting with low-cost, high-impact measures) and collaborative networks (peer learning, partnerships with universities, or industry associations) can help overcome these barriers. Leadership commitment again emerges as the most critical factor in navigating these challenges.

5. Stakeholder Reactions

Stakeholder responses tend to be supportive, particularly among clients and local communities, who increasingly reward sustainable practices with loyalty and trust. Suppliers' reactions vary: some embrace collaboration, while others resist due to cost or capability limitations. Regulatory bodies and investors generally respond positively, with growing emphasis on sustainability as a driver of long-term resilience. Effective communication—through transparency, storytelling, and stakeholder engagement—is a unifying factor across cases in securing support.

6. Success Factors and Benefits

The case studies highlight key success factors: strong leadership, clear vision and measurable goals, employee engagement, and integration of sustainability into the business model. SMEs that succeed in their transition report tangible benefits: cost reductions (energy, water, waste), improved reputation, enhanced customer loyalty, and access to new markets. Less expected but equally significant outcomes include increased innovation, improved operational efficiency, stronger employee morale, and greater resilience against external shocks.

Cross-case analysis from the case studies

7. Lessons Learned and Future Directions

A recurring theme across cases is the recognition that SMEs would, if starting again, place greater emphasis on early wins, comprehensive training, and robust measurement systems. Engaging suppliers earlier, seeking external funding more proactively, and embedding sustainability into the core business model are also lessons repeatedly cited. Looking forward, SMEs plan to adopt circular economy principles, renewable energy investments, digital monitoring tools, and science-based carbon targets. These strategies not only deepen the environmental transition but also position SMEs as active contributors to Europe's green transformation.

8. Cross-case Synthesis

In synthesis, the case studies demonstrate that while SMEs operate with inherent constraints, they also display remarkable adaptability and innovation. Environmental transition is most effective when leadership commitment aligns with stakeholder expectations and when SMEs leverage both incremental steps and external partnerships. Certification and formal frameworks can accelerate credibility, but the foundation lies in cultivating a culture of sustainability through people, processes, and continuous improvement.

Ultimately, the analysis confirms that the environmental transition is not merely a compliance-driven necessity but a strategic opportunity for SMEs to enhance competitiveness, resilience, and social legitimacy. By aligning financial, human, and technical resources with a clear vision, SMEs can transform constraints into catalysts for long-term sustainable growth.

6.Implications for VET providers and SME leaders

The collected case studies and interviews provide valuable insights for both VET providers and SME leaders who wish to support or implement environmental transition processes based on ETV. By analyzing these cases, common themes can be identified that are crucial for understanding how SMEs approach sustainability issues and how educational programs can respond to their needs.

For VET providers, the main implication is the need to offer comprehensive training that goes beyond technical skills alone. SMEs require competencies in environmental impact assessment, data analysis,, sustainable supply chain management, and regulatory compliance. Equally important are soft skills such as effective communication, stakeholder engagement, leadership, and change management. Training programs should prepare participants to support companies in overcoming technical, organizational, and strategic challenges, enabling them to make a tangible contribution to achieving measurable environmental outcomes.

For SME leaders, insights from the case studies highlight the importance of a strategic and structured approach to environmental initiatives. Successful transformation often begins with a thorough assessment of the company's environmental impact, followed by setting clear objectives and developing an actionable roadmap. Key success factors include leadership commitment, active employee involvement, and continuous monitoring of progress. It is also important to implement changes in stages—starting with high-impact, low-cost actions—and to remain open to external support to overcome technical or regulatory barriers.

The interviews also emphasize the significance of resources and skills development. SMEs need to invest in human, financial, and technical capital to support sustainability initiatives while simultaneously developing internal competencies in areas such as financial and risk analysis, innovation, and regulatory knowledge. Common challenges, such as resistance to change, budget limitations, or limited access to technology, require strategic planning, collaboration, and, in some cases, external support.

Finally, the cases demonstrate that environmental transformation can deliver tangible benefits beyond regulatory compliance, including cost savings, increased operational efficiency, strengthened market position, and opportunities for innovation. For VET providers, this underscores the value of combining theoretical knowledge with business practice. For SME leaders, it highlights the potential of sustainability initiatives as a source of growth, resilience, and competitiveness. By analyzing these insights, readers can better understand which strategies, skills, and resources are critical for supporting successful environmental transitions in SMEs and can appropriately adapt training programs and management approaches.

7.Suggestions for future support and training

Vet trainers and SME leaders can develop their skills through:

1. **Using Success Stories Compedium**

VET Trainers: During sessions, discuss one case study per session and encourage participants to identify specific actions that SMEs could implement in their own companies.

SME Leaders: Select a case study from your sector and create a list of 3–5 actions that you could test in your company over the next six months.

2. **Deepening Knowledge of ETV**

VET Trainers: Organize mini-workshops demonstrating how to use ETV tools to evaluate environmental technologies in companies. Example: analyze a simple technology using ETV criteria.

SME Leaders: Use the ETV guides available within the project to create a list of technologies in your company that are worth verifying or implementing.

3. **Creating a Personalized Transformation Plan**

VET Trainers: Guide participants step by step in creating a green transformation plan for a sample company, with specific deadlines and measurable indicators.

SME Leaders: Develop your own action plan, e.g., "Reduce energy consumption by 10% within 12 months," using progress monitoring tools available in the project materials and external resources.

4. **Knowledge Sharing and Networking**

VET Trainers and SME Leaders: Participate in webinars, discussion groups, and online project platforms. The goal is to exchange experiences and find partners for joint ecological initiatives.

Example action: Organize a mini "Best Practice Sharing" session within your organization or in a local SME cluster once per quarter.

5. **Utilizing the Full Range of Project Materials**

VET Trainers: Integrate different project resources (case studies, guides, workshop recordings) into your training programs

SME Leaders: Use the materials to train your teams and prepare short internal presentations demonstrating the benefits of ETV and eco-innovation.

Additional Recommendation: Take advantage of external sources and complementary materials, such as action plans available within the project results, as well as transformation processes and tools offered by the L2C (Linear to Circular) and 2good2go.eu Erasmus + projects, all accessible on the project website. These resources can provide practical guidance for accelerating sustainable practices in your company and training programs.

Quick scan of ETV companies

Introduction

The **Environmental Technology Verification (ETV)** program was a European Union initiative designed to support Small and Medium-sized Enterprises (SMEs) in proving the performance and reliability of their innovative environmental technologies. The program operated across three main ETV areas: **Water Treatment and Monitoring, Materials, Waste, and Resources, and Energy Technologies.** By providing independent and science-based verification, ETV aimed to accelerate the commercialization of green innovations and increase trust among customers, investors, and regulatory bodies. For many SMEs, participation in the ETV program was a strategic response to rising energy costs, stricter environmental regulations, and growing customer demand for sustainable solutions. Verified technologies gained a competitive edge by demonstrating measurable environmental and economic benefits, such as reduced energy consumption, lower emissions, and improved resource efficiency.

The **ETV scheme helped SMEs** address several challenges related to financial constraints, technical expertise, and market acceptance. Through independent performance claims verification, SMEs could prove that their technologies met high environmental and operational standards, which facilitated access to new markets and funding opportunities.

Across the three ETV areas, the program supported technologies such as water purification systems, air quality monitoring solutions, energy efficiency technologies, renewable energy equipment, and innovative waste recycling processes. By validating real-world performance data, ETV reduced uncertainty for customers and decision-makers, making it easier to select and adopt environmentally friendly technologies. Although the ETV program is no longer active, its impact on participating SMEs was significant. It increased the visibility of green technologies, provided evidence-based credibility, and laid the groundwork for future sustainability initiatives across Europe.

The lessons learned from ETV continue to influence current approaches to environmental technology development, verification, and market adoption. The **Quick Scan View** aims to provide a **fast, organized overview of all companies described in the guide that possess ETV-verified technologies, highlighting the technologies applied and thereby giving other companies insight into the types of innovations implemented.** This allows users to quickly understand the available solutions and compare their functionalities. The overview also facilitates the identification of potential technology partners or sources of inspiration for one's own innovative activities. The information presented in the Quick Scan View supports investment and strategic decision-making by providing reliable data on verified technologies.

Co-funded by
the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	*Asket*
	website	https://asket.pl

Identification of the technology	*Name of the technology* *(technology can be a product, a process or a service)*	BIOMASSER
	Technology Area	Energy Technologies / Renewable Energy

Description of the Technology	*Context* *(specific problem(s) or opportunities the technology wishes to address)*	Context (specific problem(s) or opportunities the technology wishes to address): The BIOMASSER technology enables the processing of local, non-wood biomass into renewable fuel in the form of briquettes. It addresses the problem of low profitability and difficulties in utilizing wet biomass, eliminating the need for drying.
	Main purpose of the technology *(how does the technology address the problems or opportunities?)*	Enables the production of fuel briquettes from local agricultural residues and plant waste with moisture content of 10–30%, supporting sustainable energy and a circular economy.
	Principle used *(which are the scientific or technical references of the technology)*	Two-stage process – shredding biomass to 1–5 cm fractions and pressing into high-density briquettes ready for use without additional drying.
	Which are the main claim(s) on the technology's performance that could be verified?	- Production of briquettes from biomass with moisture content of 10–30% - Mechanical durability ≥ 80% - Energy consumption 60–80 kWh/ton - Capacity up to 90 kg/h for the BSX14 Solo model
	Under which conditions is this performance(s) achieved? *(key operational parameters and limits in order for the technology to perform)*	Operational conditions: Ambient temperature +5°C to +30°C, non-wood biomass such as straw, hay, reeds, alfalfa, Miscanthus and other plant materials.
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	Technology parameters confirmed by the European Environmental Technology Verification (ETV) Statement No. VN20140001.

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Poland, EU, global
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	Animal bedding, fuel for boilers, heating material for fireplaces, reduction of agricultural waste.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market (novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)	Capability to briquette biomass with up to 30% moisture content, modular BIOMASSER line design, mobile and stationary versions, low operating costs.

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	Briquettes from biomass reduce CO2 emissions, support the circular economy, reduce fossil fuel consumption and agricultural waste.

Co-funded by
the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	IRIDRA srl
	website	https://www.iridra.com/

Identification of the technology	*Name of the technology* *(technology can be a product, a process or a service)*	HYDRO-1
	Technology Area	Water Treatment and Monitoring

Description of the Technology	*Context* *(specific problem(s) or opportunities the technology wishes to address)*	The system enables to reclaim a large amount of water and nutrients (TN and TP) that, if coupled with a disinfection unit (e.g. UV irradiation), can be reused in agriculture.
	Main purpose of the technology *(how does the technology address the problems or opportunities?)*	HYDRO-1 technology allows obtaining a treated effluent that is suitable to be reused for irrigation purposes.
	Principle used *(which are the scientific or technical references of the technology)*	HYDRO-1 technology is based on two processes: an anaerobic treatment followed by nature-based solutions (NBS) with constructed wetland (CW).
	Which are the main claim(s) on the technology's performance that could be verified?	The main parameters that can be verified are: (i) performance parameters: COD, TSS, BOD5, Turbidity, N-NH4, TN, sludge, biogas production; (ii) operational parameters: flow inlet, pH, Temperature, precipitation, pressure (biogas collection).
	Under which conditions is this performance(s) achieved? *(key operational parameters and limits in order for the technology to perform)*	The performance claims are intended to be robust against change of conditions that could be encountered in touristic areas of the Mediterranean region between winter (cold humid climate and lower number of residents) and summer (hot arid climate and higher number of residents, increased by the anticipated tourism).
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	The aim of the applied technology is to guarantee "class A" requirements for wastewater reuse in irrigation in terms of TSS, BOD_5, and turbidity, according to the EU Regulation 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse in agriculture. Moreover, the integrated system also claims effective removal of COD and nitrification.

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	HYDRO-1 system provides a solution for public and private commercial activities in the agricultural sector.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market *(novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)*	The solution is suitable to remove organic and solid loads, as well as to provide partial denitrification, if nitrate nitrogen is available..

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	The system can permit a reuse and recover of water and nutrients with minimum operational and maintenance cost in comparison to conventional technologies for the cultivation of all the crop categories. Finally, biogas from anaerobic process can be also collected and reused.

Co-funded by
the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	Inray Oy Ltd
	website	www.inray.fi

Identification of the technology	*Name of the technology (technology can be a product, a process or a service)*	FUELCONTROL®
	Technology Area	Energy Technologies

Description of the Technology	*Context (specific problem(s) or opportunities the technology wishes to address)*	The technology is a real-time measurement system, which can continuously measure the quality of solid fuels using X-ray technology.
	Main purpose of the technology (how does the technology address the problems or opportunities?)	The system determines fuel moisture concentration, detects foreign objects and can calculate foreign matter concentrations and energy content, when transported by a conveyor belt or conveyor scraper. The system produces real-time fuel quality data that can be utilized in e.g. fuel pricing and process optimisation.
	Principle used (which are the scientific or technical references of the technology)	The measurement is based on X-ray scanning where the radiation is generated from an electronic radiation source. During the measurement, radiation is directed through the fuel flow and the permeating radiation is measured using a sensor with large resolution. The measurement data provided by the sensor is used to form X-ray images, which in turn are analysed in real-time to measure moisture and concentrations of foreign substances, in addition to identifying e.g. foreign objects with a greater density than the fuel (metals, rocks etc.).
	Which are the main claim(s) on the technology's performance that could be verified?	The methods used includes: - Sampling of the biofuels for analysing the moisture content according to EN ISO 18135:2017. - Analysis of moisture content according to EN ISO 18134-2:2017. - Testing for foreign objects by manual adding a fixed number of stones and steel nuts to the fuel on the conveyor prior to the measuring place.
	Under which conditions is this performance(s) achieved? (key operational parameters and limits in order for the technology to perform)	The solid biofuels must be present in a form and size as chips and sawdust and must be transported on a conveyer belt or a conveyer scraper, where the system are mounted above the conveyer.

		Detection of moisture and foreign objects depends on width and depths of the fuel layer on the conveyer, and the initial performance claims is for a fuel depth up to 600 mm.
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	The precision for the samples is calculated according to the standard for analysing moisture content in EN ISO 18134:2017.

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	The technology is applicable for medium-sized and large power plants, fuel suppliers, and bio-refineries who wish to improve their production.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market *(novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)*	Key innovative features of the system are: - Real-time measurement of moisture, foreign matter and volume flow. - Total survey (not based on samples); measures everything carried on the conveyor. - Compatible with all modern automation and management systems. - Safe source of electromagnetic radiation and extensive safety arrangements.

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	The system can provide savings in a wide range of areas: - Fuel expenses: Calculates the energy content per load, taking into consideration the impurities of the fuel in addition to moisture. - Operating cost: Fuel quality variation causes production losses and other extra expenses. Most of this can be avoided through the utilization of real-time quality control. - Sampling and analysis costs: The thousands of samples often required each year are a significant labour and analysing expense. The need for samples and analyses can be reduced to a fraction of this.

		- Ash treatment costs: The amount of ash from the boiler may be reduced if the measured content of impurities and large object in each truck shows high content from specific suppliers and they can be induced to reduce the content of impurities. - Maintenance costs: Can reduce content of impurities and large objects (stone and metal) reduces wear and breakdown in the fuel handling system (conveyers, crushers, screens etc.), and conse-quently maintenance cost are lowered. - Emissions: Sudden variations in fuel quality can cause variations in the combustion efficiency in the boiler and increase the emissions of carbon monoxide and unburned volatile organic compounds. Consistent quality of fuel allows for more control of combustions efficiency which keeps emissions low and saves equipment maintenance costs.

Co-funded by the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	CARBOREM srl
	website	https://www.greenthesisgroup.com/tecnologie-innovative/carborem-recovery-of-energy-and-materials/

Identification of the technology	*Name of the technology* *(technology can be a product, a process or a service)*	CARBOREM TECHNOLOGY
	Technology Area	Water Treatment and Monitoring

Description of the Technology	*Context* *(specific problem(s) or opportunities the technology wishes to address)*	The purpose is to sanitize and reduce the volume of sludge to dispose of with a low energy demanding process.
	Main purpose of the technology *(how does the technology address the problems or opportunities?)*	The process aims at sanitizing sewage sludge, reducing the amount of pathogens and the concentration of the total suspended solid.
	Principle used *(which are the scientific or technical references of the technology)*	Carborem technology is based on Hydrothermal Conversion (also called Hydrothermal Carbonization or HTC), an innovative process treating sewage sludge in a continuous mode at 180-190 °C and 9-14 bar, in about one hour.
	Which are the main claim(s) on the technology's performance that could be verified?	In about one hour the sludge is sanitized and converted into a liquid recycled into anaerobic digester and into a solid with no pathogens, rich in carbon and phosphorus and with reduced amount of polyaromatic hydrocarbons (PAHs).
	Under which conditions is this performance(s) achieved? *(key operational parameters and limits in order for the technology to perform)*	Carborem technology is a continuous process. The sewage sludge/digestate is heated at 180°C-190°C at 9-14 bar for about one hour.
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	In order to monitor the electrical and methane consumed by Carborem technology, Carborem operators develop a software analytics tools which collected data of electricity and gas meters.

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU

	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	Sewage sludge / digestate from winery making and dairy industry and from civil sludge. The technology could be applied to all the wet organic wastes (with moisture content > 50 wt.%).
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market *(novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)*	As a result, higher % of dry matter content can be reached by using Carborem technology before a common dewatering system like centrifuge. The drop of the total suspended solid during the process and the higher dewaterability of hydrochar allows to reduce sludge by 50-70 wt.% compared to using the sole traditional dewatering system (centrifuge, filter press).

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	Carborem technology provides a method to reduce by more than 40% the total suspended solid of sludge/digestate during the HTC process, without the addition of chemicals and/or oxygen. In about one hour, sludge is converted into a sterilized slurry (Escherichia Coli<10 MPN/g;), which is then dewatered in a centrifuge to obtain a solid with high phosphorus and carbon densification and low PAHs content (PAHs reduction by 67-77% compared to the initial sludge).

Co-funded by
the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	CIMBERIO s.p.a
	website	https://smartcim.it/it/

Identification of the technology	*Name of the technology* *(technology can be a product, a process or a service)*	SmartCIM system
	Technology Area	Energy Technologies

Description of the Technology	*Context* *(specific problem(s) or opportunities the technology wishes to address)*	In HVAC plants heating and cooling are regulated by balance of heat/cool load served from the heat/cool terminals. In such conditions, it is possible to regulate the flow to the terminals, opening the valves, while reducing pump velocity, as none of the terminal requests a different power level.
	Main purpose of the technology *(how does the technology address the problems or opportunities?)*	SmartCIM value aims at transforming water distribution valves from simple actuators of the Heating Ventilating Air Conditioning (HVAC) distribution systems into smart active nodes that can control with great accuracy quantities flowing through and interoperate with other components of the system (coils, thermostat, pumps) in such a way as to deliver the exact amounts of heat/cooling in each zone served with minimal amount of water and losses. In a nutshell, smart valves shall enable smart, efficient HVAC plants.
	Principle used *(which are the scientific or technical references of the technology)*	The new valve technology is based on the deep integration of sensors and actuators; software eco-system makes the valve interoperable with other hydronic components, enables seamless implementation of advanced controls and allows monitoring from the internet.
	Which are the main claim(s) on the technology's performance that could be verified?	SmartCIM provides information, since each valve measures flow rate, temperature and heat flow passing through.
	Under which conditions is this performance(s) achieved? *(key operational parameters and limits in order for the technology to perform)*	The uncertainties of measurement shall not exceed the values specified on Standard BS EN 14511-3:2013: Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling.
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What*	

	are the main regulations relevant for the technology?)	

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	The valve becomes an active node of the distribution plant that enables smarter controls and demand management strategies.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market (novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)	SmartCIM is among the first valves with IoT (Internet of Things) features, including monitoring/user feedback on mobile devices (at present there are only few companies manufacturing valves which can be run by Internet).

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	Benefits in application are substantial in terms of electrical power savings by: 1) drastically reduce power for pumping; 2) cut parasitic losses due to membrane pre-load in PICVs.

Co-funded by
the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	Deref S.p.A.
	website	(https://www.deref.com/it/

Identification of the technology	*Name of the technology (technology can be a product, a process or a service)*	ReStoRe
	Technology Area	Materials, Waste and Resources

Description of the Technology	*Context (specific problem(s) or opportunities the technology wishes to address)*	The steel industry is the single largest consumer of lime in the world, with about 30-50 kg (up to 120 kg/t for stainless steel) for every ton of steel produced. Lime production generates large amounts of CO2 directly and indirectly. The emission of carbon dioxide from the lime sector is non-negligible, in fact about 1 ton of CO2 from direct (chemical reaction) and indirect (heating) is emitted into the atmosphere to produce 1 ton of CaO.
	Main purpose of the technology (how does the technology address the problems or opportunities?)	ReStoRe can directly decrease consumption of lime (and eventually other basic and aluminabased slag formers) in steel production and get a good amount of recovered metal.
	Principle used (which are the scientific or technical references of the technology)	Principle used are: • Sifting, where the fine particles are separated from the coarse ones; • Selection, where coarse particles are separated manually by metal, slag and aluminous materials; • Grinding, where coarse parts are reduced to 5-50 mm particles to have a suitable granulometry for the steel melting bath; and • Magnetic and, if necessary, a-magnetic separator, which recovers the fine metal particles. The refractories therefore, once processed, are reintroduced into the production cycle from which they derive, in substitution of virgin raw materials.
	Which are the main claim(s) on the technology's performance that could be verified?	Recycling, cost saving and reduction of CO_2 emission and energy consumption.
	Under which conditions is this performance(s) achieved? (key operational parameters and limits in order for the technology to perform)	Important conditions which influence the performance are: • The quality of waste refractory materials;

	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	• The quantity of waste refractory materials; • Respect of correct demolition procedure and A correct treatment of ladles (adequate cooling time to avoid a larger fine powder creation and rising due to the chemical-physical proprieties of the slag).

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	Over half of the world's refractory production is used by steel producers. These steel producers are both integrated mills (including a Basic Oxygen Furnace - BOF) and mini mills (typically with an Electric Arc Furnace - EAF). Generally, spent refractories do not have much value after service, creating disposal issues. In the past, spent refractory was considered a waste and only few plants used to recycle it.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market *(novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)*	Since more than half of the weight used in the steel production process ends up in gaseous emissions, solid waste or other by-products, DEREF considers that reducing this kind of environmental impact while trying also to reduce money waste by circular economy solutions is a crucial contribution both to environment and to economy. Processing waste material directly inside the steel plant, DEREF is able to manage waste materials directly from origin to control application of secondary raw materials and get a very high recycling rate; moreover, DEREF yields output directly to the steelmakers, this enables to save useless transport bills and CO2 emissions.

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	ReStoRe treatment enables to recycle refractory waste as Secondary Raw Materials (SRM) in the steel process and/or in other industrial processes. Global environmental impact of the treatment depends on the use of the produced secondary raw material in particular on the characteristics of the Virgin Raw Materials (VRM) they substitute.

Co-funded by
the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	HBI S.R.L.
	website	https://www.hbigroup.it/

Identification of the technology	*Name of the technology* *(technology can be a product, a process or a service)*	Eva mini
	Technology Area	Water Treatment and Monitoring

Description of the Technology	*Context* *(specific problem(s) or opportunities the technology wishes to address)*	Sewage sludge from wastewater treatments plants is typically sent to landfills or incinerated. These options have environmental drawbacks and new solutions must be pursued in the future to increase the sustainability of wastewater treatment plants.
	Main purpose of the technology *(how does the technology address the problems or opportunities?)*	Eva mini aims at: • Reducing by at least 80% the final material for disposal; • Eliminating the gaseous atmospheric emissions and consequent odors from the hydrothermal treatment (HTC); • Recovering water initially trapped within the sludge; and • Allowing to adjust the process conditions (residence time between 0.5 to 5 hours, temperature between 180 to 250 °C) according to the characteristics of the sludge, in order to guarantee predetermined performances.
	Principle used *(which are the scientific or technical references of the technology)*	Eva mini is an innovative system in which two processes are synergically combined to treat sewage sludge, namely: 1. Hydrothermal carbonization (HTC); and 2. Gasification processes
	Which are the main claim(s) on the technology's performance that could be verified?	- Drastic reduction of the waste while guaranteeing zero emissions from HTC. - Production of syngas with high heating value. - Recovery of byproducts with densified content of valuable materials.
	Under which conditions is this performance(s) achieved? *(key operational parameters and limits in order for the technology to perform)*	1) Sludge input at least 350 kg/d at about 75% moisture. 2) Sludge hydration at solid/liquid ratio 11%. 3) HTC at 25 bar(g) in the range 180-230 °C and 2-2.5 hours 4) Solid-liquid separation through evaporation at 140 °C and 0.1 bar(a), and subsequent vapor re-condensation, obtaining the "process water" stream.

		5) Continuous hydrochar gasification in fixed- bed updraft gasifier at 700-900 °C Syngas burning.
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	Thanks to the valorisation of the syngas produced in the gasifier, if compared to the traditional sewage sludge disposal methods, a scale up of Eva mini is able to reduce the disposal cost up to 74%; compared to the technologies currently available in the market for wet waste and sewage sludge treatment, HBI technology has the best performance in terms of Return of Investment. These results can be obtained with a plant with 10000 ton/year processing capacity of sewage sludge at 75% moisture and 7920 h/year yearly working hours.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market *(novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)*	

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	Thanks to its operational flexibility (HTC temperature from 160 to 230 °C, residence time from 0.5 to 6 hours), Eva mini can adapt the HTC parameters to the mass rate and quality of the input stream. Integrated in a wastewater treatment plant, Eva mini allows to recirculate back the liquid output, therefore with no need for a dedicated treatment unit. The gasifier can be operated in a flexible way modulating from 0 to 100% the input of air and oxygen. The emission of HTC gas is avoided by diverting it into the gasifier, what makes the HTC operation odor-free.

		5) Continuous hydrochar gasification in fixed- bed updraft gasifier at 700-900 °C Syngas burning.
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	Thanks to the valorisation of the syngas produced in the gasifier, if compared to the traditional sewage sludge disposal methods, a scale up of Eva mini is able to reduce the disposal cost up to 74%; compared to the technologies currently available in the market for wet waste and sewage sludge treatment, HBI technology has the best performance in terms of Return of Investment. These results can be obtained with a plant with 10000 ton/year processing capacity of sewage sludge at 75% moisture and 7920 h/year yearly working hours.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market *(novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)*	

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	Thanks to its operational flexibility (HTC temperature from 160 to 230 °C, residence time from 0.5 to 6 hours), Eva mini can adapt the HTC parameters to the mass rate and quality of the input stream. Integrated in a wastewater treatment plant, Eva mini allows to recirculate back the liquid output, therefore with no need for a dedicated treatment unit. The gasifier can be operated in a flexible way modulating from 0 to 100% the input of air and oxygen. The emission of HTC gas is avoided by diverting it into the gasifier, what makes the HTC operation odor-free.

Co-funded by the European Union

Erasmus+ KA210-VET - Small-scale partnerships in vocational education and training
Project number **2024-2-PL01-KA210-VET-000295845**

EU Environmental Technology Verification

Quick-Scan

SME	*Legal name*	Pozzoli Depurazione srl
	website	https://www.pozzoliambiente.com/

Identification of the technology	*Name of the technology* *(technology can be a product, a process or a service)*	VRT – Vacuum Rain Tank
	Technology Area	Water Treatment and Monitoring

Description of the Technology	*Context* *(specific problem(s) or opportunities the technology wishes to address)*	A risk analysis applied to the fuel load process during rainfalls allowed to underline that rainwater can infiltrate within the manholes.
	Main purpose of the technology *(how does the technology address the problems or opportunities?)*	VRT system ensures the absence of rainwater and/or groundwater within interspaces, confined areas and in particular within manholes of underground tanks of fuel stations.
	Principle used *(which are the scientific or technical references of the technology)*	VRT system provides the suction and the following depuration of rainwater in the manholes of fuel storage tanks and in other closed areas characterized by the presence of water polluted by hydrocarbons. It has been designed and implemented in order to ensure a continuous path from the sampling point up to the discharge.
	Which are the main claim(s) on the technology's performance that could be verified?	The purpose of this system is to avoid the contamination of terrains and groundwater through collection of contaminated rainwater, treating in oil separator and subsequent conveyance of treated waste water to the existing sewerage system.
	Under which conditions is this performance(s) achieved? *(key operational parameters and limits in order for the technology to perform)*	VRT is suitable for the treatment of water with a percentage of hydrocarbons within the mixture up to 5 %. In case of higher percentage (e.g. in case of incidental fuel spreading) the removal must occur through cleaning truck services.
	Main technical standards, regulations or references applicable to the technology *(Are there existing standards that cover (parts of) the technology? What are the main regulations relevant for the technology?)*	The" VRT – Vacuum Rain Tank" has not been tested previously. Therefore, the verification is based on new data since no existing data were available.

Market readiness	*Is the technology already on the market?*	YES
	What is the target market for the technology?	Italy, EU
	Does the technology fulfil the legal requirements in the targeted market(s)?	YES
	The PMI is the sole and full owner of the technology?	YES
	What specific user needs is the technology addressing? How does this technology meet the user needs?	VRT system provides the suction and the following depuration of rainwater in the manholes of fuel storage tanks installed by fuel stations, transport areas, private commercial activities.
	Description of the innovation provided by the technology, in comparison with relevant alternatives on the market *(novelty presented by the technology in terms of design, raw materials involved, energy used, production process, use, recyclability or final disposal)*	The principle used by VRT System is Vacuum suction and physical water treatment with oil separators.

Environmental added-value	*Is there information concerning environmental aspects for these stages?*	YES
	Are there available test results or other data to back-up the technology's performance?	YES
	In terms of environmental impacts or environmental added value, are there significant differences in these stages between the technology and relevant alternatives?	The VRT is system, in the correct condition of operation and use, and in the field conditions is able to ensure "total hydrocarbons" and "total suspended solids" concentration downstream of the VRT System in full compliance with regulations.

References

Beer, Michael & Noria Nitin (2000). Cracking the Code of Change. Harvard Business Review. www.hbr.org/2000/05/cracking-the-code-of-change

Heath, Dan & Heath, Chip (2011). Switch: How to Change Things When Change Is Hard. A practical guide on making successful changes in personal and professional contexts. Random House Business.

Kotter, John P. (2012). Leading Change. Harvard Business Review Press.

Kotter, John P. & Cahen, Dan S. (2012). The Heart of Change: Real-Life Stories of How People Change Their Organizations. Random House Business.

Kotter, John P. (1995). Why Transformation Efforts Fail" by John P. Kotter. Harvard Business Review. www.hbr.org/1995/05/leading-change-why-transformation-efforts-fail-2

European Commission – Joint Research Centre (JRC). (2016). Clarification on the meaning of 'verification' under ETV and its distinction from certification. https://op.europa.eu/en/publication-detail/-/publication/9070f741-9cf1-4893-a2ea-df5b678016de

European Commission – Directorate-General for Environment. (2016). Environmental Technology Verification (ETV) Pilot Programme https://op.europa.eu/webpub/com/refit-scoreboard/en/policy/7/7-22.html

European Commission – Directorate-General for Environment. (2016). EU Environmental Technology Verification (ETV) https://prod5.assets-cdn.io/event/6811/assets/8366666717-d838c8e5f8.pdf

European Commission – Directorate-General for Environment. (2016). Environmental Technology Verification pilot programme https://breeam.com/documents/d/bre-group/eu-etv-general-verification-protocol-1-3/

DHI Group. (2016). Environmental Technology Verification (ETV) https://www.dhigroup.com/upload/publications/misc/Industry_SolutionFlyer__ETV%20-%20DHI%20Solution.pdf

KWR Water Research Institute. (2016). EU Environmental Technology Verification (ETV) https://www.kwrwater.nl/en/samenwerkingen/eu-environmental-technology-verification-etv/

ETV4 SMEs

Co-funded by the European Union