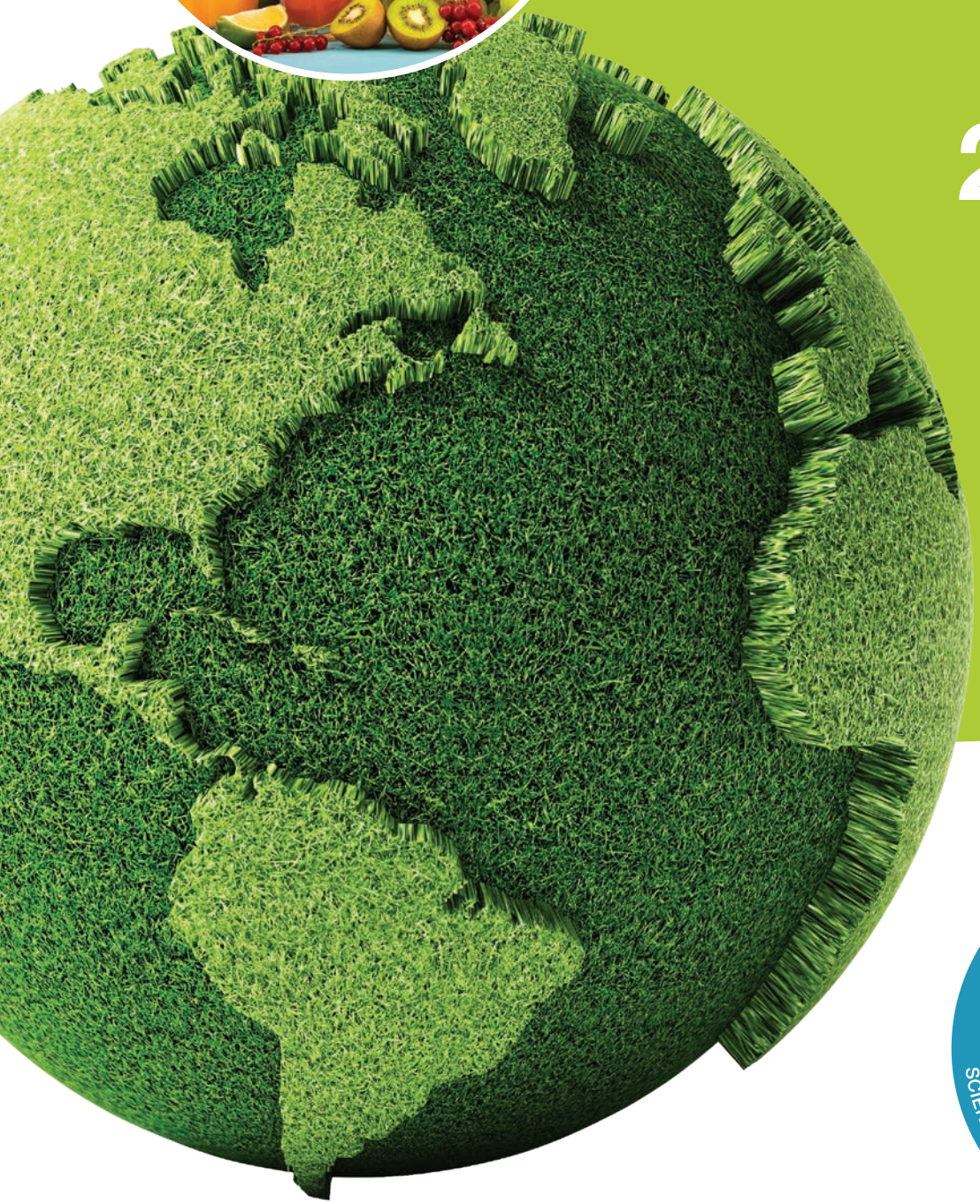
Global Juice Sustainability Report

2025



Sharing Knowledge Globally
International Fruit and Vegetable Juice Association
IFU
SCIENCE • STANDARDS • MARKETS • SUSTAINABILITY

CONTENTS

Foreword from the President

Kees Cools, IFU President

More than ever sustainability initiatives are needed as costs and risks are increasing globally and higher food prices are affecting consumers all over the world. Unfortunately, while problems are growing, we see companies and governments scaling back their sustainability ambitions and efforts. The cost of doing less may become visible through food and beverage inflation that impacts not only consumption but can also create monetary and political unrest.

The 2025 IFU Sustainability Report is more than a collection of articles — it is a testament to the shared commitment, ingenuity, and resilience of our global juice community. From the orchards of Argentina to the processing plants of Austria, from the regenerative passionfruit farms of Peru and Vietnam to the innovative packaging solutions emerging in Australia, this year's report captures the breadth and depth of our global industry's sustainability journey.

Our contributors — IFU members, industry leaders, innovators, and advocates — have brought forward stories that reflect the urgency of our times and the opportunities that lie ahead. They address the pressing challenges of climate change, biodiversity loss, water scarcity, and social equity, while showcasing practical solutions that are already making a difference.

In **Africa**, we hear from Slim Othmani on the importance of clean water access and from Patricia Obichukwu on advancing decent work and economic growth.

In **the Americas**, Paula Dip explores the transition from risk to resilience in biodiversity management, while Noelia Lescano examines new land use requirements shaping agricultural practices. From Brazil, Ana Carolina Carvalho presents a breakthrough in water treatment for the juice industry, and LDC shares its roadmap for decarbonizing the juice value chain. Harry Frei's contributions from Ecuador, Peru, and Vietnam highlight how passionfruit production can be both regenerative and circular, delivering benefits for communities and ecosystems alike.

In **Europe**, we see how Austria Juice is applying Product Environmental Footprint (PEF) methodology to measure and reduce impacts and how GrandHoc in Spain is rethinking refrigeration to cut emissions and energy use.

Across **Australia**, AusBev navigates the shifting regulatory landscape for packaging, aligning with SDGs 9, 12, 13, and 17.

Our **Other Initiatives** section celebrates collaborative platforms and traditional knowledge — from clay pot irrigation in Chile to the Sustainable Juice Platform's sector-wide efforts, and from global market insights by Euromonitor to the Farm Sustainability Assessment's practical tools for growers.

Finally, Aintzane Esturo closes the report with a call to action, reminding us that driving sustainability in the juice industry is not the work of a single company or region, but the result of collective vision, shared responsibility,cooperation and continuous innovation.

This report is a mirror of our industry's progress and a compass for where we must go next. It is my hope that it inspires you — whether you are a grower, processor, retailer, policymaker, or consumer — to join us in shaping a juice sector that nourishes both people and planet.

Together, we can turn sustainability from aspiration into action.

IFU SWG Chair's Foreword

Shannon Doherty-Andall,
IFU Sustainability Working Group Chair

I'd like to start with a profound thank you to David Berryman for his time, leadership, and guidance as this working group has navigated a rapidly changing landscape on a variety of sustainability related fronts. I will undoubtedly miss David's ability to look realistically at challenging situations, while somehow remaining unwaveringly optimistic. Cheers to new adventures!

In looking back through my time in this group since its launch in 2021, our work truly reflects many emerging topics that have quickly become international priorities as the world races to mitigate climate change and preserve biodiversity. Many within our industry engage in sustainable practises as an innate part of good business operations and as a part of maintaining social licence to operate. Amplifying and enabling adaptable solutions between businesses and regions provides great value, and it is my hope that the publications and resources this group has worked on until this point and in the future provide as much value to you, as they have for me.

Interestingly, what is quickly happening throughout the world and being reflected in the working group is the "institutionalisation" of sustainability action, seen though the development of the UN Plastics Treaty, the IFRS Disclosure of Sustainability-related Financial Information, the increase in green finance, the adoption of net zero targets, and more. It's encouraging to know that we are all participants in a rapid adoption phase where we must measure, manage, and mitigate our environmental impact with increasing regulatory oversight.

Adding yet another layer to the global landscape, the ongoing discussions facilitated through the UN Plastics Treaty negotiation has highlighted that the resources and capacity to implement sustainable change varies by country and supply chain. We've also been exposed to how our own activities affect stages of the supply chain differently, particularly in the developing world. While it's not always easy to plainly see the affect our products have on our end-to-end value chains, packaging is a key example where those realities are going to begin to influence our local markets' regulations, available products and machinery design.

It is my hope that as Chair, the working group can continue to provide maximum value to the greater industry as we navigate these headwinds of change, utilising the strength of our collective knowledge and experience to ensure the fruit and vegetable juice industries remain resilient long into the future. I look forward to working with everyone to achieve this goal.

Sustainability Challenges and Opportunities in Africa's Beverage Sector

Slim Othmani, IFU Ambassador Africa

Africa stands today at a decisive crossroad in its journey towards achieving the Sustainable Development Goals (SDGs). The continent faces undeniable challenges: climate change is intensifying droughts and floods, packaging waste management remains embryonic, financing gaps are substantial, and regulatory frameworks often lack clarity. Yet, Africa is also a space of resilience and innovation, where governments, businesses, and communities increasingly understand that sustainability is not an option but a condition for future growth.

In North Africa, beverage producers have taken a pioneering step by initiating voluntary Extended Producer Responsibility (EPR) schemes to tackle post-consumption packaging waste. Under the aegis of national associations, such as APAB in Algeria, companies are pooling resources to create eco-organizations that collaborate with ministries, international donors, and audit firms. These initiatives, though fragile, embody the principle that industry-led responsibility can precede regulation and gradually shape consumer habits and recycling ecosystems.

Further south, countries like Nigeria illustrate both the scale of opportunity and the weight of structural barriers. The formation of the National Citrus Growers, Processors and Marketers' Association (NCIGPMAN) has mobilized more than 500,000 actors across 20 states. Their agenda — supporting sustainable farming, empowering women and youth, and linking local production to global markets — shows how sectoral organization can become a vehicle for inclusive growth. However, poor infrastructure, limited access to finance, and lack of research capacity still hinder the pace of transformation.

The financing gap remains the elephant in the room. According to the UN Economic Commission for Africa, the continent will need over 400 billion USD by 2030 to align with ESG and SDG requirements. Bridging this gap requires the active involvement of governments, local banks, global institutions, and private investors. Partnerships with the World Bank, the African Development Bank, or the EBRD are not only desirable but necessary to scale existing initiatives into continental solutions.

Electrification, AI and Data Infrastructure. One of Africa's most pressing sustainability challenges is the electrification of industries and rural communities. Energy shortages not only restrict economic growth but also undermine progress in areas such as cold chains, water treatment, and packaging recycling. Here, artificial intelligence offers a lever for progress: AI-powered systems can optimize energy distribution in fragile grids, reduce losses, forecast demand more accurately, and integrate renewable sources like solar and wind at scale. Yet AI itself requires robust infrastructure. The establishment of regional data centres is no longer a luxury but a necessity — both to host AI-driven applications locally and to support industrial digitalization. Without these facilities, Africa risks remaining a consumer of imported technologies rather than a producer of added value. Sustainable, energy-efficient data centres, powered by renewables, could become the backbone of a new industrial era for the continent, enabling local innovation while anchoring global competitiveness.

Despite these obstacles, Africa's sustainability landscape is dynamic. From voluntary recycling platforms in the Maghreb to farmer-driven associations in West Africa, to renewable energy integration in Southern Africa, the direction is clear: sustainability is emerging as a shared responsibility across societies. What remains is to accelerate coordination, mobilize financing, and amplify success stories — so that the continent not only meets its sustainability targets, but redefines them in a way that reflects Africa's demographic dynamism and unique ecological wealth.

Opportunities and the Role of IFU in unlocking Sustainable Market for West African Juice Production

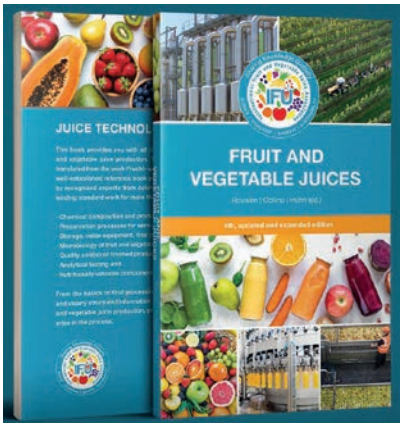
Patricia Obichukwu, CEO Best Produce International (UK) Ltd and IFU representative in Nigeria and other West African countries

Synopsis:
West Africa has great potential in fruit juice production due to its tropical climate, rich biodiversity, and abundance of fruits like mangoes, pineapples, oranges, guavas, baobab, coconuts, pawpaw, banana and lemon. However, to actualise this potential sustainably, it will require collective efforts to over-come market access barriers, infrastructure gaps, and quality assurance challenges. Despite this great potential and enormous market opportunities that the juice production sector in West Africa could have offered in addressing some of the UN Development Goals such as; No Poverty, Good Health and Well-being, Decent Work and Economic Growth, etc. Nevertheless, this great potential remains unactualized due to challenges such as pre- and post-harvest losses, inconsistent quality and international food safety standards, low mechanisation, limited smart farming and processing solution capacity, climate change impact, lack of adequate infrastructure and poor linkages with International Market Networks on juice production.

To tackle the underutilization of the significant opportunities and challenges in juice production across West Africa, it is essential for countries in the region that aspire to become global leaders in the industry to strategically align with international platforms such as the International Fruit Juice Association (IFU). Such collaboration can provide a transformative, game-changing experience that strengthens their competitiveness and positions them more effectively in the global juice market. Therefore, for West African stakeholders, IFU will offer unique value in accelerating sustainable development through strategic alignment, capacity Building and Knowledge Transfer, Market Intelligence, Global Networking, Advocacy and Representation, and Promotion of Sustainable Standards.

Access to Global Standards and Best Practices:
IFU provides scientific information on method of analysis, Legislation and technical guidance on fruit and vegetable juice production, food safety, hygiene, nutrition, sustainability, and labelling standards, water usage, and technology. This knowledge and expertise will empower West African stakeholders to align with global standards and best practices.

Capacity Building and Training
One of IFU's key objectives is to bring valuable knowledge transfer and industry expertise to the juice production communities through its University collaborative programme, Global Academy, workshops, webinars, conferences and expert forums on juice processing innovations, quality assurance, and market trends. Therefore, with a coordinated approach and effective collaboration, West African producers / exporters and policy makers will enormously benefit from upskilling their workforce and modernizing their operations.



Market Intelligence and Networking
As a global body of industry professionals, IFU offers members, (producers and policymakers) a great access to global market data, consumer trends, and connections with multinational buyers, equipment suppliers, and investors. This will obviously be West African stakeholders industrial connectivity and technological

knowledge transfer that would be required for effective growth.

Advocacy and Representation

The IFU represents the global juice industry at key international organizations and standard-setting bodies. Acting as the collective voice of juice producers, IFU actively participates in the work of the Codex Alimentarius Commission, the Food and Agriculture Organization (FAO), the World Health Organization (WHO), the World Trade Organization (WTO), the International Organization for Standardization (ISO), and many other international institutions. Through this engagement, IFU ensures that the interests of juice manufacturers are considered in the development of food safety standards, regulatory frameworks, and technical guidelines, helping to promote fair trade, product quality, and consumer protection worldwide. IFU advocates for the juice sector globally and ensures small and emerging markets like West Africa have a voice in international dialogues on food safety, climate impact, legislation, standards and fair-trade policies. Consequently, with the current trend of widening gap for developing countries in meeting the market standards, IFU, will play a significant role in ensuring that the voice of the West African juice community is heard in the global arena.

Promotion of Sustainable Standards and Public Private Partnership

There is a need in West Africa in reducing environmental footprints, encouraging renewable energy use, water efficiency, and responsible sourcing and promotion of public private partnership between industry professionals and local stakeholders. This will strengthen producers' / exporters' ability to meet international standards including ESG (Environmental, Social, Governance) requirements of export markets and effectively compete at the international market. IFU supports the West African members through the focus on sustainable juice production.

Effective Engagement for Sustainable Future

IFU as a global voice for small and developing juice production countries, leverages its international industry network and professional expertise to empower West African Juice stakeholders in achieving sustainable future. This engagement will contribute towards UN Developmental Goals such as: (1) No Poverty, (3) Good Health and Well-being, (4) Quality Education, (5) Gender Equality, (8) Decent Work and Economic Growth, (9) Industry, Innovation and Infrastructure, (12) Responsible Production and Consumption, etc.

Conclusion

Sustainable market access for West African juice sector is within reach, with the strategic alignment and support of IFU. By adopting regional and international standards and engaging with global industry bodies, the West African region can move beyond its current limitations of low production standards and minimal exports to emerge as a competitive supplier of high-quality, and branded juice products for the international market. This will create jobs, reduce food waste, empower farmers, and position West Africa as a key player in the global juice economy.

The transition from risk to resilience: biodiversity, uncertainty, and emerging opportunities

Paula Dip, Head of Sustainability Vicente Trapani S.A.

In an increasingly complex global scenario, business resilience requires a comprehensive approach that includes the analysis of physical and financial risks arising from climate change and biodiversity loss. We understand that climate sustainability requires a combination of integrated and simultaneous mitigation and decarbonization actions, as well as the ability to adapt to manage the risks and opportunities of climate change.

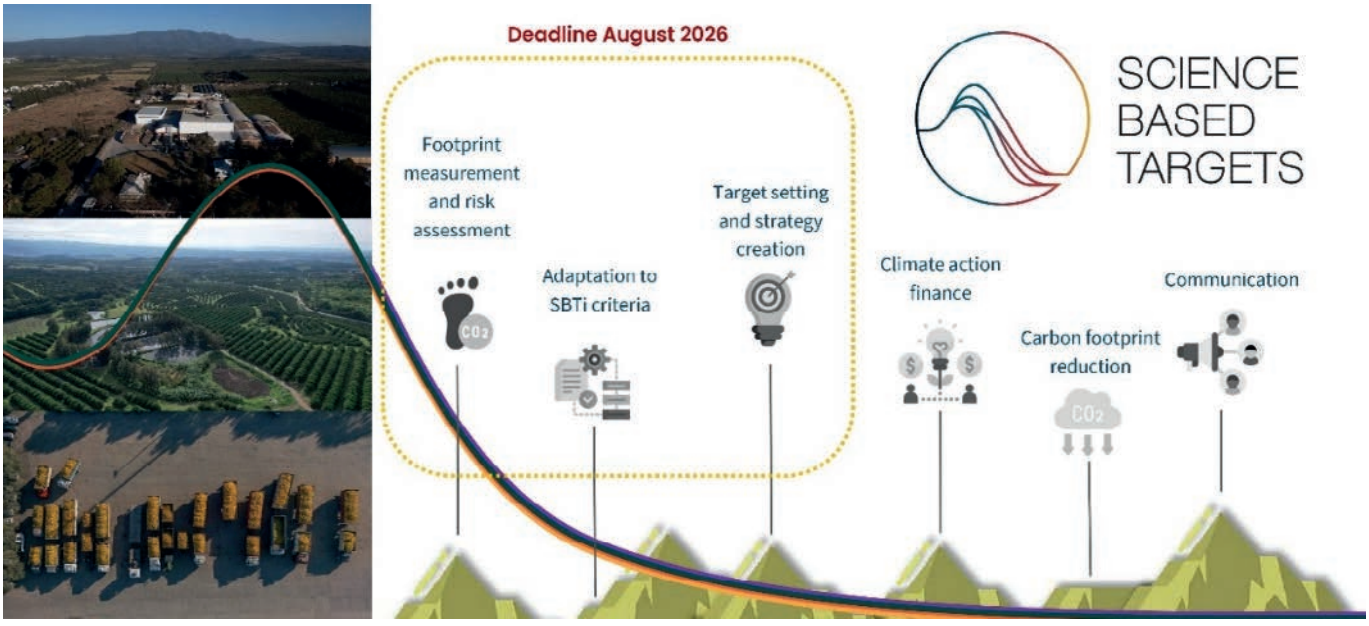
Knowledge, measurement, action: towards evidence-based management.

The latest Global Risks Report from the World Economic Forum ranks biodiversity loss and ecosystem collapse among the most severe risks over the next 10 years. These risks, often perceived as distant or unrelated to business, can have profound consequences for agricultural production, climate stability, and business financial security. In this context, managing them is not only an environmental responsibility, but also a smart continuity strategy.

Business resilience is built from a systemic perspective that integrates the complexity of the natural environment and the global risks that affect it. Our strategy is based on three pillars: **knowledge of the territory, rigorous measurement, and preventive action.**

1. DOUBLE MATERIALITY Impacts and risks in the same strategic equation

In 2024, we took a key step forward by conducting our first **double materiality analysis,** which allowed us to integrate the impacts we generate on the environment



with the environmental and social risks that could affect our operations and financial projections. This tool challenged us to broaden our perspective and strengthen our management, prioritizing issues that are not only relevant to our stakeholders, but also to the continuity and adaptability of the business.

2. Science Based Targets initiative – A transparent and realistic path to climate security

One of the main advances was the **consolidation of our carbon strategy.** In 2024, we aligned our strategic objectives with the Paris Agreement's global initiative to combat climate change by joining the Science Based Targets initiative (SBTi). An ambitious and challenging path lies ahead with a clear goal: to define a validated strategy through 2026 and achieve a 40% reduction in our emissions by 2030.

3. BIODIVERSITY – Caring for ecosystems is caring for business

Biodiversity is a strategic pillar for Vicente Trapani because it silently but vitally sustains the ecosystem services that make our production possible: soil quality, water availability, pollination, and climate regulation. Our land management actively integrates this approach, combining conservation actions with scientific monitoring of fauna and vegetation.

During 2024, we made progress on a new forest inventory, in situ measurements of our plantations, and biodiversity monitoring. ***What did we find?***

3.1. Total carbon stock of forests and citrus plantations

We completed our forest inventories of native forests and moved forward with the installation of permanent plots to measure their carbon sequestration capacity in the medium term.

Environment Area	Carbon per hectare	Area	Conversion factor to CO_2	Total stock
Citrus fruits	34.00	1,300.00	3.67	162,081.40
Yungas forest	60.94	264.00	3.67	58,995.28
Chaco Serrano Forest	19.80	7,814.00	3.67	567,347.97

Vicente Trapani currently stores 788,424.66 tons of CO_2 equivalent

3.2. Carbon fixation in citrus fruits during 2024

We completed the measurement of the entire age range of our plantations: 1,270 plants measured in 82 plots (1 to 35 years old)

Annual carbon accumulation rate measured: 6,445 tons of CO_2 equivalent.

*With these measurements, we reinforce the **transparency** of our actions and manage to offset approximately **20% of our total annual emissions generated in 2024** through natural carbon capture in citrus fruits, demonstrating the potential of the production system to actively contribute to climate action.*

3.3. Mammal monitoring

Our biodiversity management program establishes monitoring every two years. Their presence—or absence—provides valuable information to guide preventive conservation and restoration actions.

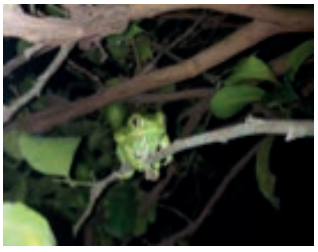
- Greater species diversity, with the presence of key carnivores and herbivores such as the collared peccary and the corzuela. The tapeti, puma, and collared peccary remain relevant for conservation and monitoring
- Three species not detected in 2022 were added: the mayuato and the yaguarundí.

3.4. Amphibian monitoring

These bioindicators are key to assessing ecosystem balance: amphibians, which are highly sensitive to changes in soil and water, alert us to early environmental disturbances.

Representative diversity: Twelve species of anurans were recorded, representing 57% of the specific amphibian richness of the lower Yungas region in Tucumán.

Building resilience means looking beyond the short term. It means understanding that protecting biodiversity today guarantees water security, pollination, biological control, and productive stability tomorrow. It also means preparing to respond—and anticipate—a world that demands transparency, traceability, and verifiable commitments.



VICENTE TRAPANI | 60 años 1965 2025

We lead with purpose, we grow with conscience.

A Transformative Vision

Noelia Lescano, Quality and Sustainability Management Head. Citrusvil

For some time now, we have been modernizing our production methods, thus contributing to a low-carbon economy, which, in turn, involves transforming our business by combining innovation, accountability, and a long-term perspective. We are moving toward decarbonization with science-based targets.

Climate change challenges us to rethink the present and anticipate the future. Our value chain depends on natural resources, and caring for them also means caring for the continuity of our production, the well-being of the communities and the biodiversity of the ecosystems where we operate.

At Citrusvil, we are moving forward with our Climate Transition Plan, which focuses on decarbonization. That is why we are setting our greenhouse gas emission reduction targets for 2035, in accordance with the Green Deal, as part of our journey toward reaching net zero by 2050.

A Journey That Began by Measuring

"In 2024, we optimized the methods to quantify our greenhouse gas emissions in accordance with the GHG Protocol standards. What we obtained was more than an inventory: we got a clear map to identify where to act, prioritize actions, and design strategies that generate measurable and transparent results," said Agustina Lucci, Sustainability Manager at Citrusvil.

On this journey of improvement, we adhere to the Science Based Targets initiative (SBTi), which means that our next targets will undergo an independent validation process.

Our goals will be based on the latest climate science, the Green Deal, and the Paris Agreement, and will be developed under the guidelines of the Science Based Targets initiative (SBTi). Each step will be validated using scientific criteria and measured transparently, ensuring a real impact on limiting global warming to 1.5 °C.

Our **Decarbonization** Journey

CITRUSVIL
LEMON GROWING & PROCESSING

2008
Biogas generation from lemon effluents. Citrusvil achieves a circular economy model, ZERO EFFLUENT.

2011
Biogas incorporation in boilers, reducing fossil gas consumption by 20% on average.

2015
Construction of the third biodigester → Increase in biogas production.

2019
- First purchase of renewable wind energy.
- First comprehensive carbon footprint measurement.

2023
High-efficiency boiler incorporation → Reduction in natural gas consumption.

2024
New biodigester, second efficient boiler, and carbon footprint optimization under the GHG Protocol.

2025
Committed to the SBTi and new wind energy contract for our orchards.

Concrete actions that leave a mark:

- Pioneers in biogas: since 2009, we have been transforming our effluents into renewable energy, thus consolidating a circular economy model.
- Energy efficiency: in the last decade, we have reduced our use of natural gas by 20% by replacing it with biogas.
- Growing renewable electricity matrix: today, 65% of our consumption comes from clean sources, and our goal is to reach 90% in the short term.

Production and Future

Our journey to net zero emissions is also an invitation to build a future together where production and caring for the planet go hand in hand.

At Citrusvil, we understand that sustainability is the way to move forward.

Left: High-efficiency boiler: key to reducing energy consumption and emissions.

Top Left: Biodigesters at the renewable energy plant: transforming effluents into clean energy.

Multioxidative System for Water Treatment

A Case Study Applied for Juice Industry

Ana Carolina da Costa Carvalho, Vice-President and
Jessica Kunsminskas da Silva, R&D Coordinator, Contech Brasil

The multioxidative system can provide better management of chemical consumption and reduce the generation of solid waste. With the imminent scarcity of water and the consequent rise in the costs of its collection and disposal, the possibility of reusing wastewater offers not only an environmental advantage but also greater efficiency for industries. Currently, one of the greatest challenges lies in treating effluents and water with high levels of organic contamination. Conventional methods often fail to degrade organic matter efficiently and are associated with high costs and complex operations, such as the generation of sludge and its subsequent disposal in landfills [1].

In this regard, Advanced Oxidative Processes (AOPs) have gained attention due to their high efficiency in degrading a wide range of organic compounds, and they have proven to be a viable alternative for the treatment of surface water, groundwater, contaminated soil, and industrial effluents [2]. The core concept involves generating hydroxyl radicals (•OH)—highly reactive oxidizing species—in sufficient quantities to achieve the mineralization of organic matter [2].

Figure 1 – The Multioxidative System manufactured by Contech in partnership with Ecosign

In this context, Contech Produtos Biodegradaveis, in partnership with Ecosign Technologies, has developed a process system that not only utilizes AOP but enhances it by combining efficient oxidizing species with a distinctive engineering design. The Multioxidative System (Figure 1) enables optimized generation of hydroxyl radicals to effectively reduce the levels of persistent organic contaminants, allowing for the classification of effluents for safe disposal or even reuse in various industrial operations.

TREATMENT OF WASTEWATER FROM A JUICE PRODUCER

Studies were conducted to treat industrial wastewater from a juice production plant located in São Paulo State, Brazil, using the Multioxidative System technology, with a primary focus on removing organic pollutants. Currently, the industrial wastewater undergoes pre-flotation and dissolved air flotation processes, followed by biological treatment in two aeration lagoons.

The treatability assessment begins with a detailed laboratory analysis to determine the characteristics of the effluent, which helps in selecting the most effective treatment method. Once the optimal treatment condition is identified, pilot-scale tests are carried out to confirm the treatment's effectiveness according to the proposed goals. The optimized process achieved reductions of up to 49% in COD, 79% in turbidity, 86% in TSS, and 25% in TDS. Table 1 presents the analytical results for samples collected before and after treatment, under optimized conditions.

Table 1. Characterization of the samples from pre- and post-optimized treatments

Sample	pH	Turbidity (NTU)	COD (mg/L)	Conductivity (uS/cm_{-1})	Hardness ($mgCaCO_3/L$)	TSS (ppm)	TDS (ppm)
Pre-treatment	6,8	437	1,300.00	2240	333	1266	968
Multioxidative System	7,1	90	264.00	2100	299	179	722

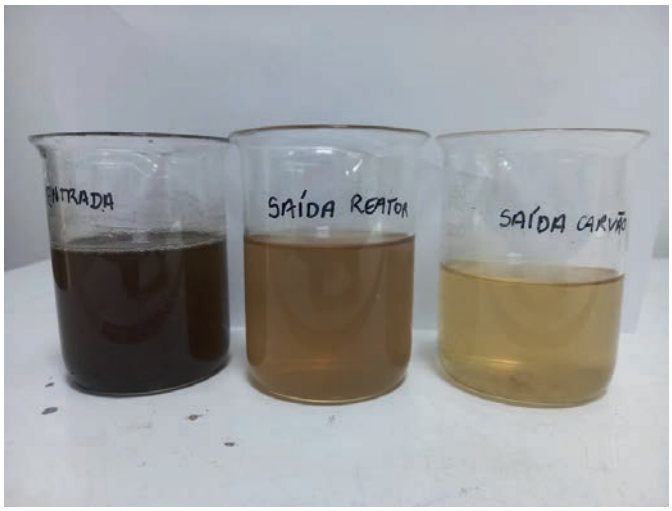


Figure 2. Visual appearance of the samples before treatment (left) and after Multioxidative treatment (right)

It is worth mentioning that the treatment produced water with properties that could allow the deactivation of one of the aeration lagoons at the wastewater treatment plant. Figure 2 visually represents the quality of the water obtained through the applied solution.

The implementation of the Multioxidative System represents a sustainable approach to significantly enhancing industrial water management. Advanced oxidation processes have proven essential for the degradation of persistent organic compounds, thereby reducing pollutant loads and supporting environmental compliance. This solution not only improves the quality of water for disposal but also makes it suitable for reuse within the production process—an important practice that contributes to water conservation and reduces the environmental impact of industrial operations.

REFERENCES

1. LINDHOLM-LEHTO, P. C.; KNUUTINEN, J. S.; AHKOLA, H. S. J.; HERVE, S. H. Refractory organic pollutants and toxicity in pulp and paper mill wastewaters. Environmental Science And Pollution Research, v. 22, n. 9, p.6473-6499, 4 fev. 2015.

2. GLAZE, W. H.; KANG, J.; CHAPIN, D. H.. The Chemistry of Water Treatment Processes Involving Ozone, Hydrogen Peroxide and Ultraviolet Radiation. Ozone: Science & Engineering, [s.l.], v. 9, n. 4, p.335-352, set. 1987. Informa UK Limited.

ecosign FUTURE SUSTAINABLE COMMITMENT

contech SMART CHEMISTRY

6 CLEAN WATER AND SANITATION

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

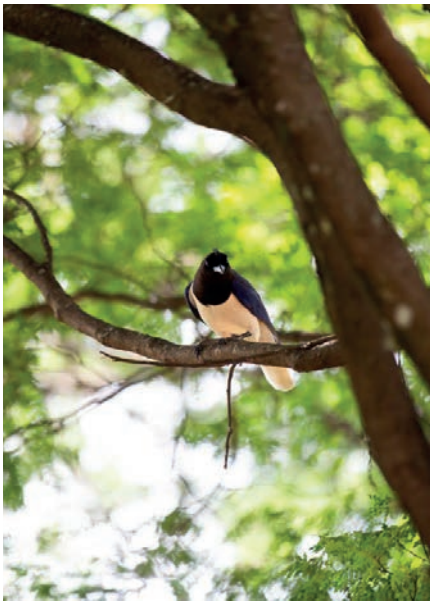
From Grove to Glass: Juice Value Chain Decarbonization and Innovation at LDC

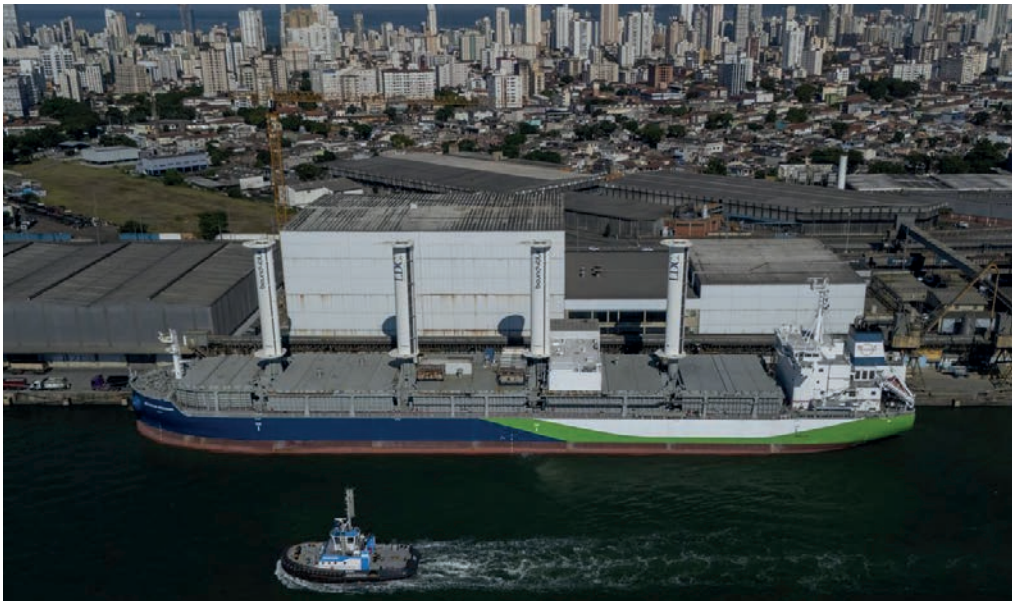
Gustavo Melchiori, Global Sustainability – Juie & Citrus Ingredients.
Louis Dreyfus Company Juices Holding BV

Nearly a decade after the Paris Agreement, setting the scene to limit global warming well below 2°C, businesses need to play their part in making this happen. As a leading merchant and processor of agricultural goods, Louis Dreyfus Company (LDC) has been active in the juice business for over 35 years, operating today in over 70 countries. With a fully integrated value chain, comprising ~30,000 hectares of LDC-managed citrus farms, three state-of-the-art processing facilities in Brazil and two distribution terminals in Brazil and Belgium, LDC recognizes its responsibility to reduce emissions from both its own operations and across its value chain. We do this by investing in innovative solutions across our juice and citrus ingredients journey.

It all starts at juice farms managed by LDC, where we continually apply sustainable farming practices such as use of drip irrigation, biologic inputs, ecological brush cutters and cover cropping between planted citrus rows, with a goal to increase productivity, water efficiency, soil health and the presence of organic carbon in the soil. Use of Internet of Things technology for real-time monitoring of agricultural machinery also helps us to optimize tractor routes and monitor and reduce machinery speed and idle time spent with engines running, resulting in ~6% lower diesel consumption and, consequently, lower emissions.

The journey continues at our juice processing facilities, with an ongoing drive to increase efficiency and





reduce reliance on fossil fuels. With this goal in mind, in March 2025 we celebrated the groundbreaking of a new biogas production plant in Bebedouro, São Paulo State, Brazil. The plant will be the first of its kind and scale in Brazil – and the largest in the world – capable of producing green energy from the treatment of citrus effluent. Expected to be operational by mid-2026, the plant will focus on the development of an innovative biotechnology capable of decomposing the organic load of citrus effluent and generating biogas, replacing the use of fossil fuels and reducing CO_2 emissions by more than 20% at its full capacity. In addition to decarbonization benefits, the system will also return 100% of treated water to the Paiol River.

In parallel, our efforts also cross oceans, thanks to our two dedicated juice vessels, one of which is trailing wind propulsion technology. In May 2025, as part of LDC's commitment to contribute to the global shipping industry energy transition, **we began operating the world's first vessel dedicated to juice transportation equipped with wind-powered propulsion technology.** The installation of four wind suction sails using eSAILs® technology - the largest of their kind, developed by Spanish startup *bound4blue* - is expected to reduce annual fuel consumption and CO_2 emissions by at least 10%.

All these initiatives underscore our commitment to shaping increasingly sustainable and resilient citrus juice supply chains, such that productivity, competitiveness and environmental responsibility coexist.

Ecuador's Heartbeat: Passionfruit, Community, and Sustainable Impact

Camila Tamayo and Harry Frei, Quicornac CSR Team

Key initiatives in 2024-2025 include:

- Training and certifying over 200 field workers in safety and crop protection management, accident prevention, and eco-friendly practices (including crop adaptability and rotation systems).
- Rolling out a rural vaccination campaign in partnership with the Ministry of Health, reaching hundreds of children and families in Vinces (our local city) and surrounding areas.
- Upgrading waste management systems by 30% and helped turn organic residues into compost for local growers.

Ecuador's global reputation for world-class passionfruit is built on decades of experience, innovation, and a deep-rooted commitment to community. At Quicornac Ecuador, sustainability isn't a buzzword; it's how we operate, day in and day out.

Our strategy connects local action to global impact, directly supporting:

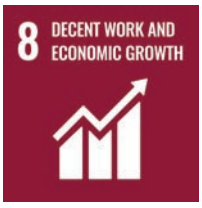
- **SDG 8 & 12:** Decent work and responsible production across all supply chain actors.
- **SDG 3:** Health and well-being, via robust workplace safety programs and campaigns in our communities.
- **SDG 15:** Land stewardship and ecosystem protection, driven by ongoing reforestation and biodiversity efforts.

The result?

A model where business growth directly lifts rural families, protects natural resources, and meets the highest global standards for quality and traceability.

"For us, every bottle of juice carries the effort of entire communities—and a promise to do better for people and planet," says a long-standing production supervisor.

Quicornac Ecuador's approach is proof that the future of fruit juice isn't just sustainable; it's regenerative, inclusive, and proudly local.



Growing with Purpose: Quicornac Perú and the Regenerative Passionfruit Revolution

Camila Tamayo and Harry Frei, Quicornac CSR Team

In Peru, where fertile valleys meet resilient communities, Quicornac is at the forefront of a regenerative agriculture movement. Recognizing that sustainable juice starts with sustainable farms, we launched a bold initiative in 2024 to expand passionfruit cultivation to hundreds of new hectares, targeting the country's most promising regions in alliance with local cooperatives and technical partners.

Our goals are clear and anchored in the SDGs:

- **SDG 1 & 8:** Creating dignified rural employment; already more than 400 people engaged in the supply chain.
- **SDG 2 & 12:** Promoting food security and sustainable production by encouraging long-term, field-proven seed varieties, delivering agroecological training to farmers, and promoting climate-smart agricultural practices.
- **SDG 13:** Mitigating and adapting to climate change by piloting cover cropping, efficient irrigation, crop rotation systems and integrated pest management.

In practice, this means:

- Delivering personalized technical support; with over 250 field visits just in the last year alone.
- Evaluating high-quality seeds and running workshops on soil health, efficient fertilization, and biodiversity.
- Partnering with associations to empower women and young farmers, making the passionfruit value chain more equitable.

Beyond the field, Quicornac Perú is committed to transparency, continuous improvement, and creating shared value.

"Every hectare we promote with care is an investment in the future of our people and our land," shares our leader agronomist of our Peruvian team.

As these new plantations take root, we're not just growing fruit; we're nurturing rural hope, environmental stewardship, and a culture of resilience.

Driving Innovation Through Circular Economy Solutions

Anat Even-Chen, Global Sustainability Manager. Prodalim

Innovation can be achieved by integrating sustainability into its products, platforms, and partnerships. A core part of this vision is advancing circular economy initiatives, optimizing the use of natural resources, and transforming sidestreams into valuable products.

Citrus Fibers: From By-Product to High-Value Ingredient

Launched in October 2024, Citrus Fibers represent a breakthrough in sustainable product innovation. Derived from citrus peels, a by-product of juice processing, these fibers are m ade through a s ustainable zero-waste process that maximizes resource efficiency. With multifunctional properties such as emulsification, gelling, and water retention, Citrus Fibers improve texture, enhance nutritional value, and align with consumer demand for clean-label solutions. Already applied in food, cosmetics, and animal nutrition, Citrus Fibers exemplify Prodalim's sustainability approach to upcycle side streams into functional ingredients that benefit both businesses and the planet.

Flavologic: Turning Agricultural Side Streams into Value

Another unique example of sustainable innovation is Flavologic, Prodalim's platform dedicated to fruit and vegetable solutions. Flavologic applies advanced processing technol-ogies to transform agricultural by-products such as fruit peels and pulp into natural ingredients for the food and beverage industry. This strategic initiative creates new revenue streams while supporting the development of functional and clean-label products, showcasing how circular economy thinking can spur both economic growth and environmental stewardship.

Leadership and Sustainability Driven Collaboration

Sustainability is not an abstract concept at Prodalim—it is a core strategic pillar directly embedded into the CEO's KPIs, ensuring executive accountability drives real-world impact. The objectives for 2030 specifically target sustainability partnerships, cross-functional collaboration, and measurable progress on environmental and social goals. A flagship example of this commitment is VivaPro Coloring Foodstuffs, a natural line of color solutions derived from fruits, vegetables, algae, and spices. Made with gentle processing methods to preserve the integrity of raw materials, VivaPro addresses rising global demand for clean-label, upcycled, and plant-based ingredients. Its wide application across beverages, bakery, confectionery, and plant-based meat also helps customers align with regulatory requirements and growing consumer expectations for transparency and responsible sourcing.

Towards a Regenerative Food System

Together, innovations such as Citrus Fibers, Flavologic, and VivaPro Coloring Foodstuffs underscore Prodalim's broader sustainability-driven strategy. By valorizing side streams, creating cross-industry collaborations, and embedding sustainability into leadership objectives, Prodalim is building a regenerative food system that bal-ances environmental stewardship with business growth. Through this innovation-driven approach, Prodalim re-affirms its role as a global pioneer in natural ingredient solutions, delivering sustainable value to industries, customers, and eco-conscious consumers worldwide.

Prodalim
Creating Natural Solutions

Flavologic
Flavor Solutions by Prodalim

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

From Waste to Resource: Quicornac Vietnam's Passionfruit Circular Economy in Action

Camila Tamayo and Harry Frei, Quicornac CSR Team

Vietnam's Highland region pulses with the energy of agricultural innovation, but behind every glass of passionfruit juice lies a challenge: what to do with thousands of tons of leftover peel and seeds? For the last 3 years, Quicornac Vietnam faced this reality... organic waste piled up, conventional composting couldn't keep up, and the environmental cost was mounting.

That's when we flipped the script. Guided by SDGs 2 (Zero Hunger), 12 (Responsible Consumption & Production) and 13 (Climate Action), our team turned passionfruit waste from an expense into a resource. Drawing on regional research and practical trials, we discovered that passionfruit peel and seeds are an untapped superfood for cattle, rich in fiber and fatty acids.

Working hand-in-hand with local farmers, Quicornac Vietnam:

- Diverted over 1,000 tons/year of passionfruit by-products into high-nutrient, affordable cattle feed.
- Cut livestock feeding costs for dozens of smallholder families.
- Shared hands-on training in fermenting and preserving peels for year-round use, closing the loop on waste and nutrition.

But the story doesn't stop at waste valorization. This program boosts rural incomes, reduces greenhouse gas emissions, and sets a new benchmark for circular agriculture in Southeast Asia.

"We used to see this as a disposal headache. Now, our waste is feeding both cattle and local prosperity," notes one of our field managers.

Quicornac Vietnam's model is a living example of how sustainability and business can—and must—work together. Every ton of peel reused is a win for farmers, the environment, and the future of fruit juice.

PEF: Measuring the Environmental Impact of Juice Concentrates

Christiane Hörmann, Sustainability Analyst, AUSTRIA JUICE

The fruit juice industry is showing growing interest in understanding the environmental footprint of its products. Manufacturers aim to reduce the environmental impact of their juice concentrates, while business partners demand transparent and comparable sustainability data. However, there are two fundamental challenges when collecting such data.

CO_2 Alone Doesn't Tell the Whole Story

When conducting a Life Cycle Assessment, the choice of methodology is crucial for the quality, comparability and credibility of the results. Standards like ISO 14040/14044 and a third-party "Critical Review" ensure data quality and make results credible for stakeholders. Another key aspect is whether the assessment uses proxy data or primary data collected directly from the company's own supply chain. As a result, comparing footprint results across companies is challenging, as methodologies often differ and many assessments rely on proxy data with limited accuracy.

The second key aspect is the informative value of the data itself. Currently, the Product Carbon Footprint (PCF) is the most commonly used approach. While it provides valuable insights into a product's greenhouse gas emissions – particularly for assessing Scope 3 emissions along the supply chain – CO_2 is only one part of the environmental picture.

Example: Mechanical weed control requires frequent tillage, leading to high diesel use and CO_2 emissions. Chemical alternatives save fuel but leave pesticide residues, harming ecosystems through ecotoxicity. A purely CO_2-centric assessment may suggest that pesticide use is the "more environmentally friendly" option, as it reduces emissions. However, this narrow focus overlooks the broader environmental consequences associated with chemical inputs. Such conflicts of interest remain invisible in a PCF analysis. This is where the Product Environmental Footprint (PEF) becomes essential. Developed by the European Commission, the PEF provides a holistic assessment framework that captures the full spectrum of environmental impacts. The PEF assesses multiple indicators like water use, land use, eutrophication, and resource scarcity, providing a solid basis for informed and balanced environmental decisions.

How AUSTRIA JUICE applies the Product Environmental Footprint

At AUSTRIA JUICE, sustainability is an integral part of our corporate identity. As one of the leading manufacturers of fruit juice concentrates, we took an important step to understand our environmental impact in detail: together with an independent external partner, we assessed the Product Environmental Footprint (PEF) of three of our core products – apple, elderberry, and sour cherry juice concentrates.

"CO_2 is just one part of the picture – our goal is to gain a better understanding, so we can design measures that fully consider the range of environmental effects." **– Jörg Schultz, Director of Sustainability & Continuous Improvement | AUSTRIA JUICE**

The calculations are based on primary data collected directly in the field and in production. Since our Hungarian site has the highest proportion of direct farmer relationships, we decided to conduct the study there. Our agronomists collaborated with a representative sample of farmers to gather precise data, including harvest volumes, the use of plant protection products and fertilizers, diesel consumption, and transport distances to the production facility. At the same time, we collected detailed consumption data from our production facility in Vásárosnamény (HU), such as electricity and heat demand, water use, and the use of process aids. All data were carefully attributed to the respective products to ensure an accurate representation of their environmental impact.

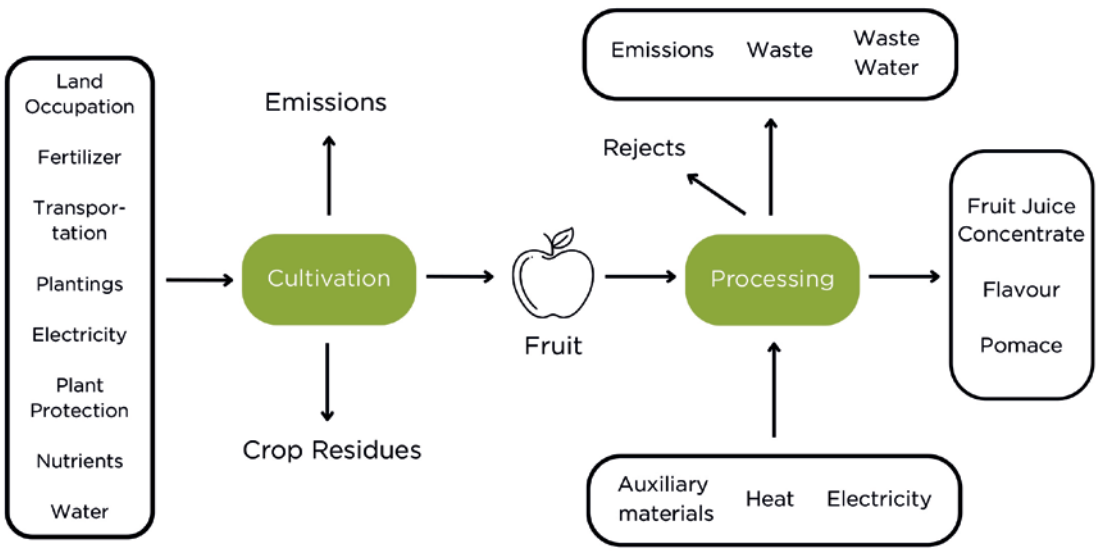
The system boundaries applied cover the entire process from raw material cultivation to juice concentrate production. This is the so-called Cradle to Gate approach. Packaging and distribution were deliberately excluded, as they vary greatly depending on customer requirements and cannot be standardized. The methodology followed ISO 14040/14044 standards. Greenhouse gas calculations were made using IPCC factors for GHG accounting, and an independent Critical Review was conducted to validate the results.

From Assessment to Continuous Improvement

The results of the PEF study provide us with a solid baseline for understanding the environmental impact of our products. These results are not intended for direct product comparisons, as cultivation and processing conditions differ significantly between apple, elderberry, and sour cherry. Instead, the insights serve as a reference point for future analyses and as a basis for evaluating the effectiveness of specific emission reduction measures.

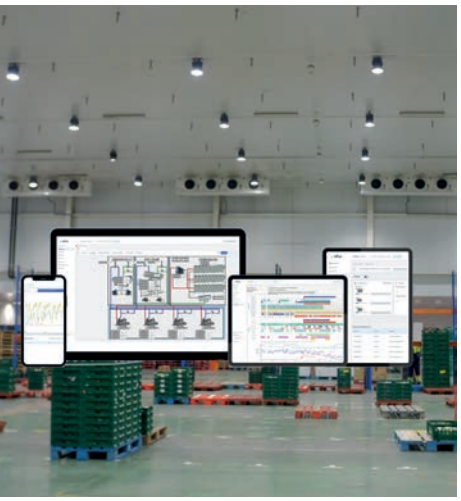
The next step is to expand the scope to other countries and additional product categories, ensuring a broader and more comprehensive picture of our environmental footprint across the product range. Building on the PEF results, we will trial eco-friendly alternatives in our open-air laboratories, such as low-impact, organic fertilizers and use of natural antagonists. This is followed by a regenerative agriculture approach to further enhance soil health and humus build-up. The PEF helps us take a holistic approach to making environmental decisions more informed and fact-based.

System boundaries of the PEF



Smart refrigeration for a more sustainable juice production

Jose Luis Fernández Pazos, President, Gradhoc Smart S.L.



The manufacturing of fruit and vegetable juices is a **complex and highly diverse activity.** It comprises a wide range of end products — from juices and purées for human consumption to intermediate formulations and by-products destined for cosmetics or animal feed sectors. This complexity is compounded by **fluctuating energy costs, the integration of renewable sources and the growing impact of climate variability.** At the same time, despite the nutritional benefits of juices supported by scientific evidence, the industry continues to face negative consumer perceptions, making it even more critical to uphold high-quality standards and implement efficient processes that foster trust.

In this context, **industrial refrigeration plays a pivotal role** throughout the entire production cycle — from post-harvest preservation to processing, cooling, storage and final distribution. **Maintaining the integrity of the cold chain** at every stage is essential. **Strict thermal control ensures food safety and preserves the organoleptic properties of the product.** By managing temperatures according to the specific characteristics of each raw material, **oxidation, aroma loss and microbiological risks are minimised.** This degree of control also helps to reduce food waste.

However, this level of precision often comes at a high energy cost, with **refrigeration typically representing the largest operational expense** in juice production — **in some cases even reaching 60% of total consumption.** In many facilities, refrigeration systems are left running even when not required, operating with minimal optimisation and lacking intelligent, data-driven control strategies for key parameters such as temperature, runtime or defrost cycles.

This challenge is further compounded by the need to **digitalise technical expertise, coordinate refrigeration management with the availability of renewable energy, and adapt to fluctuating production demands —** all while technical teams spend a significant portion of their time on manual oversight and reactive interventions, rather than strategic monitoring and decision-making.

The solution: predictive and automated control

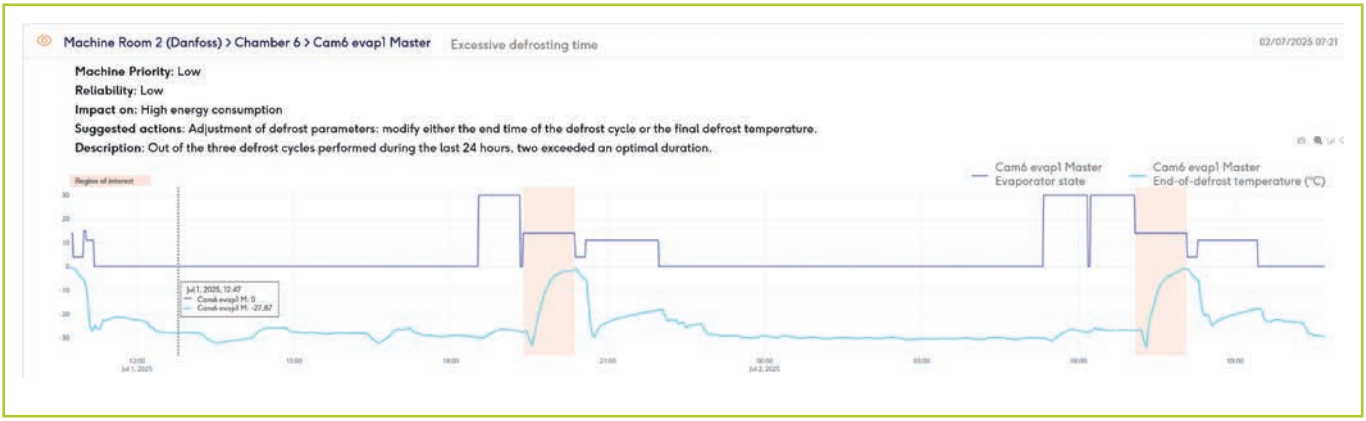
To address the wide variability of production conditions, Gradhoc has developed **a digital platform that combines a digital twin of every industrial plant with artificial intelligence, algorithms capable of anticipating deviations and optimising refrigeration performance in real time.** Unlike conventional BMS systems, this platform **integrates weather forecasts, photovoltaic generation data and dynamic electricity pricing** to implement automated control strategies across cold rooms, chillers and climate-controlled areas — maintaining these systems at peak efficiency at all times.

Case study: Iberfruta

Iberfruta, a leading company of fruit and vegetable semi-finished products, faced the challenge of reducing energy consumption while improving the sustainability of its operations dedicated to purées, particulate products and juices.

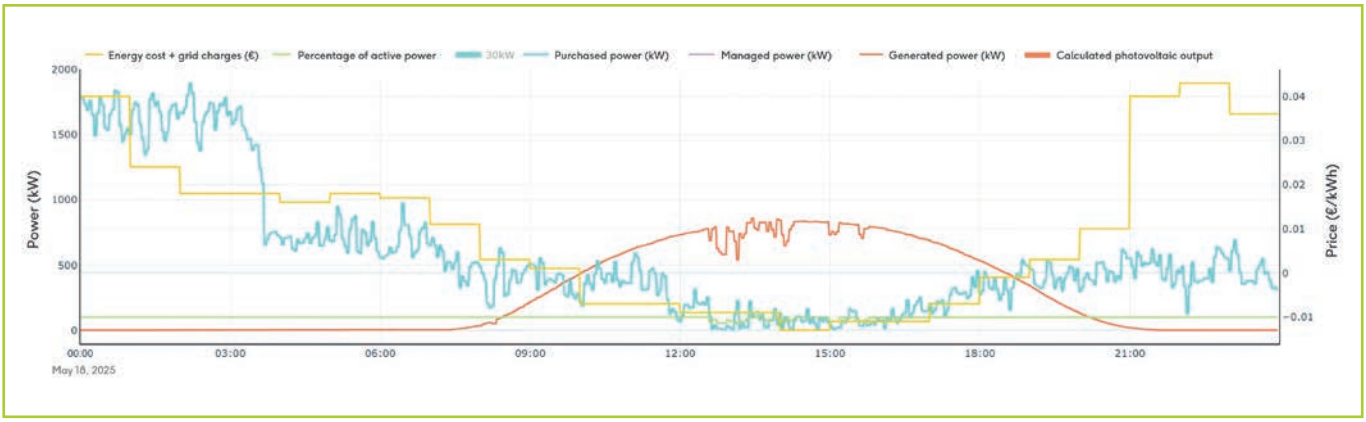
With the implementation of Gradhoc's predictive platform, the company was able to **centralise remote supervision of multiple plants, detect early anomalies and intervene proactively before incidents occurred.**

A clear example is the **predictive monitoring of evaporator defrost cycles.** In the graph shown **(Graph 1)**,



Gradhoc's digital twin identified extended defrost durations compared to the optimal reference. This pattern acts as an early warning of system inefficiency, which, if left uncorrected, could lead to increased electricity use and potential mechanical failures.

From an **energy point of view (Graph 2),** the system **prioritised the use of solar power,** activating cold storage facilities during peak photovoltaic production and avoiding unnecessary feed-in to the grid. **This approach enabled the recovery of over 1,800 kWh in a single day — equivalent to 1.62 tonnes of CO_2.** Additionally, the algorithm redistributed electrical demand towards off-peak periods, combining low-tariff time slots with each chamber's thermal inertia, while fine-tuning setpoints and compressor usage. **This resulted in savings of up to 1,600 kWh per 8-hour operating cycle in freezing tunnels.**



According to **Rafael Pérez Ruiz,** General Manager of **Iberfruta:**

"Gradhoc gives us a single point of access to remotely manage our installations and anticipate anomalies, which helps us reduce food waste and optimise energy resources."

Thanks to this digitalisation process, Iberfruta achieved a **20–30% reduction in energy consumption, cut CO_2 emissions by around 25%,** and improved process reliability by significantly lowering unplanned downtime and operational disruptions.

This case clearly demonstrates that integrating artificial intelligence and digital twins into industrial refrigeration is a highly effective way to manage operating costs, meet sustainability goals and strengthen confidence in the quality of juice products.

Today, the fruit and vegetable processing industry has access to solutions that combines efficiency with environmental responsibility — fully aligned with **Sustainable Development Goals 11, 12 and 13** — reinforcing its leadership as an innovative and future-ready sector.

Packaging in Transition: Navigating Responsibility in a Shifting Regulatory Landscape

Shannon Doherty-Andall, Sustainability Manager.
Australian Beverages Council

Across the global fruit and vegetable juice industry, packaging is at the centre of an increasingly complex sustainability conversation. No longer just a question of what material is most suitable for business and operational needs, today's packaging decisions are shaped by a swirl of regulatory shifts, changing consumer expectations, and inconsistent recycling infrastructure across jurisdictions and regions. For businesses navigating this terrain, the challenge lies not only in reducing environmental impact, but in doing so while maintaining functionality, compliance, and brand trust.

Extended producer responsibility (EPR) schemes and beverage container schemes, often called Deposit Return Schemes (DRS) or Container Deposit Schemes (CDS) are evolving rapidly, often out of sync with each other. In Australia, CDS frameworks are well established in some states and just launching in others, with every state and territory now participating. Across all continents, businesses are now grappling with widely differing regulatory requirements, recovery systems, and design standards, making packaging decisions more complicated and potentially limiting expansion or cross-border growth. This variation also forces companies to make strategic choices about where and how they innovate, often requiring localised packaging strategies that align with disparate regulatory environments while still supporting broader sustainability objectives.

Juice producers must now design with recyclability in mind across several fronts. What is recyclable in kerbside systems may not be compatible with DRS/CDS collection infrastructure, and vice versa. Local differences in processing capabilities further complicate matters, meaning that a pack optimised for recovery in one region might be considered problematic in another. For global producers, this presents a practical barrier to consistency in procurement and packaging design. It also challenges companies to be more transparent about the complex lifecycle of each packaging format.

The Global Plastics Treaty was once seen as an imminent pathway to international harmonisation, offering a single framework for design standards, recovery systems, and reporting. While it is still regarded as the best chance for alignment, its future is now uncertain, leaving businesses to contend with divergent national and regional rules often developed on their own.

Adding to this complexity are new regulations aimed at controlling greenwashing and driving chemical safety. In the EU, the Packaging and Packaging Waste Regulation (PPWR) is reshaping what materials can be used, how recyclability is defined, and what must be disclosed. At the same time, a rising number of countries are banning or phasing out substances of concern, such as BPA, PFAS, and other additives. Producers must not only meet today's compliance requirements but anticipate what may soon be restricted.

Juice manufacturers also face specific challenges in aligning processing methods with packaging formats. Homogenisation can enhance product texture and stability but requires packaging that maintains product consistency without separation. Aseptic and ultra-high-temperature (UHT) treatments extend shelf life and reduce energy use, making them well suited for cartons and flexible formats. However, these formats can be difficult to recycle in some jurisdictions, and not all regions have the necessary infrastructure to handle aseptically processed products.

Emerging techniques such as high-pressure homogenisation and non-thermal processes like UV or ultrasound treatment present promising lower-energy options, but they demand more durable packaging with higher barrier performance. This can limit material choices or complicate recyclability. As a result, juice manufacturers must design processing and packaging strategies in tandem, balancing shelf life, energy inputs, product safety, and recovery pathways across multiple markets.

Juice companies across the industry are already taking meaningful steps to address these complexities, and there are clear lessons emerging from first-mover approaches. Mapping packaging portfolios against regulatory trends helps identify both risks and areas for innovation. Developing modular packaging systems allows companies to maintain core efficiency while adapting to local rules. Strong supplier engagement and materials traceability can make reformulation and rapid response more feasible. Investing in end-of-life data and building partnerships across the value chain strengthens recovery outcomes and supports long-term resilience.

These proactive strategies are not just about staying ahead of regulation. They position businesses as leaders in a crowded market. For juice products in particular, where packaging carries brand identity and sustainability messaging in equal measure, every packaging decision becomes a strategic signal. Companies that prioritise adaptable design, recovery performance, and transparency are already finding advantages in both compliance and consumer trust.

The fruit and vegetable juice industry is no stranger to adaptation. As the next wave of packaging policy takes shape, agility and collaboration will be essential. The path forward is not just about reacting to change. It is about shaping it through thoughtful packaging design, responsible sourcing, and informed engagement across the global sustainability agenda. As an industry that has long valued environmental stewardship and the responsible use of natural resources, we are well placed to lead this next phase of packaging evolution with clarity, confidence, and purpose.

Clay Pot Irrigation: An Ancient Technology for Sustainable Agriculture

Hernán Chiriboga, IICA's Representative in Chile

Water scarcity is one of the most pressing challenges of our time. As communities seek sustainable solutions, ancient wisdom offers a powerful answer. Clay pot irrigation, a technique used for over 4,000 years across Asia, Africa, and the Americas, is making a comeback—and it's more relevant than ever.

How It Works

This method involves burying unglazed porous clay pots filled with water. Through capillarity, moisture is slowly released into the soil, allowing plant roots to absorb water as needed. The result is a natural irrigation system that only needs refilling once a week.

Benefits

- Saves up to 60% of water by minimizing evaporation, runoff, and leaching.
- Requires no energy, expensive infrastructure, or external inputs.
- Supports 4–5 vegetables per 2-liter pot for a week.
- Promotes local craftsmanship and cultural heritage.
- Ideal for small-scale farmers and urban gardeners.

Real-Life Applications

In Chile, the Inter-American Institute for Cooperation on Agriculture (IICA) has promoted this technique as a viable alternative for small-scale farming. Over 2,000 pots have been produced by artisans in Pomaire and distributed across regions from Arica to Aysén.

Farmers report significant water savings and greater autonomy in managing their crops. The initiative has also reached agricultural schools, fostering early awareness among students about water conservation and sustainable food production.

Claypots for Rural Women Farmers, School Students, and City Influencers

At CET BioBio, an agroecological practice center in the Bío Bío region, clay pots are now recognized as part of the water conservation and management techniques they employ. These tools are low-cost, easy to apply, and focused on supporting small-scale family farmers. Additionally, students from technical and specialized agriculture schools visit the farm daily to learn about these techniques.

CET BioBio

At Costa Rica School. Santiago "*Our students are learning the value of water and sustainability through hands-on experience with clay pots.*" – school teacher

Costa Rica School. Santiago

Carmen Garrido is a notable Chilean influencer who, besides producing and selling food from her own home under her well-established brand, La_Coca, is a prominent figure on social media. She engages an urban audience interested in agriculture, cultivation, seed exchanges, and promoting healthier food options.

Carmen learned about the clay pot irrigation system promoted by IICA through this initiative, and she played a key role in helping to viralize and promote it on her social media platforms. Her efforts received widespread acceptance from the general public, which led to the realization of the need to commercialize this type of system directly. As a result, a formal sales channel was established, and these clay pots are now sold at the Centro de Santiago in the Tienda Mundo Rural of INDAP.

Carmen Garrido

Urban Gardening Made Easy

Clay pots are perfect for mobile gardens in urban and peri-urban settings. You can grow food in your kitchen, terrace, or patio. We call them 5:5 gardens because they take less than 5 minutes to set up and cost less than 5 dollars to grow 5 vegetables.

- Watch the main features of this productive system: https://youtu.be/LoMvyLHdwkQ?si=R98K-yJ7EJhwROVN
- Learn how to create your own mobile garden: https://youtu.be/-EymRJkhPEw?si=7oaupAsO5WKQRfKV

Future Potential

IICA's revival of this ancestral technique shows that modern challenges don't always require complex technologies. Traditional knowledge, adapted to today's realities, can offer sustainable, culturally appropriate solutions.

Join the movement! Try clay pot irrigation in your own garden, support local artisans, and share this knowledge with your community. Together, we can build a more resilient and sustainable future.

6 CLEAN WATER AND SANITATION

Sustainable Juice Platform: Working Together for a Better Juice Sector

Mario Diaz, Sustainable Juice Platform Chair

Over the past year, the Sustainable Juice Platform (SJP) has been busy refreshing its vision and strategy to better reflect what we stand for: building a juice sector that's not only sustainable and resilient, but also socially responsible. We've done this by working closely with our members and partners, and by putting Environmental, Social, and Governance (ESG) principles at the heart of everything we do.

Our updated mission is all about collaboration. We're here to help the sector tackle shared challenges—whether environmental or social—and to find opportunities for improvement that benefit people, the planet, and business. As climate change intensifies, we're committed to supporting both mitigation efforts to reduce emissions and adaptation strategies that build resilience across juice supply chains.

Turning Strategy into Action

We're proud of the projects we've been working on—especially those that make a real difference for workers and communities.

In Poland and Spain, we've been helping improve the experience of migrant workers in the agricultural sector. One of our key initiatives has been adapting the Just Good Work (JGW) mobile app for both countries. JGW gives workers and job seekers clear, practical information—from their rights at work to tips on housing, culture, and daily life. The app also lets workers share feedback in real time, helping our members spot risks and adjust interventions between audits.

We've shaped our strategy around three key areas:

Mitigation: Driving Continuous Improvement
We're identifying ESG risks and impacts across our common value chains and looking for ways to turn those into opportunities for sustainable growth.

Project Initiation: Scaling Positive Impact
We're supporting collaborative projects that address common challenges and spark innovation across the sector.

Education: Sharing Knowledge and Building Skills
We're creating space for learning, sharing success stories, promoting new ideas, and helping our members build the expertise they need to lead on sustainability.

Members of the SJP during the 50th anniversary of Expocitrus

In Spain, the app—called App Foros—was launched in partnership with the Ethical Trade Forums, a network that brings together producers, retailers, importers, exporters, NGOs, unions, workers, and other stakeholders. In 2025, we're focusing on expanding the app's reach to workers from Latin America and Morocco, supporting them during recruitment and before they travel to Spain.

You can check out the app at www.justgood.work or use the QR (left).

We also had the great honor of being one of the organizations funding the 50th anniversary of Expocitrus, one of Latin America's most important citrus and agribusiness events. This event was successfully held by the Sylvio Moreira Citrus Research Center (CCSM/IAC). Over four days, farmers, research institutes and key players in the juice industry had the opportunity to share knowledge and identify areas of collaboration. Co-funding this event is one of the initiatives that the SJP is leading as part of our Brazilian Working Group to forge stronger ties with Brazilian partners in the juice sector. In the next months we will share the activity plan for 2026, including informative sessions and areas of collaboration with the OJ sector.

We're excited about the progress we've made—and even more about what's ahead. The Sustainable Juice Platform is all about working together to make a real impact. Whether it's through projects, partnerships, or shared learning, we're committed to helping shape a juice sector that's better for everyone.

From Natural to Circular: How Sustainability Is Reshaping the Juice Industry

Inga Klebanskaja, Senior Sustainability Consultant, Euromonitor

The juice industry is shifting from volume to value through health and wellness and sustainability

The global soft drinks industry remains one of the most dynamic consumer goods categories. According to Euromonitor International's Soft Drinks research, in 2024, off-trade volume consumption reached 682.6 billion litres, with growth projected at a healthy 3.4% CAGR between 2024 and 2029. Within this vast industry, juices represent close to 60 billion litres, yet their trajectory looks very different. The category registered a marginal decline of -0.1% in 2024 compared to the previous year and has been essentially flat over the last five years (0.0% CAGR between 2019 and 2024). Forward-looking expectations are modest, with only 1.1% CAGR forecasted for 2024–2029.

At first glance, this may suggest a category running out of steam. Yet beneath the surface, the juice industry is undergoing a transformation that is less about volume and more about value creation, both health and wellness as well as sustainability-driven. The strongest proof of this lies in the rapid rise of coconut and other plant-based waters, growing by 8.9% in 2024 and projected to expand by 5.0% annually through 2029. This shift underlines how consumer demand increasingly blends functional hydration and natural positioning.

In soft drinks, sustainability is now baseline, while in juice it still drives growth

According to data from Euromonitor International's Passport Sustainability system, which tracks products with sustainability claims across 25 markets and 53 consumer packaged goods categories, globally, in soft drink, products with sustainability claims generated USD 93.5 billion in 2024, growing at an 8.0% CAGR since 2020. However, the category has seen that products carrying sustainability claims only marginally outperform those without, indicating that natural, non-GMO, and recyclable packaging have become status quo claims. For soft drinks, sustainability increasingly blends into the category norm rather than setting brands apart.

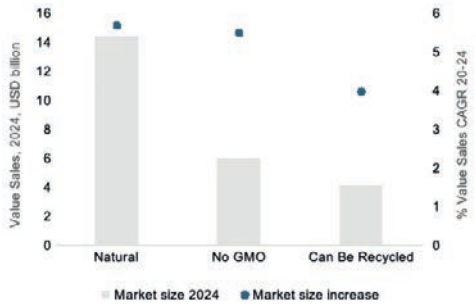
Ethical sourcing and certifications are the fastest-growing drivers in juice

In juice, the picture is different. Products carrying sustainability claims have consistently outperformed those without. Here, sustainability remains a meaningful growth lever, reflecting stronger consumer alignment between juice, health, and responsible sourcing.

Source: Euromonitor International, Passport Sustainability data updated in May 2025. Global includes 25 markets: Argentina, Australia, Brazil, Canada, Chile, China, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Mexico, Netherlands, Poland, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sweden, UAE, United Kingdom, USA; Food and Drink includes 24 categories within Snacks, Cooking Ingredients and Meals, Dairy, Soft and Hot Drinks and Staple Foods.

In fact, "natural" remains the single most widely used claim across juices, growing by 2.9 percent in 2024 alone to reach USD 14.4 billion in value. Other leading claims include non-GMO and recyclable packaging.

Yet the fastest growth is now happening in ethical sourcing and certification-based claims. Fair for Life, Fairtrade, and B Corp are all expanding rapidly in juices, driven by consumer desire for purposeful procurement, traceable supply chains, and verified impact. Harmless Harvest leads with Fair for Life certification, pioneering ethical coconut farming and regenerative agriculture. These claims move beyond health and packaging into the realm of social and environmental justice, offering juice brands an opportunity to stand out at a time when baseline claims are no longer enough.



Source: Euromonitor International, Passport Sustainability data updated in May 2025.

Source: Euromonitor International, Passport Sustainability data updated in May 2025. Note*: Only Claims on Juice with sales exceeding USD 200 million in 2024 are considered when identifying the fastest-growing claims. This is to help eliminate niche claims.

Interestingly, while consumers continue to demand eco-friendly packaging, the leading claim in this group — "can be recycled" — actually declined by 7.2 percent in 2024. This signals growing scrutiny. Recyclability is no longer enough; consumers increasingly expect brands to move further into circular models, using recycled materials, designing for zero waste, and pursuing certification schemes such as FSC.

Regional differences highlight opportunities for premium sustainability positioning

The sustainability story in juice varies significantly across regions. In the United States, natural, recyclable, and non-GMO claims are well-established, but increasingly seen as baseline expectations rather than points of differentiation. European markets, particularly the UK, France, Germany, and Sweden, combine high disposable incomes with strong cultural receptivity to health and sustainability, making eco-conscious claims a meaningful driver of purchase decisions. Sweden stands out as a bellwether, where sustainability is central to consumer behavior and premium positioning.

Brazil represents a growth market where sustainability resonates closely with health, safety, and naturalness. Ethical sourcing and chemical-free formulations are particularly valued, demonstrating that emerging markets can adopt sustainability when it aligns with local consumer priorities.

The Asia-Pacific region presents a more complex challenge. Countries such as Japan, China, and Indonesia record the lowest per capita spend on sustainable juices. Here, juices face stiff competition from entrenched traditions of tea, soy-based drinks, and functional beverages, and consumers are generally less willing to pay a premium for sustainability. Yet there is a paradox: China and Japan actually have the highest median prices for sustainable juices globally. This points to a niche, aspirational consumer base that does exist, but also highlights affordability as a key barrier to scaling sustainability in the region. The opportunity for brands in Asia-Pacific lies in balancing the prestige of premium sustainable products with greater accessibility, creating a path for broader consumer adoption.

From natural to circular, traceability and story-telling are essential

The trajectory of sustainability in the juice industry can be understood as an evolution across three phases. The first was driven by naturalness and clean label, focusing on removing artificial ingredients and offering all-natural formulations. The second integrated health and planet considerations, linking diet-related benefits to environmental commitments through organic, non-GMO, and plant-based claims. The third, now emerging, emphasizes circularity and accountability: recycled content, certified sourcing, responsible forestry, and zero waste.

For brands, the implications are clear. Invest in traceable, credible sourcing claims — and tell the story. Certification is only as powerful as the narrative that activates it. In soft drinks, sustainability claims like recyclable packaging and "natural" have become category norms, and no longer provide strong differentiation. To stay competitive, soft drink brands must now move toward deeper transparency, circularity, and social responsibility. In juice, however, sustainability still functions as a direct growth driver. Brands can leverage these claims more explicitly to build premium positioning, consumer loyalty, and pricing power. While global juice volumes remain stagnant, the category is far from irrelevant. Its future lies not in chasing mass consumption growth but in redefining value through sustainability claims.

The Farm Sustainability Assessment

The Sustainable Agriculture Initiative Platform (SAI Platform) is a global non-profit organisation transforming the global food and beverage industry to source and produce more sustainably. By fostering industry alignment and encouraging collaborative action among its 190 members, SAI Platform is pioneering practical solutions that improve social, environmental, and economic outcomes on farms worldwide.

Central to our work is the Farm Sustainability Assessment (FSA), a globally recognised tool that enables farm groups worldwide to assess, improve and validate on farm sustainability performance against a common reference point.

The FSA is a comprehensive toolset that supports continuous improvement across the full spectrum of sustainability topics, including labour conditions, soil management, nutrient management, crop protection, and biodiversity. At its core is a self-assessment questionnaire (SAQ) of 109 questions across 11 themes, designed not only to evaluate current practices but also to identify opportunities for ongoing progress. The FSA is flexible, supporting both individual farms and farm groups, and enables participants to track their development through three performance levels: Bronze, Silver, or Gold. To ensure credibility and enable verified sustainability claims, farms can undergo third-party verification through one of our 12 approved Verification Bodies.

A key driver of FSA adoption has been our benchmarking programme, which currently includes over 100 benchmarked schemes. This programme allows companies to use the FSA as a reference point in sustainable sourcing requirements, enhancing alignment and efficiency across supply chains.

In 2024, FSA implementation continued its growth trajectory, with a record 245 verifications completed. Today, approximately 171,000 farms are part of verified Farm Management Groups, spanning 61 countries and six continents, with over 190 crops verified to date. Notably, new crops such as cardamom and black pepper were added in 2025. The FSA's reach has expanded significantly in emerging markets, particularly across East and Southern Africa, while traditional strongholds such as France were surpassed by China, India, and Brazil in terms of verification numbers.

FSA and the Juice Sector

The juice sector faces unique sustainability challenges due to its reliance on large-scale, monoculture crops, high water consumption, and complex supply chains spanning multiple continents. Meeting these challenges requires standardised, credible frameworks that allow producers, suppliers, and buyers to track performance consistently.

The FSA has become a cornerstone for the juice sector in enabling sustainable sourcing and improving farm-level practices. By providing a globally recognised framework, the FSA helps companies demonstrate progress, reduce environmental impacts, and improve social outcomes on the ground. In particular, the FSA facilitates verifiable volume claims for responsibly sourced juice ingredients, which is increasingly important for meeting corporate sustainability commitments and consumer expectations.

For the Brazilian orange juice sector, direct implementation of the FSA with third-party verification has become the market standard. This adoption traces back to a Solidaridad-led project launched in 2019, aimed at transitioning the orange juice industry in Brazil toward the FSA framework. Leading companies, including , Louis Dreyfus Company (LDC), Citrosuco and Cutrale have adopted the FSA as their primary sustainability tool. For example, all of LDC's productive orange farms in Brazil are FSA Gold verified, while Citrosuco reported in its 2021 sustainability report that all of its orange farms had achieved FSA Gold verification.

In 2024, the FSA demonstrated a strong footprint in Brazil's orange juice industry, with 65 verified Farm Management Groups covering 361 farms of considerable size. Among these farms, 69.2% achieved Silver, 26.2% Gold, and 4.6% Bronze verification levels. This demonstrates that the majority of orange farms are performing at intermediate or advanced sustainability levels, with a significant share achieving full Gold verification.

Across the global juice sector, the FSA is increasingly used as a reference for sustainable sourcing policies, supplier engagement, and continuous improvement initiatives, supporting supply chain resilience and responsible production. By aligning the industry on a common sustainability standard, the FSA reduces duplication, improves comparability, and enables companies to scale positive environmental and social impacts across the juice supply chain.

Driving Sustainability in the Global Juice Industry: IFU's Commitment and Collaborative Action

Aintzane Esturo, IFU Technical Director

Sustainability has become a defining priority for the food and beverage sector, and the global juice industry is no exception. As a neutral platform connecting producers, suppliers, researchers, and stakeholders across the value chain, the International Fruit and Vegetable Juice Association (IFU) plays a key role in shaping the industry's journey towards a more sustainable future. Through strategic initiatives, collaborations, and thought leadership, IFU continues to strengthen its commitment to environmental responsibility, innovation, and circular practices.

The Citrusbusters Project: Tackling Global Challenges in Citrus Production

One of the most pressing sustainability challenges lies in agriculture itself. The **Citrusbusters project,** financed by the EU, demonstrates the industry's proactive response to plant disease threats that endanger citrus production worldwide. The project addresses the urgent threat posed by Huanglongbing (HLB), caused by *Candidatus liberibacter* and transmitted by the psyllid *Trioza erytreae,* together with citrus black spot (*Phyllosticta citricarpa*). Although these pests are not yet widespread in Europe, their potential impact has already raised alarm as international trade and shifting climate conditions increase the risks of introduction and spread. By bringing together experts and stakeholders to share knowledge and develop innovative solutions, the project is not only protecting the citrus sector but also safeguarding the resilience and stability of juice supply chains.

citrusbusters.eu – Integrated Prevention and Biocontrol Solutions for the Most Devastating Citrus Pests

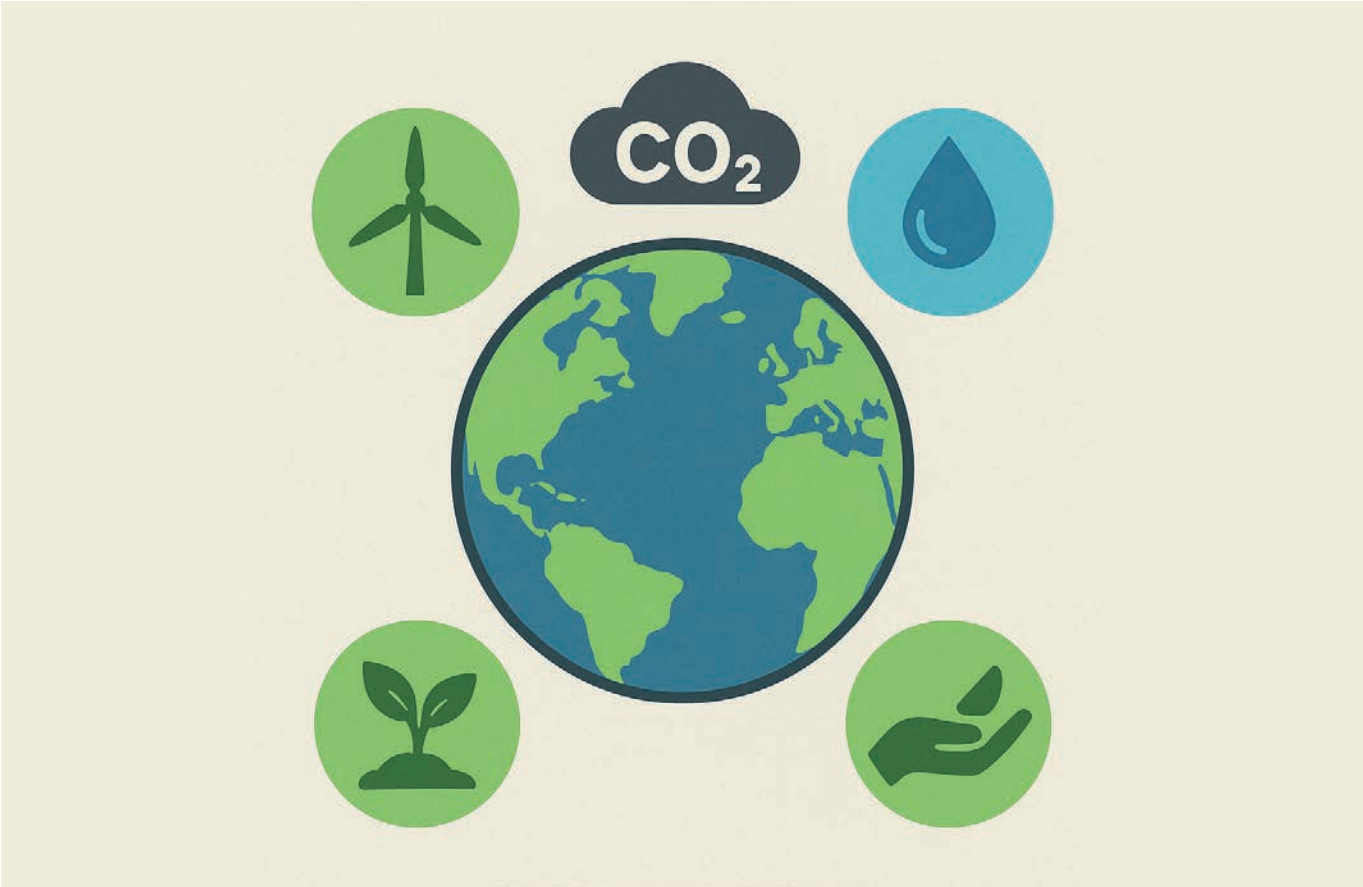
Innovation and Collaboration in the Non-Alcoholic Beverage Sector

As part of its thought leadership, IFU actively engages in international platforms that foster innovation. At the **Food4Future World Summit,** IFU moderated the session on **"Drivers for Innovation in the Non-Alcoholic Sector."** This contribution highlighted how sustainability, consumer health, and new technologies are converging to reshape the juice industry. By facilitating dialogue among innovators, IFU helps accelerate the transformation of the sector towards cleaner, smarter, and more responsible practices.

External Advisory Board: Agro4Agri Project

Sustainability also requires cross-disciplinary cooperation. This project explores how digital tools, data-driven practices, and technological innovation can help reduce environmental impact while ensuring food security. Agro4Agri is focused on developing efficient, environmentally friendly agrochemical solutions, and aims to cut nutrient use by over 40% and pesticide use by more than 50%. IFU's position as a member of the External Advisory Board for the Agro4Agri project reflects its ongoing dedication to science-based progress in agriculture. Through this role, IFU contributes its expertise and provides guidance that helps align industry practices with sustainable development goals.

Agro4Agri



Net Zero and Circular Economy Dialogues

The path to sustainability requires bold commitments to climate action and resource efficiency. IFU reinforced these priorities through its participation in two major events in 2025: the **Net Zero Food and Beverage Forum in Berlin** and the **Circular Economy Summit in Bilbao.**

- At the Net Zero Forum, IFU contributed to discussions on decarbonization strategies, energy efficiency, and how the juice sector can contribute to global carbon neutrality goals. The juice sector industry efforts in reducing emissions, improving energy efficiency, and promoting sustainable raw material sourcing were highlighted.
- At the Circular Economy Summit, IFU joined industry leaders to explore new business models, recycling initiatives, and circular practices that minimize waste and maximize resource use across the juice supply chain.

Citrus Connect Conference in Spain

This international event uniquely combines technical presentations with innovation and networking, offering a comprehensive vision of the citrus sector. Addressing the challenges facing the industry, IFU pointed to climate change and diseases such as citrus greening, which threaten production in key production areas. Despite these hurdles, the industry has the capacity for innovation and adaptation. The adoption of agricultural technologies and precision farming to enhance efficiency and climate resilience are key to face the challenges. Furthermore, the potential of circular economy practices, such as upcycling citrus by-products for use in food and cosmetics, as avenues for adding value and reducing waste are of utmost importance.

Conclusion: A Shared Responsibility

Sustainability is not a single initiative but an ongoing journey that requires collaboration across borders, sectors, and disciplines. By engaging in research projects, moderating key industry discussions, and actively participating in sustainability-focused forums, IFU demonstrates its commitment to leading this transition.

The organization's involvement in projects, together with its active presence at global summits and conferences, underlines a clear message: the juice industry can and must play a vital role in shaping a more sustainable, resilient, and innovative future.

IFU

International Fruit and Vegetable Juice Association

www.ifu-fruitjuice.com

23 Boulevard des Capucines
75002 Paris, France
Mobile +55 11 91844 6776
tatiana@ifu-fruitjuice.com