

RESPOND

COP28 UAE





Prince Sultan Bin Abdulaziz International Prize for Water

Recognizing Innovation



Winners for the 10th Award (2022)



Creativity Prize

1) The team led by Thalappil Pradeep (Indian Institute of Technology, Madras, India) for the creation and successful deployment of environmentally friendly “water positive” nanoscale materials for the affordable, sustainable and rapid removal of arsenic from drinking water. Team members include Avula Anil Kumar, Chennu Sudhakar, Sritama Mukherjee, Anshup, and Mohan Udhaya Sankar.



Dr. Thalappil Pradeep



Dr. Dionysios D. Dionysiou

2) The team led by Dionysios D. Dionysiou (University of Cincinnati, USA) for the development of innovative advanced oxidation technologies and nanotechnologies for environmental applications, particularly in the removal and monitoring of emerging contaminants. Team members include Wael H.M. Abdelraheem, Abdulaziz Al-Anazi, Jiong Gao, Ying Huang, and Vasileia Vogiazzi.



Surface Water Prize

Dennis D. Baldocchi (University of California Berkeley, USA)

for the development and implementation of effective models to understand, evaluate and predict evapotranspiration and water-use efficiency in various environments under climate change conditions.



Dr. Dennis D. Baldocchi



Groundwater Prize

Linda M. Abriola (Brown University, USA)

for pioneering research on toxic Dense Non-Aqueous Phase Liquids (DNAPLs) in groundwater, ranging from the simulation of their fate to effective methods for cleaning contaminated sites.



Dr. Linda M. Abriola



Alternative Water Resources Prize

The team of Menachem Elimelech (Yale University, USA) and Chinedum Osuji (University of Pennsylvania, USA)

for wide-ranging advances in nanostructured materials for next-generation water purification, focusing on implementation issues like manufacturing, sustainability, self-assembly, and biofouling.



Dr. Menachem Elimelech



Dr. Chinedum Osuji



Water Management and Protection Prize

The team led by Matthew McCabe (KAUST, Thuwal, Saudi Arabia)

for employing CubeSat constellations in the sustainable management and security of linked water-food systems, along with estimates of agricultural water use at unprecedented spatial and temporal resolutions and with global coverage. Team members include Bruno Aragon (KAUST) and Rasmus Houborg (Planet Labs, USA).



Dr. Matthew McCabe

Invitation for Nominations

11th Award (2024)

Nominations open online until 31 December 2023

www.psipw.org

e-mail: info@psipw.org



COP28UAE

COP28 President Dr. Sultan Al Jaber told an audience in Baku on 26 October that he was determined to take a “business unusual approach” to “close a massive emissions gap” and deliver climate outcomes at COP28.

Speaking just 34 days before the UAE hosts the world for the COP28 global climate summit, Dr. Al Jaber was in Azerbaijan for the inauguration of Masdar’s Garadagh Solar Park. While in Azerbaijan, Masdar, which Dr. Al Jaber chairs, signed agreements for two further solar projects and one onshore wind project with a total capacity of 1GW. This is part of the first phase of a 10GW pipeline of renewable energy projects that Masdar is developing in Azerbaijan.



The inauguration of the Garadagh Solar Park was overseen by President of Azerbaijan, HE Ilham Aliyev. The 230MW Garadagh Solar Park will power more than 110,000 homes and reduce carbon emissions by 200,000 tonnes a year. Addressing the audience, Dr. Al Jaber said, “this event perfectly illustrates the practical action needed to turn the goals of the Paris Agreement into tangible reality.”

Dr. Al Jaber continued, “while investment in renewable energy continues to grow, with a record 500GW added globally this year, the world must triple renewable energy capacity by 2030 to keep 1.5 within reach.”

Addressing the scale of the climate challenge, Dr. Al Jaber said that “Paris unified the world around a common goal, but since then, we have not seen enough action to close a massive emissions gap.”

To deliver on these global targets, Dr. Al Jaber continued, “we need innovative approaches to climate finance to ensure a pipeline of viable projects can be developed and delivered in record time.”

Dr. Al Jaber noted that Garadagh was achieved through a partnership between Masdar and the Abu Dhabi Fund for Development, the Asian Development Bank, the European Bank for Reconstruction and Development and Japan’s International Co-operation Agency.

“This is a great example of multilateral and bilateral institutions coming together from around the world in innovative blended finance to deliver real results, especially across the Global South. This is a catalytic model for project finance that Masdar has developed over nearly two decades to successfully deliver renewable energy projects in over 40 countries,” he said.

Speaking of the importance of investments in grid infrastructure to enable the tripling of global renewable energy capacity, Dr. Al Jaber also noted that “by connecting the electricity grid to Georgia, Hungary and Romania, this country will be a regional exporter of renewable and low carbon energy.”

Concluding his remarks, Dr. Al Jaber spoke of how his Presidency of COP28 would be underpinned by inclusivity and a focus on action.

“I have seen how new technologies combined with strong political will and results-driven private enterprise can make game-changing progress for the climate and our economies,” He said. “And I have learned that it is critical to bring everyone to the table to be part of the solution. This is the spirit of inclusivity I want to bring to COP28. I want to bring the world together to focus on solutions and results. A little less conversation, a lot more action. This is the business unusual approach I am determined to take.”

The four pillars of the COP28 Presidency’s Action Agenda are fast tracking the energy transition, fixing climate finance, focusing on people, lives, and livelihoods, and fostering inclusivity.

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Climate Change and Biodiversity in Africa: protecting nature's wealth for a sustainable future

The Impact of Climate Change on African Biodiversity:

Africa's rich biodiversity is facing an unprecedented challenge as climate change exerts its grip on the continent. The repercussions of climate change on biodiversity are far-reaching, impacting ecosystems and species across Africa. In Egypt, farmers working the land along the Nile River Delta are facing increasing hardship as rising sea levels cover the once fertile soil with sheets of dried salt and consequently their crops deteriorate from one year to the next. The United Nations Intergovernmental Panel on Climate Change has described the Nile Delta as one of the world's three most vulnerable hotspots for climate change impacts, including rising sea levels. There are increasing concerns that this threat might spread if urgent measures are not taken to combat the rising seawater.

The Economic Value of Biodiversity and Ecosystem Services:

Beyond its ecological significance, Africa's biodiversity holds immense economic value through the provision of ecosystem services. Forests contribute to carbon sequestration and function as natural buffers against climate

change impacts, reducing the risk of flooding and soil erosion. Wetlands play a crucial role in water purification and provide habitat for a wide array of species. Agricultural systems rely on pollinators, such as bees, to ensure crop productivity. These ecosystem services, often taken for granted, underpin various economic sectors, including agriculture, tourism and pharmaceuticals. Recognizing the economic value of biodiversity highlights the imperative of preserving and restoring ecosystems to sustain these valuable services for present and future generations.

Preserving Africa's Biodiversity: A Global Imperative

Preserving Africa's biodiversity is a global imperative, given its ecological, economic and cultural significance. Protecting biodiversity is essential for maintaining ecological balance, sustaining livelihoods and ensuring food security. By implementing sustainable practices, promoting conservation efforts and supporting local communities, we can safeguard Africa's unique natural heritage.

As part of its goal to deliver clean energy access in emerging markets, AMEA Power

"As the impacts of climate change threaten Africa's rich biodiversity, it is imperative that we recognize the ecological, economic and cultural significance of preserving nature's wealth. AMEA Power's commitment to biodiversity conservation, demonstrated through their Amunet project, serves as an inspiring example of how businesses can champion sustainability. By embracing a holistic approach that minimizes ecological impacts and integrates biodiversity considerations, we can ensure a sustainable future where Africa's biodiversity thrives, benefiting both nature and humanity".

Vito Saluto





ameapower.com



White stork. Photo © Carlos Delgado; CC-BY-SA

follows this blueprint to select locations that have low biodiversity value, avoid critical habitats or sensitive areas, and incorporate biodiversity-friendly features into the design of our projects. Whenever this primary approach is not feasible, AMEA Power adopts the best practices in the design and operation of our projects to minimise the impact on local ecosystems. These measures encompass reducing noise pollution, minimising land use, using non-toxic materials, implementing effective waste management practices and protecting and restoring natural habitats crucial for the survival of various species.

For instance, in the development of their 500MW Amunet Wind project in Egypt, AMEA Power undertook comprehensive biodiversity studies. These studies included a Critical Habitat Assessment (CHA), a Cumulative Effect Assessment (CEA) and extensive consultations with key project stakeholders, such as the Natural Conservation of Egypt (NCE) and representatives from Birdlife International for Egypt.

The valuable insights gained from these studies enabled AMEA Power to develop a purpose-built Biodiversity Action Plan (BAP) and conduct an offset feasibility study. These initiatives aim to protect the region's wildlife, including both native and exotic bird species that utilize the area as a migrating corridor. The primary focus of these endeavours revolves around minimizing ecological impacts, restoring degraded habitats and seamlessly integrating biodiversity considerations into project operations. Through active engagement with local stakeholders and strategic partnerships with conservation organizations, AMEA Power actively fosters collaboration and knowledge-sharing, ultimately ensuring the long-term preservation of biodiversity within their project areas.

Inspiring Action and Collaboration

Addressing the intertwined challenges of climate change and biodiversity loss requires a collective effort from governments, businesses, communities and individuals. Governments play a pivotal role in creating and enforcing policies that support

biodiversity conservation and climate change mitigation. Businesses have a responsibility to adopt sustainable practices, reduce their ecological footprint and invest in nature-based solutions. Communities can actively participate in conservation initiatives, raising awareness and implementing sustainable practices in their daily lives. It is through collaboration and partnerships that we can achieve greater impact, pooling resources and expertise to tackle these global challenges.

Conclusion

The intertwining of climate change and biodiversity loss calls for urgent and concerted action. Africa's biodiversity is an invaluable treasure, offering ecological resilience, economic benefits and cultural identity. By understanding the impacts of climate change on biodiversity and acknowledging the economic value of ecosystem services, we can drive transformative change. AMEA Power's dedication to biodiversity conservation stands as a shining example, demonstrating how businesses can become champions of sustainability.

LACES Group: pioneering sustainability in the beauty industry

Shifting the spotlight on sustainable energy and water conservation.

Since its establishment in 1987, LACES Group, under the visionary leadership of its founder, Cris Dios, has been unwavering in its commitment to aligning business needs with environmental responsibility. Over its 35-year history, the group has championed a range of Environmental, Social and Governance (ESG) practices, including support for the indigenous communities of Xingu in the Amazon. Today, it stands at the forefront of the clean beauty movement in the Brazilian market, with innovative initiatives like Carbon Limited, a subsidiary specializing in the voluntary carbon market.

What truly sets LACES Group apart is its exceptional focus on sustainable energy practices and water conservation. These two pillars are at the heart of the Group's environmental efforts and play a pivotal role in its quest for economic sustainability.



ENERGY MATRIX AND WATER CONSERVATION

In the hair salons of LACES Group, power efficiency takes centre stage, with a clean energy matrix powered by solar energy and tube lighting, reducing the reliance on traditional bulbs during daylight hours. However, the real gem lies in the water management system. A state-of-the-art water treatment station, utilizing physiochemical processes and reverse osmosis, not only purifies water for hair washing but also enables rainwater harvesting and its reuse for various purposes within the premises. To further enhance water efficiency, the Group employs photo-thermal plates and a smart boiler, capable of holding up to 1,000 litres of water. This commitment to sustainable energy and water practices earned LACES the title of the most sustainable salon in Brazil in 2022.

CARBON COMPENSATION

Since 2014, LACES Group has been actively neutralizing and compensating for greenhouse gas emissions in all its activities, including waste generation, electricity consumption and transportation. In 2021, the group acquired Carbon Limited, a consultancy specializing in the voluntary carbon market, solidifying its commitment to reducing its carbon footprint. As part of this initiative, LACES now extends its carbon-neutral claims to suppliers and staff, setting an industry example by highlighting that traditional salons emit approximately 250kg of CO₂ per chair.

PACKAGING AND PRODUCTS

LACES Group's dedication to sustainability extends to its packaging and product production processes. Since 2008, its factory has been certified as "organic." The group employs reverse logistics to manage product and packaging flow efficiently, utilizing recycled materials and Go Green resin for packaging. This approach guarantees biodegradability within just five years, in stark contrast to the traditional plastics' 200-year lifespan.



LACES

www.lacesandhair.com.br

USE OF ALUMINIUM

Laces Group has made a substantial environmental impact by replacing conventional foils with reusable highlighting tools like Roller Mèches since 2006, thus diverting around 12.5 tons of aluminium waste from the environment. This initiative is especially significant when considering that the city of São Paulo’s 65,000 hair salons dispose 15 tons of foils daily.

In addition to these initiatives, the Group runs a project called BIOMA, aiming to transform conventional salons into sustainable ones by sharing its expertise in sustainable products and business models.

With over 60,000 customers booking annually, LACES Group recognizes itself as a catalyst for local, regional and global change. Its unfaltering commitment to sustainable energy practices and water conservation not only sets a high standard for clean beauty but also significantly contributes to reducing the climate impact in the beauty industry in Brazil and around the world.



Conscious Beauty: sustainability, innovation and diversity

The leading Brazilian Clean Beauty brand shows, since its origin six years ago, that it's possible to offer excellence in high-performance and environmentally-concerned beauty products. Simple Organic demonstrates that the intersection between sustainability, innovation and diversity is crucial in reshaping a more conscious market.

We all know the cosmetics industry is one of the most polluting in the world, because of both the irresponsible disposal of packaging and products formulated with environmentally harmful ingredients. Although complex, transforming this reality with much-needed changes is urgent. And it's essential to show consumers and investors that it's possible.

Our commitment is to sustainable products from the beginning of the production line to the end. We operate within the principles of Green Beauty and Blue Beauty, the latter being all about the oceans, formulas that do not harm marine life, and strict packaging policies for post-consumption.

One year after COP27

Since last year, our list of products, which amounted to more than 80 natural, organic, vegan and cruelty-free products, has increased.

One of our major concerns is the impact of sunscreens on marine life, especially corals. In the last 30 years, 50% of the world's corals have disappeared. Some factors, such as plastic in the oceans and sunscreens containing Oxybenzone and Octinoxate, can alter the coral reef's immune system, contributing to its bleaching.

Therefore, we've launched the Sunscreens Simple Sun and the Skin Stick foundation SPF30 line, both championing Blue Beauty. Our SPF line is formulated free of ingredients like Oxybenzone, Octinoxate, Homosalate, Octocrylene and Avobenzone to protect sea life. We've replaced them with physical filters safe for the human body and the planet, making the formulas "Reef Friendly".

And the purpose of bringing positive impact expanded even more with the launching of Simple Wellness – a line of dietary supplements with certified ingredients and 100% clean formulas.

Embracing SDG 14

With our *Simple + você pelo Oceano* [Simple + you for the Ocean] campaign, we brought the consumer's attention to the Ocean, addressing one critical problem plaguing marine life: fishing nets abandoned in the sea. In only one year, the so-called ghost nets were responsible for the death of 25 whales in Brazil. Research shows that 580 kg of fishing nets, or 81 stones, are left in the sea, impacting 69 thousand marine animals each day.



SIMPLE ORGANIC

simpleorganic.com.br

This initiative sponsors an unprecedented project in Brazil: *Rede contra redes* [Net against (fishing) nets], from our partners Sea Shepherd Brazil. The project includes training with professional divers and underwater cleanup to remove over a ton of fishing nets, just in its first phase.

Initiatives such as this are vital to broadening the protection of various animals that are part of the marine ecosystem and safeguarding life in and out of the Oceans.

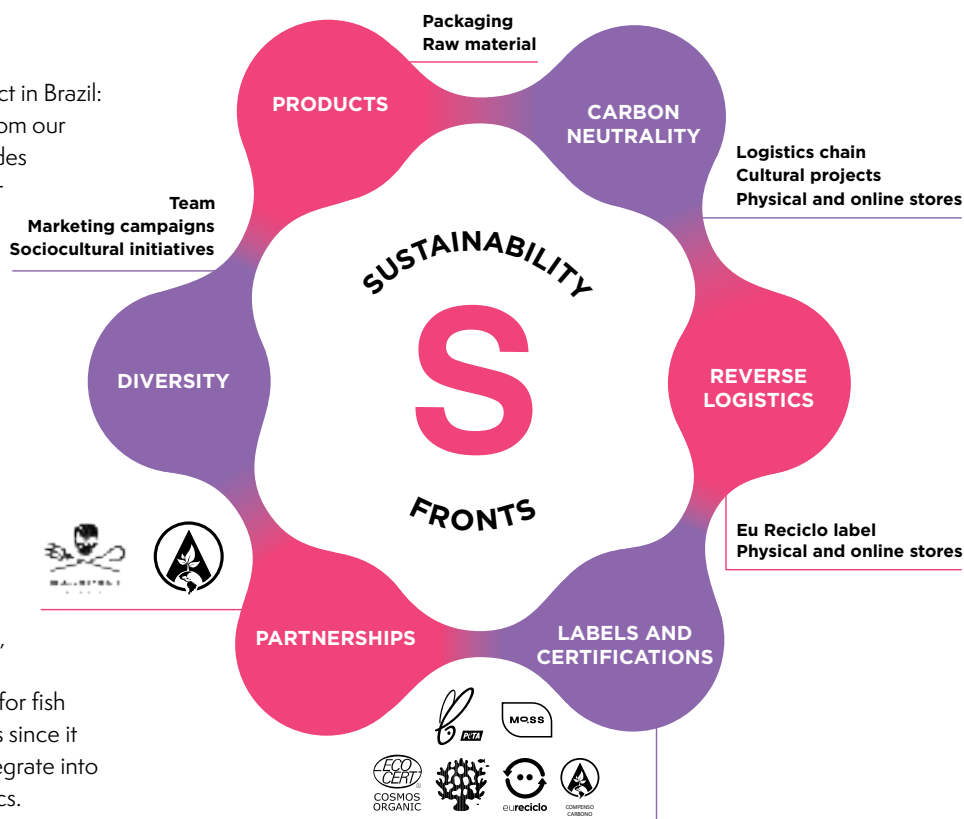
Additionally, our Simple Bag is made with water-soluble ingredients. Once you dissolve it, the liquid residue that arrives at the sewage treatment plant will be consumed by microorganisms. And if the bag eventually reaches the oceans, it will slowly dissolve, becoming safe food for fish and other animals since it doesn't disintegrate into microplastics.

Moreover, our operation with the *Eu Reciclo* [I Recycle] label certifies that we offset 100% of the packaging we put in the market through the work of recycling cooperatives, thus also promoting job creation.

Carbon Neutrality efforts beyond the company

We perform net zero initiatives through regenerative planting in agroforestry regions.

Our partnership with Agroforestry Carbon, apart from neutralizing emissions, supports the practice of regenerative planting and produces a source of income for small agricultural communities.



In May 2023, we also sponsored the carbon offsetting of the largest free music event in Latin America, TIM Music Rio, on the world-famous Copacabana beach. This neutralization was also accomplished by agroforestry regenerative planting.

Likewise, we neutralize the carbon emission from our logistics chain and the operation of our chain of stores. Shoppers can also offset carbon from their packages' shipping on our e-commerce.

As a digitally native brand, Simple Organic's pro-sustainability stance has gained vast ground through its own e-commerce and social media profiles, which add up to 1.5 million engaged followers. The brand is also in 1,500 pharmacies and has the segment's largest franchise network in Brazil.

We believe that individual actions impact the collective future. Everyone must embrace initiatives to preserve the planet, with respect for diversity and a conscious look at sustainability. It's all about making the process as sustainable as possible.

Given all this, Simple Organic is more than a skincare brand; it's a MOVEMENT.

Public policies to boost the energy transition: academic smart solutions to public and private organizations

By Cácia Pimentel and Maria João Rolim

Public policies play a critical role in establishing a stable environment to facilitate the global energy transition. Policymakers can set the direction and pace of the transition by implementing policies that increase in stringency over time, such as emissions offset and trading schemes, carbon taxes, government procurement, awards and subsidies, among other instruments.

Universities and research centers can offer technical assistance, planning resources, customized consulting and training to help public and private organizations achieve energy goals related to local resource reliance, institutional, social and economic resilience, enhanced institutional capacity and lower energy costs.

The Mackenzie Integrity Center for Public Policy is providing support to organizations to achieve a just transition. The Mackenzie Integrity Center is an academic institute in São Paulo, linked to the one of the most acclaimed universities in Brazil. The philosophy behind the Mackenzie Center is to offer the grounds to bring together researchers, public authorities, technical and C-Level representatives of the public and private spheres in an integrity center to analyze Brazilian challenges and prepare proposals that can be implemented in public policies, providing advances for the country.

It is an unprecedented initiative in Brazil that presents legal, scientific and technological action, which encourages the development of research with high academic performance, as well as promoting excellence in consulting and advanced courses for the improvement and proposition of public policies and business guidelines, which ensure integrity in the economic sector.

Integrity translates into the global understanding of a problem, thinking about all the facets involved, whether ethical, scientific, technological, legal, regulatory, economic, socio-environmental and political. This way, the Mackenzie Center works not only upon demand from the public or private initiative, but it identifies the need and acts in the elaboration of proposals to face the problems.

This way, when public policies are offered by national and sub-national governments, the Mackenzie Center contributes by offering in-depth studies with legal tools and regulatory solutions. The responsibility for the great dilemmas faced by the nation also belongs to civil society, including academic centers.

For this reason, the Mackenzie Integrity Center developed, among its program areas, a distinguished energy governance program to study the energy governance in Brazil, such as its comparative advantages and technical and regulatory limitations. The focus is to allow the modernization of the regulatory infrastructure that leverages the energy transition in Brazil, not only with socio-environmental protection, but also with development and economic growth.

Brazil has a large comparative advantage in relation to the rest of the world to reach the global target of decarbonization of at least 80% by 2050. The Brazilian energy matrix is composed of 45% clean energy, while the world average is only 15%. However, the growth in the use of fossil energy sources, diesel subsidies and other policies that promote deforestation and greater emissions of greenhouse gases put at risk the socio-environmental ecosystems, the sustainable economic growth and the goals established by Brazil in multilateral organizations. Energy policies need more precise legal contours that pragmatically lead to the target of sustainable development, by restructuring the production of biofuels and bioelectrification, providing a regulatory structure for CCUS technologies, and taking advantage of the legal framework for innovation, the agricultural sector, the extensive coastline and the diversity of Brazilian biomes.



Dr. Cácia Pimentel (left) and Dr. Maria João Rolim (right)

The modernization of infrastructure and logistics is also a topic studied by the energy governance program at the Mackenzie Center, as it is one of the main bottlenecks in the energy transition. The necessary investments are substantial and require greater constructive collaboration between public authorities and the private sector, including international financing and the participation of multilateral development banks. Studies by the Mackenzie Center indicate the most effective tools to bring security to financial investment flows, including a more competitive business environment and carbon credits as a payback for the investments in a low-carbon economy.

The energy transition needs to be grounded in security pillars and consider the ecosystem's infrastructure and resilience to avoid severe economic dislocations and ensure social and financial support. The energy governance professors and researchers of the Mackenzie Integrity Center are committed to delivering a complete cycle of highly qualified and structuring education and regulatory solutions.

Certification and the race to lead the global hydrogen market: where Brazil stands?

Rolim Goulart Cardoso

www.rolim.com

By Alice Khouri, Vivian Marcondes and Lucas Ribeiro

Climate change's impacts, allied to the increase in world energy demand, imposes an urgent need for technological alternatives compatible with a sustainable pattern of development. The International Renewable Energy Agency (IRENA) has long argued in favour of using hydrogen to achieve full decarbonization¹. However, in order to achieve this, at very least the following strategic steps will have to be taken: raising current production five-fold, with the vast bulk been sustainable hydrogen²; reduction in production costs of renewable power generation; improving technologies, economies of scale and competitive supply chains; and finding the answers on how to develop hydrogen certifications that communicate worldwide.

The scenario launched a race among countries endowed with clean energy resources to be the main hydrogen world-exporters. Brazil has an opportunity to be in a leading position in this race since it is endowed with an abundance of renewable energy sources: solar and wind energy, and also critical natural resources such as rare metals. However, as advantageous Brazil's position is, it will not be sufficient alone, and key supportive policies will be essential to scale hydrogen production, especially those related to hydrogen certification.

The current government has advanced on the regulatory front by further structuring the national strategy and its goals. In 2021, the Brazilian Government published its National Hydrogen Program (PNH2), as well as the Triennial National Plan 2023-2025. In its first version, the plan was targeted with criticism, unlike other countries such as the United States³, United Kingdom⁴, Australia⁵ and Germany⁶, the Brazilian version lacked specific targets and objectives. More recently, though, after a public consultation process, on August 16, this year, the

government updated the triennial plan, assigning three specific goals: (i) disseminating pilot plants by 2025; (ii) consolidate Brazil as the most competitive low-carbon hydrogen producer worldwide by 2030; and (iii) consolidate, by 2035, low-carbon hydrogen hubs.

Under these new developments, strategy-wise, it is clear that the current government is eager to scale the low-carbon hydrogen national market; yet, it must beware of the urgency required to meet net zero pledges and, consequently of the scale that sustainable hydrogen must reach in a short period of time. Certification is crucial to advance this objective and, in this aspect, the Brazilian National Hydrogen Strategy has been silent.

Consistent certification schemes will be crucial to an effective renewable and low-carbon hydrogen market. Harmonizing certification criteria in specific and crucial aspects can facilitate international trade, support global emissions reductions through greater transparency of environmental externalities, and support the competitiveness of markets. On the contrary, incompatible certification requirements create technical barriers to trade, hinder efficiency and lead to deficient interoperability of global markets.

Several countries have already adopted some degree of certification requirements. Germany has adopted TÜV SÜD⁷, the European Union has the CertifHy⁸ and REDII⁹, and California has established the Low Carbon Fuel Standard (LCFS)¹⁰, all of them focusing on the renewable nature of energy, on the life cycle carbon footprint, and additionality.

Brazil needs to quickly position itself in this key aspect, otherwise it risks missing the opportunity of leading this crucial race.



1 IRENA (2022) *World Energy Transitions Outlook*

2 Pursuant to Irena, global hydrogen production must scale to 614 megatonnes per year, to reach 12% of the final energy demand by 2050. IRENA (2022). *World Energy Transitions Outlook*

3 Available at: <https://www.hydrogen.energy.gov/clean-hydrogen-strategy-roadmap.html>

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10 Available at: <https://www2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard>

Moss Forest: Get to know the technology revolutionizing the carbon market

By Cláudia Backes, COO, Moss Earth

On average, the certification and audit of carbon credit projects take two years of analysis. The process is expensive, slow and analogue, requiring manual analysis of dozens of documents. While we wait for the conclusion of the process, more than 3 thousand hectares are deforested daily in the Amazon rainforest, equivalent to 21 trees deforested per second¹. Ignoring this reality is no longer an option. The planet is in a hurry, and this urgency incites us to speed up the process.

Imagine a future where technology and artificial intelligence could help us save years of work and thousands of forest hectares. Now, visualize a scenario where an innovative system can automate all the manual processes and estimate with precision the potential of generating carbon credits in every area of the national territory.

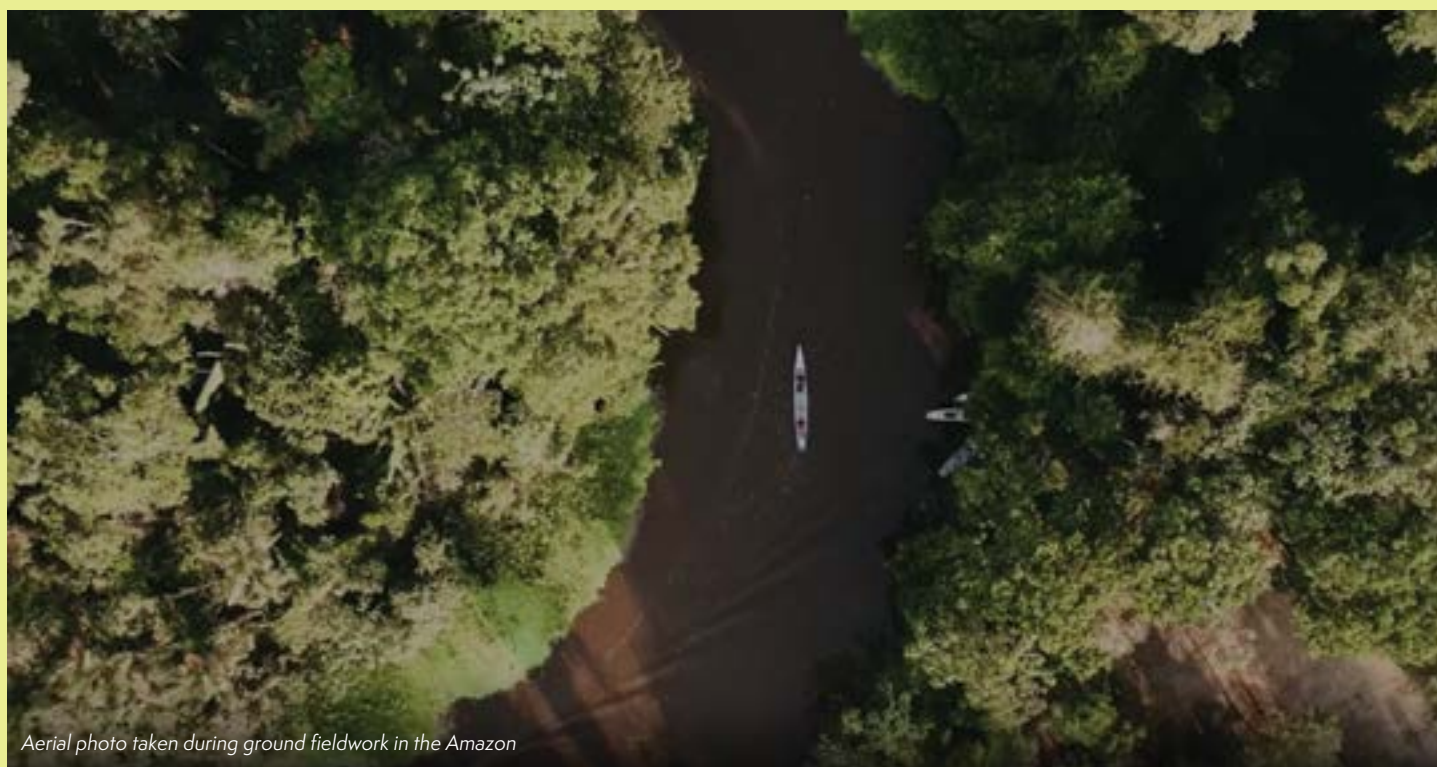
Advocating for a comprehensive approach to environmental stewardship, moving beyond conventional carbon offset methods to also emphasize biodiversity conservation is not a distant idea; it's already a reality.

With a holistic conservation approach, we can conserve our biodiversity and nature while working with restoration tools using tech and digital carbon market tools to originate and distribute carbon credits with the best UX in class.

The future is now, and Moss is leading the movement with Moss Forest – our end-to-end dMRV process automation gives speed to all the stages of project development and drastically reduces the vulnerability of human error.

Get to know 5 attributes of the technology that is revolutionizing the market:

- » **Precision and agility:** Moss Forest is the first solution that estimates the potential of carbon credits generation in the Brazilian territory using big data to integrate into a single data lake² real-time satellite technology, scientific studies and several databases giving us precise results in a few minutes.



Aerial photo taken during ground fieldwork in the Amazon

MOSS

moss.earth

Moss

Based in Brazil, Moss was born in 2020 from the vision and dream of conserving the Amazon rainforest and tackling climate change. They use cutting-edge technology to develop products and automate the entire carbon credit chain, from developing carbon projects to offset emissions. With more than 300 clients, Moss has transacted more than 4 million carbon credits that have helped conserve approximately 650 million trees in the Amazon rainforest.



Local fauna, ground fieldwork in the Amazon

- » **Technology to analyze the areas:** Moss Forest is a dMRV³ system that assesses forest areas with the potential for carbon credits projects using geospatial analysis, remote sensing, artificial intelligence and big data. Our system filters the data, searching for inconsistencies and verifies the integrity of the information.
- » **Machine learning to automate manual processes:** Moss Forest estimates the potential carbon credit generation of each pixel obtained through satellite imagery. The information collected is used to calculate the total amount of carbon credits that an area can generate. It also monitors the region's biodiversity, all of this in minutes!
- » **Project cost reduction:** with Moss Forest, the development of carbon credits origination projects happens way faster, with a more significant amount and less cost. We dramatically reduce the costs of project development.
- » **Fighting the climate crises:** Moss Forest brings the necessary agility to reach the environmental goals established by the UN. With our technology, not only do we accelerate the development of projects, but we also conserve more areas in less time. The impact reverberates positively in the biodiversity and local communities in the Amazon. The synergy between innovation and nature results in actions like a more sustainable planet, connected, facilitates medical access to the heart of the Amazon, reinforces forest surveillance and monitors the animals on the endangered species list. It also contributes directly to four UN Sustainable Development Goals:
 - **2:** Zero Hunger
 - **11:** Sustainable Cities and Communities
 - **13:** Climate Action
 - **15:** Life on land.

That's how technology protects Amazon. And Moss does what the planet needs the most: keeps the forest standing with urgency and precision.

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- 1 Source: Map Biomas
- 2 Data Lake is an approach to storing a large amount of data in a centralized way
- 3 dMRV: Digital Monitoring, Report and Verification

Responsible mining as a strategy for mitigating climate change

By Vinicius Pinho, Talita Galvão and Matheus Stevanin

Brazil's small and medium-scale gold mining: embracing responsibility for a sustainable future.

Challenges in Gold Mining

The global gold market is highly valued for its security, liquidity and high added value. However, illegal ore extraction casts a shadow over this industry, causing environmental, social, climate and economic damages, compromising the sector's sustainability and the value chain responsibility. In Brazil, combating illegal exploitation is a challenge. Illegality results in deforestation, river contamination and other crimes in affected areas, especially in the Amazon region. These challenges have an amplified impact on the process of climate change.

It is important to distinguish between the illegality of legal and responsible mining, which brings numerous social and economic benefits, promoting sustainable development and mitigating climate change. As an organisation committed to sustainability in the gold value chain, Fênix DTVM works to adopt and improve good practices that promote environmental and social responsibility.

Gold Traceability through Blockchain

Certifying the origin of gold is one of the main challenges faced in the value chain, as it is necessary to ensure that the ore has not been illegally extracted, especially from indigenous and protected areas. Considering this issue, Fênix DTVM, in partnership with Minespider, is implementing a project that uses Blockchain technology to trace and monitor the gold traded by its suppliers.

In 2023, this project achieved a significant milestone, resulting in the first sale in Brazil of a gold bar with Blockchain traceability. This initiative aims to highlight the potential of this technology in tracing the origin and destination of gold. The company's goal is to achieve 100% traceability of traded gold by the end of 2023.



Gold concentrate processing process in a small-scale mine in Baixada Cuiabana (top) and (bottom): "Vida que Flui" Project: clean up project on the São Lourenço river near to mining operations in the Pantanal Matogrossense, 100% sponsored by Fênix DTVM.

By committing to traceability, origin certification and rigorous monitoring in environmental, social and climate areas, while actively promoting good practices, we can effectively facilitate the transition of small and medium-scale miners towards legality and responsible mining.

Fênix DTVM is a financial institution authorized by the Central Bank of Brazil. As a key player in acquisition and trading of gold, we have experienced rapid and solid growth driven by innovation and new technologies. Established in 2020, we were born fully committed to integrity, sustainability, governance and compliance.



fenixdtvm.com.br



Aerial view of a gold mine in the supply chain monitored by Blockchain.

Supplier's Enhanced Due Diligence

Fênix DTVM establishes rigorous compliance standards throughout its gold supply chain. For instance, Certimine, an independent company, conducts on-site visits to suppliers and certifies the origin of the gold.

During these visits, Certimine examines multiple criteria, including adherence to authorized areas for gold exploration, a comparison between mining activity and transaction volume, assessment of human rights conditions, compliance with operational licenses and extraction permits, and adherence to environmental regulations.

The objective is to ensure that extraction areas are regenerated through actions such as the recovery of degraded areas, reforestation programs and biodiversity mapping. In this way, the aim is to ensure the legality of gold while mitigating the environmental impacts related to climate change.

Promotion of Good Mining Practices

One of the actions developed was the collaborative agreement signed with an European association that promotes best practices in small and medium-scale gold mining. Following environmental, social and governance criteria established by the association, participating mines can receive a cashback of US\$1 for every gram of gold sold, which must be used to promote social and environmental projects, aiming to generate value for stakeholders.

Non responsible use of mercury in ore processing can pollute rivers and the atmosphere. In order to comply with the National Action Plan for the Elimination of Mercury Use in Gold Mining and adhere to the Minamata Convention, Fênix works together with the Research Center for Responsible Mining at the University of São Paulo (USP), which seeks to identify initiatives to enable the replacement of mercury for

small and medium-scale miners, as well as raise awareness among artisanal miners about the environmental, social and climate benefits.

Commitment to the Future

By committing to traceability, origin certification and rigorous monitoring in environmental, social and climate areas, while actively promoting good practices, we can effectively facilitate the transition of small and medium-scale miners towards legality and responsible mining. This contributes economically to the communities in which they operate and represents a direct and real contribution to combating climate change in accordance with SDG 13 (Climate Action). Together, we can take on this challenge, generating jobs, preserving the environment, protecting communities and contributing to an increasingly sustainable future.

Implementation of climate policies: how can geotechnology and data assist?

The Codex team works to facilitate and optimize the clients decision making processes in the public and private sectors, in order to guarantee security and efficiency. Our main areas of operation are: Environmental Monitoring, Data Drive Public Policies, Spatial Data Infrastructure and Digital Government.

In Environmental Monitoring, with the use of high resolution satellite images, it is possible to map change detections in land cover without the need of fieldwork. The solution developed by Codex in collaboration with the Institute of Environment of Mato Grosso do Sul (IMASUL) enables teams to manage and monitor alerts for wildfires and deforestation using georeferenced data and high-resolution satellite imagery, thereby generating environmental reports on the platform that assist in territorial oversight and environmental preservation. The solution presented at COP27 has become an international reference in environmental deforestation monitoring. As the state of Mato Grosso do Sul takes a significant step towards controlling and combating deforestation and wildfires, it also promotes

more efficient and sustainable natural resource management.

With reference to geospatial technologies, we work in the creation and implementation of systems that allow integration, access, sharing and dissemination of data. The Geospatial Analysis and Environmental Information Monitoring Platform – PAMGIA centralizes and dynamically integrates environmental information from IBAMA (The Brazilian Institute of the Environment and Renewable Natural Resources), allowing data to be viewed statistically and geospatially by users. This aims to improve access, control, management and availability of environmental information. The platform's main outcomes include real-time monitoring of enforcement operations against deforestation and forest fires using

geotechnologies and artificial intelligence, thus acting predictively to curb environmental violations. The institute has enhanced transparency of environmental information and services to society and integrated various systems within the institution to enable integrated consumption of geographic information. The integration carried out by IBAMA assists in the unification of national information by the Brazilian state, so that local institutions can access data that comes from the largest Brazilian environmental institute.

In addition, we are developing an international Geospatial Intelligence Hub at Suriname, financed by the IDB, one of its objectives is to establish Data Governance so that public policies can be coordinated through effective and accurate





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information to assist in public strategies aimed at mitigating environmental impacts. Data from various institutions will be structured with the goal of having a standardized format that can be aggregated into a massive database. Roles for data governance stakeholders will be created, as well as the project's structure, to ensure its continuity over the years and its evolution based on the country's needs and reality.

When we explain Data Driven Public Policies, we are a tool of implementation of public policies. Our products helps governments to improve their work with data. The use of Big Data and Data Science are effective in the actions against climate change; specialized applications and databases are being developed to combat deforestation and climate change, as well as assist wildfire control at the national level. The main goal of Codex is the implementation of tools for an effective climate agenda that can assist social dynamics in a way that information derived from data is effective in shaping environmental public policies.



Codex is a corporation that operates in the geotechnology, utilities and environment fields, with solutions regarding digital transformation for sustainable development. Codex is part of Imagem Group, ESRI's official distributor in Brazil, developing solutions with ArcGIS platform integrating with MAXAR's high resolution satellite imagery. Our projects actively contribute to the achievement of the 17 Sustainable Development Goals with more than 180 projects in the last 3 years.



Vale: improving lives and transforming the future

Decarbonizing the industry is Vale's commitment to society and the planet.

Vale is among the leaders in the supply of essential products for the development of global production chains and is focused on the practice of sustainable mining, with low-carbon solutions and a focus on disciplined capital allocation.

Vale's climate change strategy reflects the strategic pillar of promoting low-carbon solutions. The company has set ambitious targets: to reduce Scopes 1 and 2 absolute greenhouse gas (GHG) emissions by 33% by 2030 and to reach net zero by 2050 for direct emissions (scope 1) and indirect emissions associated to electricity consumption (scope 2).

Vale is also committed to reducing Scope 3 net emissions by 15% by 2035, which represents more than 80 million tonnes of CO₂e, the equivalent to New Zealand's emissions. To reach Scope 3 target, Vale relies on a high-quality portfolio and innovative technology to provide solutions to decarbonize the value chain; partnership and engagement with clients and suppliers; and the limited use of high-integrity carbon credits.

One of the measures adopted in this decarbonization journey is the replacement of fossil fuel with cleaner alternatives. The technological route to achieve net zero GHG emissions involves a set of fuel solutions

such as ethanol, biodiesel and ammonia. Means of transport's electrification enters this composition as an auxiliary strategy.

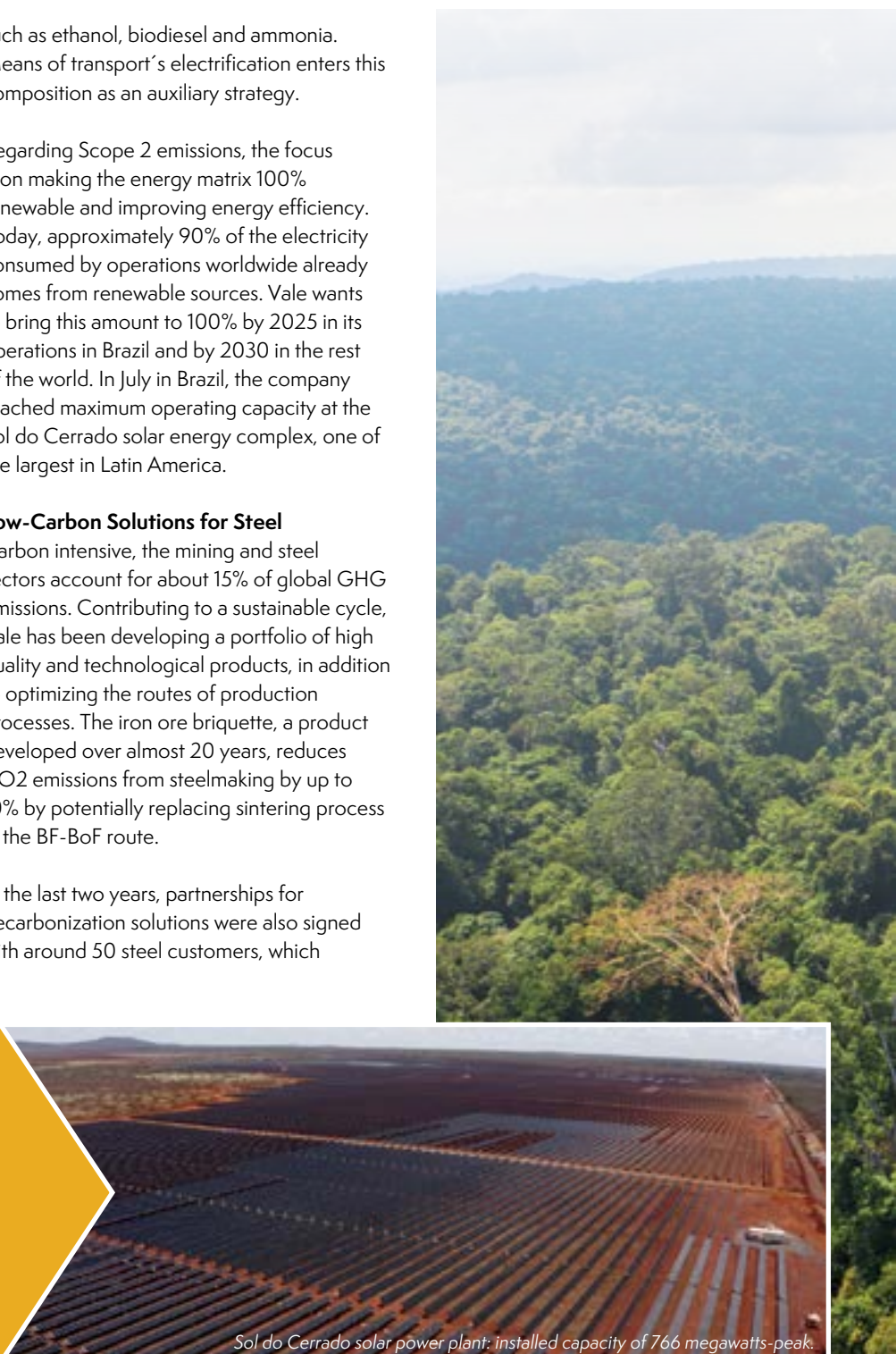
Regarding Scope 2 emissions, the focus is on making the energy matrix 100% renewable and improving energy efficiency. Today, approximately 90% of the electricity consumed by operations worldwide already comes from renewable sources. Vale wants to bring this amount to 100% by 2025 in its operations in Brazil and by 2030 in the rest of the world. In July in Brazil, the company reached maximum operating capacity at the Sol do Cerrado solar energy complex, one of the largest in Latin America.

Low-Carbon Solutions for Steel

Carbon intensive, the mining and steel sectors account for about 15% of global GHG emissions. Contributing to a sustainable cycle, Vale has been developing a portfolio of high quality and technological products, in addition to optimizing the routes of production processes. The iron ore briquette, a product developed over almost 20 years, reduces CO₂ emissions from steelmaking by up to 10% by potentially replacing sintering process in the BF-BoF route.

In the last two years, partnerships for decarbonization solutions were also signed with around 50 steel customers, which

In July in Brazil, the company reached maximum operating capacity at the Sol do Cerrado solar energy complex, one of the largest in Latin America



Sol do Cerrado solar power plant: installed capacity of 766 megawatts-peak.

Vale

Vale is one of the world's largest producers of iron ore and nickel and a major copper producer, headquartered in Brazil and operates around the world. Its operations comprise integrated logistics systems, including approximately 2,000 kilometres of railways, marine terminals and 10 ports distributed around the globe.



www.vale.com

represent about 35% of Vale's scope 3 emissions. Agreements were also reached with Saudi Arabia, the United Arab Emirates and the Sultanate of Oman to create mega hubs for the production of hot briquetted iron (HBI) and high-quality steel products using iron ore briquettes.

A Standalone Company to Scale Energy Transition Metals

Vale Base Metals has secured agreements to supply low carbon and high purity nickel to major automakers and is strategically focused on expanding mine of life and development of growth project across the portfolio.

Uniquely positioned to deliver into the unprecedented demand for nickel and copper

as the world transitions to a low-carbon future, Vale reached two separate agreements to sell 13% stake in its base metals business, aiming to boost nickel and copper production to 300,000 and 900,000 metric tons per year, respectively.

Socio-Environmental Commitment: Protecting the Amazon

Vale has been present in the Amazon for almost 40 years. The Vale Technological Institute - Sustainable Development (ITV) has already mapped 12,000 genetic references of biodiversity in the Amazon biome, in addition to sequencing 50 genomes of plants and animals.

Carajás National Forest/Vale's protected conservation unit. Photo © RicardoTeles.

Les Eaux Minérales d'Oulmès unveils a comprehensive low carbon and energy transition roadmap



Miriam Bensalah-Chaqroun
Vice-Chairwoman and CEO
Les Eaux Minérales d'Oulmès

“ *Climate change is a pressing challenge of our time, and as a responsible company, we have a duty to take decisive actions. Our Climate Plan reflects our unwavering commitment to sustainability, emphasizing energy transition and digitalization. Through these initiatives, we aim to drive positive change in our industry and contribute to a more sustainable future.* ”

Miriam Bensalah-Chaqroun

Les Eaux Minérales d'Oulmès proudly announces an ambitious Climate Plan to address climate change challenges and promote sustainability.

Les Eaux Minérales d'Oulmès, a leading Moroccan beverage company since 1933, is a member of the UN Global Compact, and has been championing sustainable practices in the industry.

Aligned with the Science-Based Targets initiative (SBTi) guidelines, Les Eaux Minérales d'Oulmès Climate Plan will result in the reduction of greenhouse gas emissions and the transition to a low-carbon economy. Les Eaux Minérales d'Oulmès has committed to setting science-based targets, in line with the Paris Agreement goals of limiting global temperature rise above pre-industrial levels to 1.5°C. These targets will be subject to an independent verification and a regular reporting for transparency and accountability.

With a focus on energy transition, digitalization, renewable energy integration

and packaging optimization, Les Eaux Minérales d'Oulmès aims at making substantial contributions to global sustainability goals throughout its operations, supply chain and the industry.

Les Eaux Minérales d'Oulmès' low carbon roadmap consists of five major pillars around which the company addresses climate issues and its strategy for GHG mitigation.

- 1** ▶ Accelerating the energy transition to clean energy by implementing energy efficiency measures, exploring renewable energy sources and investing in innovative technologies to reduce the carbon footprint.
- 2** ▶ Unleashing the transformative power of digitalization in order to optimize operations, enhance energy efficiency



www.oulmes.ma

and minimize resource consumption by leveraging advanced technologies, data analytics and artificial intelligence.

- 3 ▶ Integrating Renewable Energy: Les Eaux Minérales d'Oulmès aims to increase the share of renewable sources, including sourcing renewable electricity, investing in on-site renewable energy generation and exploring partnerships with renewable energy providers.
- 4 ▶ Packaging optimization is a central commitment, towards which Les Eaux Minérales d'Oulmès takes a holistic approach, focusing on reducing greenhouse gas emissions while maintaining product quality and safety. This involves introducing sustainable packaging materials and incorporating low and recycled packaging options through R&D efforts.
- 5 ▶ Last but not least, we engage our supply chain and encourage suppliers to adopt sustainable practices and technologies, reduce emissions and embrace green energy solutions. By investing in and promoting sustainability, Les Eaux Minérales d'Oulmès seeks to create a more sustainable and resilient transportation system.

Les Eaux Minérales d'Oulmès Low Carbon Roadmap represents a significant step towards a greener future, demonstrating the company's commitment to aligning its practices with climate science and global sustainability goals.

By embracing renewable energy, digitalization and ambitious emissions reduction targets, Les Eaux Minérales d'Oulmès paves the way for a more sustainable future in the Moroccan beverage industry.



Les Eaux Minérales d'Oulmès is the proud winner of the "Digital Demand Driven Electricity Network" (3DN) projects pitch by the International Energy Agency & The UN Environment Program.

The objective of the initiative is to accelerate the path to energy transition to fight climate change through the digitalization of the energy systems and the industrial performance.

Les Eaux Minérales d'Oulmès

Les Eaux Minérales d'Oulmès, subsidiary of the Holmarcom Group, is the leader of the water bottling industry in Morocco, while also operating in sub-Saharan Africa. It is listed on the Casablanca Stock Exchange since 1943 and generated a turnover of 220M\$ in 2022. The company is dedicated to healthy hydration and refreshment through its emblematic brands of still and sparkling mineral waters.

Les Eaux Minérales d'Oulmès has been continuously innovating to offer superior quality products according to strict international standards. The group is committed to driving a sustainable and responsible growth and reducing its environmental footprint. Les Eaux Minérales d'Oulmès is a member of the United Nations "Global Compact" and reports each year on the progress made in terms of contributing to the global objectives of sustainable development.

A port in the Atlantic Rainforest



Navigating through the seas of sustainable logistics is our direction.

The Ports of Paraná are located in the middle of a very important and well protected biome, known as the Atlantic Rainforest, found to the east of the state of Paraná, bordering the Atlantic Ocean. This biome has a huge natural richness and wide biodiversity that covers the largest part of the Brazilian coastline. That means we are within the Mata Atlântica Biosphere Reserve, recognised by UNESCO. More specifically, the Ports of Paraná are part of the Paranaguá Estuarine Complex, one of the largest estuaries in Brazil.

Given its position in such an important ecosystem and the effects that human activity can have on its surroundings, the Ports of Paraná works hard to minimize the most negative effects that port activities have on the environment. Their main objective is the sustainable development of the state's coast, taking into consideration the conservation of biodiversity and regional culture, trying to act according to the 17 United Nations millennium objectives.

The Ports of Paraná are the best port in Brazil, among the large public ports, in terms of environmental performance, this title was bestowed by the Brazilian Waterway Transportation Agency, given its concern and effective actions to reconcile economic development and environmental issues.

The Ports of Paraná currently develop more than 40 environmental programmes focusing on environmental monitoring, education and conservation. Among the programmes developed are the frequent monitoring of the physical and biotic environments, reaching up to 600 km² within the Paranaguá Estuarine Complex. The programmes of the physical environment include the monitoring of water quality, sediments, atmospheric emissions, terrestrial and underwater noise, plankton, benthos, ichthyofauna, birds, cetaceans and turtles, among others.

In addition to this, the Ports of Paraná develop educational programmes with the local communities involving training and workshops, such as permaculture classes, that focus on improving the environmental quality and life of the population of the surrounding islands, using bio-construction techniques such as alternative sewage treatment systems through wetlands and hyperadobe, to name a few. In addition, the Ports of Paraná are investing in rural infrastructure through the construction of small public piers in 14 island communities. In the training programmes, the Ports of Paraná have the Degraded Areas Recovery Plan of the watersheds that flow into the Paranaguá Estuarine Complex. This involves the recovery of agricultural environments around the bay, especially those located in areas of permanent preservation, through the use of Agroforestry Systems that use native plant species of commercial interest to the population.



APPA

The Ports of Paraná are a port complex, composed of the ports of Paranaguá and Antonina. Strategically located in Brazil's southern region, the port terminals have the capacity to handle all types of cargo (grain, container, fluids) and can receive up to 24 ships at the same time, with static capacity of 4 million tons of grain.



www.portosdoparana.pr.gov.br

With these actions, the Ports of Paraná seek not only to encourage the recovery of degraded areas, but to do so in a sustainable manner that brings biodiversity to the region as well as food sovereignty for the most vulnerable populations. These actions focus on food and native species with recognised economic value. In addition, this plan aims to reduce the erosion of river banks and, consequently, the sedimentation of navigation channels, thus reducing the need for dredging events.

Considering its economic importance to South America, the enterprise has projects to expand their port capacity in a sustainable way, by building new piers with modern systems that aim for greater process efficiency. Apart from economic and environmental performance, the Ports of Paraná aim to support the social development of the state's coast, seeking integration and balance between communities, environment, culture and economy, with the entire port process.



Banking on the Climate Transition: our journey towards Net Zero

Luciana Nicola, Sustainability Director, Itaú Unibanco

Climate transition is a major opportunity to rethink the 21st-century economic model. By limiting global warming to 1.5°C by the end of the century, we can create a more sustainable and resilient economy for all. Financial institutions are major allies in this transition, by providing the capital and expertise that businesses need to decarbonize.

Itaú Unibanco is the largest bank in Latin America and a pioneer in the sustainability agenda. We have always supported our clients and their challenges; now we aim to be a climate transition bank for our clients and achieve net zero emissions by 2050.

WHAT MAKES A CLIMATE TRANSITION BANK?

Net zero commitments aligned with high integrity standards: making a commitment to achieve net zero emissions is a first but crucial step to internalize climate change within the strategy. It provides the foundation for climate action and points to the level of ambition. We are members of the Net Zero Banking Alliance and the Principles for Responsible

Banking, partnering with the financial industry worldwide to overcome climate challenges.

Engagement with key stakeholders:

stakeholder engagement is essential for effective climate action. We collaborate with our clients, suppliers, peers, government and other stakeholders, to scale up the transition and discuss priorities. Through engagement an organization can ensure every point of view is considered, enables prioritization and allows translating ambitions into practice.

Implementation of the climate transition

strategy: the first step to implementation is setting climate targets aligned to climate scenarios that limit global warming to 1.5°C

with no overshoot, or limited overshoot.

Considering the transition creates opportunities, products and services that enable sustainable finance to be developed and scaled. We set up a target to distribute BRL 400 billion to positive impact sectors by 2025 and we have already allocated 66% of this amount. Positive impact sectors are those which contribute to the climate transition, the safeguarding of the environment, or have a positive impact on society.

Innovative solutions are necessary: many solutions to decarbonize are not widely available yet. Solutions must be developed and scaled up. We created Cubo ESG, a hub focused on supporting the development




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of innovative solutions for ESG and net zero challenges. The hub consists of 34 startups that are helping transform the climate landscape in Brazil and have engaged more than 100 companies and 1,000 ESG professionals on climate discussions. We are partnering with the academy to understand what must be done to achieve global climate ambitions.

Advocacy with regulators and the government:

not all of the solutions will come from the private sector and public policies will support the transition. We are engaged in advocacy initiatives to support the development of a regulated carbon market in Brazil that will promote decarbonization in key sectors with positive outcomes for the whole economy and society.

Our challenges and pathway ahead

Despite all the progress, some challenges are still on the climate agenda. These challenges are related to the regulatory environment, stakeholder engagement, distinct levels of client maturity, standardization of methodologies and calculators, lack of structured and available data, risk management and adequate transparency of climate information.

Brazil is already advancing on developing the regulatory agenda to scale up the climate transition agenda with the implementation of a regulated carbon market and the development of an Ecologic Transition Plan.

As a financial institution, engaging different stakeholders on the agenda is still a challenge and we understand this is a cross-cutting challenge for the private sector to ensure that the interests of different players are combined, without affecting the climate ambition.

Innovation will play a leading role in climate transition and disruptive technologies need to be scaled up. Organizations committed to the climate agenda have the challenge to name key priorities and the mechanisms to ensure they are adequately scaled up, balancing risks and opportunities.



Itaú Unibanco

We are the largest Brazilian private bank by market value, and the most valuable brand in Latin America, valued at US\$8.7 billion, according to Brand Finance's 2023 Global 500 Ranking. With a vast array of sector-specific products in Brazil, as well as through our brands and business partnerships, we offer a wide range of services across several channels, making us a full-service, universal bank.

Guardians of Mexico's natural treasures: three inspiring stories of environmental restoration

In a world faced with daunting global challenges, where the balance of our environment teeters on a precipice, there emerges a beacon of hope – a triumvirate of organizations joining forces to mend what has been broken. Ríos Tarango, Prontal and the Instituto Mexicano para la Justicia (IMJUS) have fused their collective wisdom and boundless passion to create a new champion: Red 360+1. This is not just another initiative, but a harmonious symphony of minds dedicated to rejuvenating Mexico's fragile ecosystems through a tapestry of high-impact projects.

Within the heart of this collaborative effort lie stories that breathe life into the mission. Stories that resonate with humanity's deepest yearning to protect and restore the natural world. Here are three remarkable tales from the heart of Red 360+1, showcasing best practices that can be woven into the fabric of Mexico's rich landscape.

Mexico, with its vast and diverse landscape, holds the potential for stories like these to bloom across its horizons. The challenge

ahead is to steer local efforts towards green markets, to craft programs that rescue, preserve and harmoniously utilize Mexico's urban and rural ecosystems. Red 360+1 stands as the storyteller, weaving tales of hope and resilience, of a nation coming together to safeguard its natural treasures. These are not just stories; they are a call to action, an invitation to join the symphony of guardians and become part of Mexico's environmental restoration narrative.



Red 360+1°
AGENCIA PARA EL DESARROLLO

360+1 epitomizes a multidisciplinary network that provides sophisticated solutions to harness the opportunities within Mexico amid the global post-COVID landscape.

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1

RÍOS TARANGO: A SYMPHONY OF RESILIENCE IN MEXICO CITY'S HEART

In the bustling heart of Mexico City, Grupo Ectagono and the Ríos Tarango Civil Association have been crafting a vision of urban renewal intertwined with social transformation. Picture the Barranca de Tarango, a once-neglected ravine within the Valley of Mexico basin, now a testament to nature's resilience. Over eight years of toil and devotion, a unique strategy was born – a vision rooted in holistic basin-centric thinking. What started in the Barranca soon spread its wings, reaching the urban ecosystems of Xochimilco, a haven of biodiversity within the chinampa region ('floating gardens'). This approach doesn't just tackle one problem; it embraces a vision that addresses water stress, climate change, air quality and public health, all in one breath. The story of Tarango is a testament to the power of persistence and the potential for renewal.



Ectagono stands as a strategic consultancy, with a specialized focus on corporate sustainable development. We gauge, formulate and execute solutions and projects dedicated to the welfare of both individuals and the planet.

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Instituto Mexicano para la Justicia (IMJUS) stands as a distinguished civil society organization dedicated to fostering critical awareness, thus paving the way for novel regulations and endeavours aimed at fortifying Mexico's Rule of Law.

Web: imjus.org.mx
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Twitter: @IMJUS_AC



2 PRONTAL'S JUNGLE SYMPHONY: PROTECTING JAGUARS AND FORGING HARMONY



Nestled in the heart of Palizada, Campeche, Prontal unfolds a story of guardianship and coexistence. Their journey began in 2021, when they declared the "San Jeronimito" area as a Voluntarily Designated Conservation Area. Here, hidden among the dense jungle, camera traps silently watch over jaguars, symbols of untamed wilderness. In a harmonious partnership with the Animal Karma Foundation, they erected an electric fence – a shield against predators, safeguarding both man and beast. The annual "Conservation Forum for the Jaguar," is a gathering that brings locals and ranchers together to learn the art of coexistence. Prontal's story transcends boundaries; it delves into the world of litigation, aiming to protect the rich flora and fauna. San Jeronimito dreams of the "Palizada Biological Corridor," uniting the community in a sustainable dance of eco-friendly activities. This is a story of unity, resilience and the jaguars that grace Mexico's jungles.



Prontal is a family-owned company that manages a ranch transitioning from livestock farming to reforestation and biodiversity conservation. The ranch is in the process of being certified as a voluntary natural reserve.

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3 AGUAS BUENAS: A RIVER'S SONG OF RESTORATION

In Guanajuato State, a unique project called Aguas Buenas weaves a tale of balance and nourishment. Here, a river irrigates two lands, nurturing not just the soil but also the souls of the local community. Native plants, like characters in a play, take centre stage. They offer sustenance and shelter to the indigenous fauna and become a source of sustenance for the community. This isn't just about planting; it's about creating harmony. River water quenches the thirst of native plants, while soil, flora and water conservation measures protect their legacy. A replicable model for the region, where nature and man waltz in harmony. Aguas Buenas sings a river's song of restoration, where every note nurtures life.



The Circular Economy as it is meant to be

Despite rising food insecurity and pollution, it is shocking that we are still sending food to landfills. Millions of tons of food waste that end up in landfill could be returned to the soil as nutrient rich compost and enable regeneration of soil, thus achieving a circular economy. Soil regeneration is important, especially in a region, such as the Middle East. Increasing circularity in the UAE is absolutely a possibility. The region aims to be the best in everything it does. With the framework and legislation in place, we have all the requirements there is to achieve this.

From waste food to compost in 24 hours

Most of the waste in the GCC region is, indeed, organic waste. The Food and Fast-Moving Consumer Goods industry in particular, creates massive amounts of waste. What we don't realize is that more than 30% percent comes from unsold, expired, damaged or mis-produced products. 50-70% percent of that ends up in landfills without ever being used. No company wants to be associated with landfills and waste.

This is where Ehfaaz comes in. As a circular economy start-up committed to closed-loop recycling, Ehfaaz re-purposes consumer goods waste by converting it into useful materials for other industries. For example, food waste is transformed to organic compost and leftover shampoo and bodywash into car cleaning products. This way Ehfaaz diverts waste from landfills, reduces pollution and creates new business opportunities. Since 2018, over 9 million kilograms of waste has been successfully diverted away from Dubai landfills, reducing 29 million kilograms of CO₂e.

Industrial cleaning products made entirely from recycled waste

To accelerate the transition towards a more circular economy, Ehfaaz consolidated its multiple solutions into the Recycled Products Company (ReProCo). Ehfaaz believes that ReProCo will not only be a breakthrough in the recycling industry but will also encourage companies to recycle more responsibly. ReProCo initially supplies the market with car wash, surface disinfectants and compost made entirely from waste that would otherwise have gone to landfills. Ehfaaz showcased its first commercial

scale ReProCo products in November during the 2022 Gulfood Manufacturing event in Dubai. They also displayed compost made entirely from packaged foods that can be found in any household refrigerator, car wash made from consumer shampoos and conditioners and surface disinfectant made from common body splash and perfumes, which can kill 99% of germs. It aims to continuously provide top quality recycled materials to consumers while promoting a positive feeling of using recycled materials.



Sustainovation shows the path to sustainability

Up to 80% of the emissions associated with end-of-life products comes from the FMCG sector. However, there is a lack of clear reporting standards for end-of-life emissions, making it difficult for FMCG companies to track their progress and identify opportunities for improvement. In response, Ehfaaz developed an End-of-Life Emissions Impact Report that fills this reporting gap. The report provides a comprehensive assessment of the environmental impact of end-of-life products across 23 waste streams in the FMCG industry. The report also identifies emission hotspots and opportunities for emissions reduction. To drive the reporting, Ehfaaz launched the Sustainovation Platform in June 2023. It is a private sector platform for FMCG companies to collaborate and share ideas on sustainability. The platform provides a forum for companies to learn from each other, share best practices and develop joint initiatives.

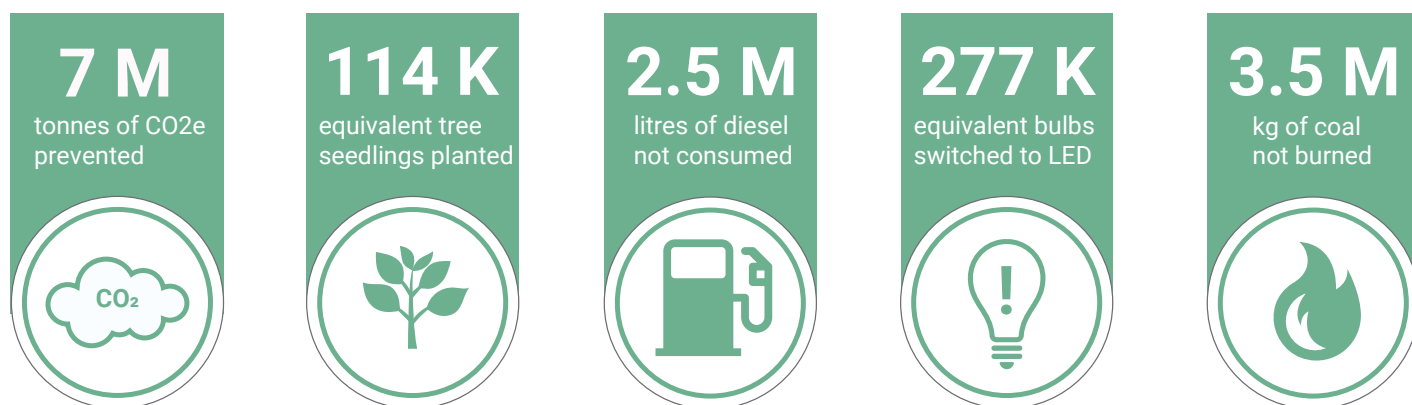

www.ehfaaz.ae

The report, together with the platform, comes at a time when the field of sustainability reporting has witnessed significant growth in recent years, with numerous frameworks and standards emerging to guide companies in disclosing their ESG information. However, despite the progress made in reporting standards and reporting tools, reporting on end-of-life product treatment has become something of an Achilles heel. While the current reporting frameworks available provide valuable insights into a company's sustainability performance, none of them specifically and effectively address end-of-life product treatment and its associated emissions. They are often overlooked or not given enough focus as a result of the limited clarity in how to do the reporting. The irony, though, is that corporations may not effectively achieve their emissions targets without addressing this elephant in the room. Incorporating end-of-life product treatment into corporate reporting frameworks will provide a holistic understanding of a company's environmental impact, drive circular economy practices, foster collaboration and earn consumer trust. Closing this reporting gap is an essential step towards a more sustainable future, where FMCG companies actively contribute to global efforts to combat climate change. This landmark venture marks a pivotal shift towards holistic sustainability reporting. By addressing the void in end-of-life emissions data, Ehfaaz lays the groundwork for a circular economy ethos. By embracing transparent reporting and fostering collaboration, the initiative charts a course toward a more sustainable future, where FMCG companies lead the charge in combating climate change.

Ehfaaz

Ehfaaz is a circular economy start-up committed to closed-loop recycling. We are on a mission to give used resources a new life by using food and Fast-Moving Consumer Goods (FMCG) waste to produce organic compost and cleaning products. Ehfaaz is committed to modernizing recycling and waste management methods to advance the UN's Sustainable Development Goals (SDGs) for a more sustainable world. Ehfaaz is now a leader in providing the UAE with a viable economical, innovative, and sustainable alternative to land filling or incineration. We continuously aim to create a circular economy that promotes the efficient use of resources and encourages the recycling of materials at a high enough quality to create new products. We partner with businesses to ensure that we support them meet their sustainability goals all while adding value to other industries and protecting our planet.

ENVIRONMENTAL IMPACT REPORT



Compliant UN SDG's



Small companies, big steps to fight climate change

By Priscilla Zacharias, CEO of Trevo Recycling

How small and medium sized companies may adopt strategies to add up to large results in the fight against climate change – and in the development of their own results.

Climate change and environmental concerns have been remodelling the global business scenario, bringing to light the need for more conscious and responsible practices. Although large companies have often been the focus of ESG (Environmental, Social, Governance) discussions, it is key to acknowledge the role of small and medium-sized companies (*Pequenas e Médias Empresas* – PME) in the transition to a more sustainable future.

In this constantly evolving scenario, even though PMEs have limited resources in comparison to large companies, they may adopt creative and innovative approaches

while incorporating ESG principles into their culture and business strategies, which results, internally, in cost reduction, operational efficiency, and improved productivity and, externally, leads to the attraction of ethical investors, loyal customers and competitive advantages in their markets.

In Brazil, *Trevo Reciclagem* (Trevo Recycling) is an example that a medium size company may perform a meaningful role in the building of a sustainable future. As a signatory to the United Nations (UN) Global Compact, the company is committed to principles beyond profit that involve environmental, social and

governance dimensions, not only embracing responsibility for reducing environmental impact but also taking on the responsibility of promoting fair and inclusive practices in all of its operations.

While the individual contribution of a medium-sized Brazilian company may seem small in the face of the unprecedented scale of climate change, the real achievement resides in its pioneering action and in the combined impact of the contribution of similar companies. By leading by example and promoting relevant discussions on the topic, Trevo Recycling not only revitalizes the



Trevo Recycling

Trevo Recycling is a Brazilian recycling company that deals with post-consumption and post-industry solid waste.

Its mission is to foster sustainability in all its fronts, while implementing ESG strategies.



trevoreciclagem.com.br

recycling industry, but also sends a global message about the importance of a wide-ranging and inclusive approach to climate change fighting.

Each step towards sustainability – no matter how large it is – contributes to a collective movement toward a more conscious and prosperous future.

“ Our journey is not about us only, but about inspiring other small and medium size companies to follow the same path. We firmly believe that transformation starts at home and, by adopting ESG practices, we can positively influence our value chain and our community. By sharing our successes and challenges, we hope other companies realize that the adoption of ESG strategies is not only possible but also a competition differential and a sustainable growth driver.

Priscilla Zacharias, CEO Trevo Recycling – Brazil

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Green Technology: IT's Critical Role in Global Sustainability

The Digital Revolution and the Decarbonization Challenge: How the IT Sector is Reinventing Strategies for Sustainable IT.

The fight against global warming will be marked in the history of Humanity as the longest of the battles experienced by our civilization. A threat that began silently, as a reflection of an Industrial Revolution (1850) without any environmental concern, has become consolidated in the way consumption has been established in our society, and today, makes eloquent – and increasingly frequent – demonstrations of its power in destabilizing the planet's climatic balance.

Due to greenhouse gas (GHG) emissions, Earth's temperature is 1.1°C above pre-industrial levels. The last decade was the hottest in 125,000 years. CO₂ concentration is unprecedented in two million years. The sea is also more acidic, hotter and with an accelerating rising level. Glaciers have shrunk like never before in the last two thousand years. Arctic ice is the smallest since the year 1000. According to researchers from the Intergovernmental Panel on Climate Change (IPCC), in the Sixth Assessment Report (AR6), published in March, all this context is related to human activities.¹

Under the current warming level, extreme weather events that occurred every 10 years have become more intense and frequent. We just have to look at the heatwaves that hit the Northern Hemisphere last July – considered by scientists from the U.N. World Meteorological Organization (WMO) and Copernicus Climate Change Service, as the hottest in 120,000 years.² In California, United States, the temperature reached 54°C³; in northern China, 52.2°C⁴ and 47°C in Greece.⁵

The scenario – discussed at the United Nations Climate Change Conference (COP 28) in Dubai (UAE) – has contributed to jeopardizing food security in the most vulnerable countries, destabilizing economies and deepening poverty indicators worldwide.

DECARBONIZATION AND CIRCULARITY

In the campaign to reduce carbon emissions and mitigate the impact of climate change, two fronts are defined: the urgent decarbonization of the global economy, focusing on the adoption of renewable

energy; and the change in the relationship between production and consumption – from the linear to the circular model.

According to a study by the Ellen MacArthur Foundation, full use of clean energy sources will account for 55% of GHG emission reductions. The remaining 45% should be obtained by altering the current economic modelling.⁶

As an ally in this theatre of operations, **information technology** has been presenting fundamental solutions to optimize processes and the more rational and efficient use of physical and natural resources so that companies and organizations intensify strategies to decarbonize their activities.

From data intelligence and the use of disruptive technologies – such as the Internet of Things (IoT) and artificial intelligence – it will be possible to increase productivity and simultaneously reduce environmental impact in economic sectors such as agriculture, logistics and oil and gas.

High investments in technology reflect this interest. According to the “Smart Agriculture Market” research, published on the Markets and Markets portal⁷, the amount spent on software, hardware and technological services for precision agriculture, storage and agricultural production monitoring is set to jump from US\$ 16.2 billion this year to US\$ 25.4 billion in 2028 – with a constant annual growth rate (CAGR) of 9.4%.

In this scenario of **digitalization for decarbonization**, the information and communication technology (ICT) industry itself must seek a more efficient energy approach and solutions that contribute to mitigating the environmental impact of its activities.

FIRST FRONT: ENERGY

As recorded by the International Energy Agency (IEA), the electric consumption of data centres last year was between 1-1.5% of the





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total volume of energy produced in the world. In exact numbers, 201 TWh⁸, equivalent to 40.4% of all electricity consumed by Brazil in 2021 (497 TWh).⁹

The 'hyperscalers,' large-scale data processing providers, consumed the largest share: 93 TWh. Next came cloud servers (69 TWh) and traditional data centres (39 TWh).

Beyond data centres, measuring the total electricity consumption of the sector is a challenge, due to its vast capillarity. However, for the sake of analysis, the British consultancy Transforma Insights suggests, for example, that new devices equipped with IoT sensors will increase the sector's electric expenditure by 34 TWh by 2030.

Equally complex is the calculation regarding the GHG emissions of the ICT industry. According to the IEA, data centres and data transmission networks would account for 0.6% of global CO2 emissions¹⁰.

For researchers from Lancaster University (UK) and Small World Consulting, who authored the report *The climate impact of ICT: A review of estimates, trends and regulations*, from 2020, the more precise percentage would be between 2.1-3.9%.¹¹ In worse scenarios, such as the one estimated by Swedish researcher Anders Andrae, the world's data centres will consume about 20% of the electricity produced in the world, being responsible for 5.5% of carbon emissions.¹²

Seeking alignment with the goal established by countries in the Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC), to limit global warming to 1.5°C above pre-industrial levels, the ICT sector would need to reduce its emissions by 45% by the end of this decade – as guided by the International Telecommunication Union (ITU), the UN agency for information technologies.¹³

Therefore, all companies, organizations and governments that require data processing for their activities will need to embark on a **journey of energy efficiency in their IT strategy**, aiming to reduce GHG emissions and mitigate the environmental cost.

green4T has been working to reduce electricity consumption in data centres, private clouds and near-edge, far-edge ecosystems by up to 60% – essential parts of the technological infrastructure that have allowed the exponential growth of digital businesses.¹⁴

The strategy includes the adoption of multidisciplinary management actions, which operate in the physical (hardware) and logical (software) fields of data processing environments. The aim is to promote a more positive relationship between the energy consumption of the data we need on our digital journey.



Eduardo Marini, CEO, green4T

Part of this efficiency achieved is measured by the metric called Power Usage Effectiveness (PUE), which presents indices ranging between 1 and 3, where the latter indicates a highly inefficient infrastructure (spending 3x more than the possible efficiency scenario).

In 2022, our team of specialists produced a simulation regarding the optimization of PUE in Brazil – from 2.40 (consumption index of the sector in the country) to 1.67, close to the global average. This would allow for an energy saving of 4.7 TWh, equivalent to the electrical charge consumed by 2.4 million Brazilian families.

THE WATER FACTOR

Another relevant point in the debate about the energy efficiency journey of data is the reduction of water consumption in the cooling process of data centres.

This practice is common in the industry to prevent server overheating, especially among large 'hyperscaler' companies. One of these "tech giants," for example, claimed to have used 4.3 billion gallons of water – about 16.2 billion litres – for this purpose in 2021.¹⁵ Another company admitted to having consumed 84 million litres in the same year to cool just one data centre in Middenmeer, northern Netherlands.¹⁶

The connection between data processing and water consumption is simple to understand: the more the adoption of disruptive technologies like artificial intelligence and machine learning advances, the more the number of data processing cycles grows. This implies the development of even more potent computers that, to process quickly, use more energy and heat the servers. Water use comes in as an alternative to air induction cooling systems in the environment.



Video platforms like YouTube and chatbots are two examples of this relationship between data and water. In March, researchers from the University of Colorado Riverside and the University of Texas Arlington released a preliminary study indicating that every 20-50 responses from ChatGPT, Open AI's platform, would consume 500 ml of water to cool the machines that support the conversation.¹⁷

SECOND FRONT: CIRCULARITY

The other battlefield for the ICT sector in this crusade against global warming is the application of circular economy concepts in the working philosophy and management of these companies.

Reuse, regenerate, recycle and reduce are words that must be part of the guidebooks of infrastructure and operations (I&O) leaders to accelerate circularity in this market from now on.

Transitioning to the circular model can significantly contribute to reducing GHG emissions by up to 80%¹⁸, in addition to conserving natural resources and promoting sustainability.

Companies that adopt these practices have benefited from greater operational efficiency, reducing their production costs by 30%,¹⁹ and improving reputation, while contributing to fulfilling the United Nations Sustainable Development Goals (SDGs).²⁰

Extending the lifespan of IT infrastructure parts and components delays the replacement of expensive and energy-intensive machines, whose validity ranges from 10 to 15 years.²¹ This measure has a positive effect not only on the environment – by avoiding new raw material extraction – but also on corporate finances.

Another good practice relates to company culture. An estimate indicates that 52% of information digitally stored by organizations is useless. Moreover, the energy consumed to keep this data stored would generate 6.4 million tons of CO₂. If this behaviour is not altered, the volume of digital 'trash' could reach 91 zettabytes of data by 2025, overloading data centres and consuming energy unnecessarily.²²

A GREENER FUTURE

Although absolutely concerning, the IPCC's March report also indicates paths to a new world, shaped by models guided by sustainable and climate-resilient development.

This includes decarbonizing the economy, circular consumption, expanding access to renewable energy, more resources for protecting vulnerable countries, more efficient and clean transportation systems, among many other measures that allow human society to avoid the same mistakes made a century and a half ago, when fossil fuel-driven machines were adopted without any criteria.

A truly consolidated global circular economy will also allow meeting all the world's consumption demands using only 70% of the raw materials we currently extract from the planet – which would bring Humanity back within safe limits and the preservation of life on Earth.²³

In a greener future and more averse to waste, optimization is necessary – and information technology has a vital role to play in this process.

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Brazil's largest water reuse project

Aquapolo



www.aquapolo.com.br

Aquapolo is a model of sustainability; the project has proved its environmental, social and economic value to big companies such as Braskem and Bridgestone, as well as to the whole ABC region, (a large industrial region in Greater São Paulo) where water infrastructure is crucial.

Aquapolo has also set a great example of successful public-private partnership, with an innovative model where the customer participated in the project's conception and helped establish the guarantees and collaterals for Project Finance.

Last, but not least, Aquapolo has generated local positive impact by helping companies understand the real value of water and how it should be correctly measured by companies and large users, not only by its tariff, but also through the risk of not having water and the impact companies are causing to both the communities where they capture it and nature itself.

The Aquapolo Ambiental case – São Paulo-SP, Brazil

The implementation of Aquapolo Ambiental in the ABC region of São Paulo is the most relevant case, of the last 10 years; the project required water source diversification in a location with structural water stress that impacted public supply and large-scale economic activities. By recycling effluents to produce water for industrial purposes, Aquapolo delivered "zero impact" of climate change on several industries in the region, while directly contributing to reducing competition for drinking water between the industrial sector and the population and other sectors of the

local economy. This enterprise has directly contributed to improving the quality of life and social and economic development in the region.

Water stress in the metropolitan region of São Paulo, comprising the state capital and 38 satellite municipalities, is a growing reality; due to the increasing pollution of water sources and the impact caused by climate change. A group of 7 cities in the region, form what we call ABC Paulista. With a population of almost 3 million people and more than 24,000 industries, the ABC region has a water availability of only 130m³/inhabitant/year, or about 5% of the UN's recommendation.

Currently, the Brazilian industrial sector, and specifically in the ABC region of São Paulo, has two sources of water: direct capture from surface (rivers and lakes) or underground (wells) natural sources; or the provision of potable water through the public supply. Directly or indirectly, industries consume part of the water available in the basins where they are located and compete with domestic consumption and other economic activities, especially in locations where there are large industrial consumers and limited availability. Water consumption tends to grow with the increase in population and economic activity, and in view of this, any contribution towards lower consumption and



reducing pressure on water sources in order to guarantee availability for essential use are welcome and should be encouraged.

From the point of view of the industrial sector, the risks and costs associated with water insecurity may be one of the most important factors that influence strategic decisions regarding the location of investments or to guarantee the sustainability and return of investments already made.

In 2008, the industries of the Capuava Petrochemical Complex, located in Mauá (1 of the 7 cities in ABC region), decided to look for alternative sources of water, one of the most important resources in the operation of its industrial plants. At that time, the Complex was facing high maintenance costs due to the poor quality of the water collected from the river it was using, in addition to higher requirements from environmental agencies. Even more important was the need to reduce the environmental impact of its operations and guarantee a supply of water regardless of the impact of climate change.

Based on the scenario described, Aquapolo Ambiental was formed, the result of a partnership between GS Inima Industrial and Sabesp, the largest enterprise for recycling water from treated effluent in Latin America and one of the largest in the world, with the capacity to produce and supply up to 1,000 litres of recycled water per second. This volume is enough to maintain a city of 500,000 inhabitants.

Using effluent treated by Sabesp's ABC Sewage Treatment Station, Aquapolo produces recycled water with physical-chemical quality similar to drinking water. The recycled water quality parameters were established together with the customers and were decisive for the technological route of the company's process. The Aquapolo process, known in the industry as tertiary treatment, consists of a biological reactor with an anoxic chamber followed by an aerobic process designed to remove nitrogen, phosphorus and organic matter. Then, the water passes through an ultrafiltration system using submerged membranes with a porosity of 0.05 microns, retaining particles, viruses and bacteria. In order to meet contractually determined parameters, part of the water produced still undergoes a nanofiltration process, using reverse osmosis technology to reduce conductivity. The final step is what we call a "blend", that is, the combination of part of ultrafiltered water with osmosis water, thus achieving the quality contracted by the customers, before dosing chlorine dioxide as a final disinfection process for pumping to customers through our 17-kilometre pipeline that leaves São Paulo and crosses São Caetano do Sul and Santo André, before arriving in Mauá, where most of our customers are located. After arriving at the Capuava Petrochemical Complex, the recycled water still travels through an internal network of almost 4 kilometres to distribute water among all the plants of the various industrial clients in the Complex.

Monitoring the quality of recycled water is done online by Aquapolo and its customers, who have real-time access to the company's instruments. Periodic analyses of various quality parameters are carried out by internal and external laboratories. Aquapolo also has recycled water reservoirs with a capacity of 35,000m³ that guarantee supply to customers, even in the event of a production stop or maintenance at its plant.

Braskem, one of the largest petrochemical companies in the world and which operates 4 plants in the Capuava Petrochemical Complex, has a 42-year contract to supply recycled water with Aquapolo, thus guaranteeing availability, sustainability and water security for

AQUAPOLO

The largest enterprises for recycling water in Latin America and one of the largest in the world, Aquapolo is the result of a partnership between GS Inima Industrial and SABESP. Developed as a water management solution for climate change, since 2012 Aquapolo has been providing recycled water for the industrial sector in São Paulo and its satellite cities.

Innovative, sustainable and pioneering in Brazil, Aquapolo has the capacity to produce up to 1,000 litres of recycled water per second, using the most advanced technological processes existing in the treatment of water and effluents. This volume is equivalent to the supply of a city of 500,000 inhabitants. During the worst drought São Paulo has ever suffered, in 2014-15, when Aquapolo's customers operated normally with no impact at all, and without competing for water with the population.

its operations until 2054. By understanding the real value of water, this initiative has ensured Braskem and other Aquapolo clients went through the period of the worst water crisis in the history of the metropolitan region of São Paulo between 2014 and 2015 without any impact or reduction in their consumption and consequently on their operations. In fact, the company even began to expand its production at that time. In the same period, other plants in the region of Paulínia-SP, located in the PCJ basin, had to suspend their activities due to lack of water in the region. Braskem is so confident in Aquapolo that the company uses recycled water to meet 97% of all its water needs. In 2015, shortly after the crisis, Braskem stated that "Aquapolo is not a supplier of recycled water, but an industrial management solution in the face of climate change".

From Braskem's perspective, the implementation of Aquapolo in the ABC region avoided a historic loss that could have reached around USD 100 million in 2015 when the crisis hit the Alto Tietê basin severely. This calculation, developed by the company itself, considers a scenario of annual water flow restriction of 30%, which could affect production and consequently the company's results. Additional to the reduction of operational risk, the company still saves tens of millions of dollars annually in its operations, due to the quality of the recycled water, which allowed the company to double the number of cycles of its cooling towers, expanding the recirculation of water, reducing the number of interventions and maintenance costs with equipment, consequently reducing the exposure of people and the associated risks of accidents at work.

After the 2014-15 water crisis, Aquapolo has grown its customer base along its pipeline, serving industries in other sectors such as aluminium, copper, tyres and packaging and plastic films. Together, Aquapolo customers consume almost 1 million cubic meters of recycled water per month. By using recycled water in their operations, they benefit their communities and population by no longer competing directly or indirectly for potable water. At the same time, companies are safe to remain in the region and plan their local investments, generating jobs and income for the local community. Aquapolo is an important lever for the social and economic development of the ABC region of São Paulo.

Since the beginning of its operation, in 2012, Aquapolo has supplied more than 110 million cubic meters (110 billion litres). This volume would be enough to supply a city of 300,000 inhabitants for the same period for more than 10 years. Other highlights of the company are:

- » Operational availability 99.99% of the time, that is, only with scheduled stops and without customer shortages
- » Quality met 99.94% of the time, and at other times with insignificant deviations and no impact on customers
- » Zero work accidents with leave in the company's history and more than 7 years without any work accidents
- » Customer satisfaction rate of 98%
- » Environmental education action for more than 6,000 children in the ABC region and São Paulo
- » World's only subsidy-free water recycling venture.

Aquapolo and its recycled water directly contribute to 5 UN Sustainable Development Goals:

- > **SDG 6 – Drinking Water and Sanitation**
- > **SDG 9 – Industry, Innovation and Infrastructure**
- > **SDG 11 – Sustainable Cities and Communities**
- > **SDG 12 – Responsible Consumption and Production; and**
- > **SDG 13 – Action against Global Climate Change.**

The company has national and international recognition with awards from institutions such as Global Water Intelligence, ANA – National Water Agency, FIESP – Federation of Industries of the State of São Paulo, BID – Inter-American Development Bank with Harvard University, among others. In 2022, Aquapolo was recognized as a Climate Smart Utility by the IWA – International Water Association, being one of the thirteen most inspiring cases of action for mitigation and adaptation in the face of climate change.

In a recent study from Stanford University, compared to drinking water, recycled water was found to be possibly safer than drinking water. This is because the source is the treated effluent and, in turn, requires more control barriers than the current water purification processes from natural sources considered clean and of good quality. Aware of these studies and global trends in water recycling, Aquapolo believes that this quality water supply model should soon be extended to a model for recharging natural sources of water, as a solution to expand availability of water in regions of water stress in Brazil. This is a worldwide trend with real cases such as Orange County, California, Singapore and Windhoek, Namibia.

A second trend currently being discussed in the industry is the "WaterPositive+" concept. This is a concept similar to the carbon concept, meaning, it is up to each company or user of water on the planet to know its "water footprint" and work to recharge natural sources in the same or higher volume used, with clean and treated water, minimally on the same level as it was taken from nature. Aquapolo is ready to recharge nature on others' behalf to make sure companies neutralize their water footprint.

Upon completing 10 years of operation in December 2022, Aquapolo established 2 public sustainability commitments, adding more value to recycled water and contributing even more to its customers' ESG agenda:

1. Neutralize 62% of your carbon footprint by 2025 and become carbon neutral by 2030; and
2. Neutralize its direct-use water footprint by 2025.

With the mission of "Transforming and inspiring society, through water recycling, contributing to perpetuate life", Aquapolo Ambiental works to guarantee water sustainability and the future of humanity!



How energy storage solutions are bringing electricity to remote and isolated communities in Brazil

More than one million people in the Legal Amazon alone lack access to electricity.

The Amazon region, with its unmatched expanse and natural beauty, is one of our planet's most precious treasures. However, many isolated communities in the Amazon face significant challenges, especially when it comes to reliable and sustainable access to electricity. In this context, initiatives and technological solutions involving the use of photovoltaic panels and lithium batteries are democratizing access to electricity in the region.

In the Amazon, electrical infrastructure is scarce or non-existent in many areas, leaving local communities dependent on polluting and inefficient diesel generators or even without complete access to electricity. Energy is an enabler for the economy, connectivity, education and health. This scenario hampers the quality of life for these communities, leaving people in these regions vulnerable and contributing to environmental degradation in the area.

According to Brazil's Energy and Environment Institute, more than 1 million people live without access to public energy services in the Amazon region alone.

Energy poverty is when an individual or a family struggle to access energy services, including electricity, natural gas, heating and cooling, with significant impacts on the health, well-being and quality of life of those affected. It is also related to environmental issues, as the improper use of polluting energy sources can lead to waste and excessive greenhouse gas emissions.

To solve and democratize access to efficient and sustainable electricity, various initiatives are being implemented. UCB, the largest stationary battery manufacturer in Brazil, has adopted a multifaceted approach that combines the capture of solar energy through photovoltaic panels with effective energy storage systems using lithium batteries

manufactured in Brazilian territory. This combination allows isolated communities to have access to reliable electricity day and night without relying on polluting sources.

Between 2021 and 2022, the supply of batteries for remote systems increased fivefold, driven by the "*Mais Luz para a Amazônia*" project, a federal government initiative to increase access to electricity.

With strategically installed solar panels in areas with the highest sun exposure, they convert sunlight into electricity. This not only reduces dependence on fossil fuels but also harnesses the abundant source of energy that the Amazon region offers.

One limitation of solar energy systems is their reliance on sunlight. However, the system overcomes this challenge through energy storage systems using more efficient lithium batteries connected to photovoltaic panels,



UCB

The largest brand for energy storage solutions in Brazil and Latin America. With 50 years in the market, it combines extensive experience in electronics manufacturing and operational agility. UCB provides stationary batteries, portable ones for cell phones and laptops, and those for electric mobility. It has 2 factories in Brazil. It is a signatory of the UN Global Compact and a leader in providing energy storage solutions for remote communities.



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storing excess electricity generated during the day for use at night and on cloudy days. The company has already supplied over 35,000 batteries for applications in isolated communities.

One of these innovative projects is in the community of Santa Helena do Inglês, which is 60 km away from the capital of the Amazonas state, Manaus.

The project was conceived by the Sustainable Amazon Foundation (FAS) in partnership with UCB, with the installation of an Isolated Mini-Grid System for Electricity Generation and Distribution with a total capacity of 259 kWh, replacing an existing diesel system, eliminating the consumption of diesel that emitted 143.3 kg of CO₂ daily and an annual emission of 52.3 tons,

equivalent to planting 12,000 trees. This initiative benefited 32 families, more than 100 people.

In addition to installing the systems, UCB also invests in training and capacity-building for local communities. This not only ensures that the systems are properly maintained but also empowers communities to manage their own energy resources in the future, with a direct effect on reducing carbon emissions, improving quality of life, sustainable development and environmental preservation.

Companies like UCB and organizations are playing a crucial role in transforming the Amazon's energy landscape, bringing hope and clean, sustainable electricity to isolated communities through technology.

This hope for efficient and sustainable energy for isolated communities can unlock decades-old challenges in other regions of the planet as well. This is the case in Africa, where approximately 600 million people lack access to electricity.

Clean and renewable energy is the path to the future, and the projects implemented in the Amazon are proof of this necessary evolution.

A better climate future can happen

Consistent, coherent and continuous climate action is needed now.

People—and things created and used by people such as buildings, businesses and transportation—produce carbon footprints. A carbon footprint is the total amount of greenhouse gases generated by a structure or an activity. To place carbon footprints in perspective, a person living in the United States has a carbon footprint of approximately 16 tons¹, while the global average² for carbon footprints is approximately 4 tons.

This difference in carbon footprint points to another startling statistic. According to the United Nations Conference on Trade and Development³, 46 of the least developed countries (LDCs) produce only about 4% of the world's average carbon emissions. However, the 46 LDCs have experienced 69% of the deaths caused by climate-related disasters during the past 50 years. With carbon footprint,

carbon emissions and climate-related impact statistics in mind, developed and developing countries must assume responsibility for curbing carbon emissions.

Straightforward solutions exist for taking a different path

Many types of obstacles clutter the path to reduced carbon emissions and energy efficiency. Traditional business requirements, budgetary pressures, and politics at the international, national, regional, and state levels have slowed and sometimes hampered the transition to sustainable practices. However, solutions that can help reduce carbon emissions and create energy efficiencies exist.

For example, the current built environment⁴ contributes 40% of annual global carbon emissions. Of that overall percentage,



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building operations account for 27% and building construction and infrastructure materials make up the remaining 13%. Each building consumes energy for the lighting, heating and cooling systems that maintain comfortable indoor environments for residents. Each environmental control system also generates carbon emissions.

Different technology-driven solutions exist for the carbon emissions and energy consumption problems seen with buildings. For example, connected lighting systems⁵ built around efficient LED technologies could save millions of tons of carbon emissions and reduce the demand for electricity. While LED lighting can offer direct energy savings of 50–70% over conventional lighting, connecting LED lighting systems to smart controls, the IoT and other environmental control systems can increase those percentages. In addition, the installation

and use of human-centric connected systems⁶ align with improving well-being and productivity.

Building designs can also move away from materials that release millions of tons⁷ of carbon emissions during extraction, manufacturing, transportation, construction and disposal. Architectural firms and construction firms can prioritize moving away from the use of conventional building materials such as concrete, steel and insulation to low-carbon, carbon-neutral or carbon-storing materials. New types of concrete,⁸ for example, may reduce carbon emissions by 60%. In addition, firms can reduce emissions associated with manufacturing practices by specifying the use of recycled or reclaimed materials⁹ for buildings.



Commitments to sustainability begin with policy decisions

During the past decades, the United States, the European Union and other governments have made crucial policy decisions that target zero carbon emissions by 2050. In the United States, the Inflation Reduction Act of 2022¹⁰ includes tax incentives for installing energy efficient equipment such as LEDs, new types of building insulation and heat pumps.

The European Green Deal¹¹ addresses key policy issues such as accessible and affordable clean energy transportation, creating markets for clean technologies and products, and stimulating the renovation of 35 million public and private buildings. In addition, the EU's RePowerEU plan¹² focuses on energy savings, diversifying energy supplies, and implementing renewable energy sources.

Gambia, Mali, Costa Rica and other smaller countries¹³ have also addressed climate change through projects and strategies. In Gambia, the Household Disaster Resilience Project provides financial support for local efforts to improve awareness about climate change, support

green business and change to new agricultural practices that include agroforestry. Mali has converted diesel-powered mini-grids to solar, hydro and biogas technologies in an effort to cut carbon emissions by 5,000 tons. Costa Rica relies on renewable energies and provides incentives to communities and landowners to preserve forests and increase biodiversity.

Mitigating climate change requires consistent, coherent and continuous action

The consequences of climate change become more apparent with each passing day. According to a report¹⁴ from the US Office of the Director of National Intelligence, without action from countries, corporations, businesses and individuals, global temperatures will likely continue to increase and weather events will continue to set new standards for extremes.

Although political leadership may change, countries cannot step away from their policy commitments to mitigate climate change. However, setting and adhering to policies is only one step. Corporations and



businesses can commit to methods and technologies that reduce carbon emissions and reduce energy consumption. Every person can drive the changes that prompt those commitments.

To learn more about how connected technologies align with global energy policies, read our white paper **Good connectivity: a key to decarbonizing the building sector** here¹⁵

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Cosmos 3D – what will the future of construction look like?

INNOVATION AND SUSTAINABILITY FOR A NEW WAY OF CONSTRUCTION

A house is much more than just a building that welcomes people. From the ancient caves of prehistory, transitioning through the tents in vast deserts to the majestic castles, and finally culminating in the modern architecture of our era, a house has always symbolized protection, presence, possession and identity. Having one's own space and personalizing it taps into the fundamental desires and aspirations inherent in human nature. The importance of these homes, these personal spaces, has solidified the real estate market's position as one of the most robust and influential sectors globally.

A DEMANDING AND CHALLENGING SCENARIO

With 2030 on the horizon, the UN predicts a significant housing challenge. They project a housing deficit impacting 3 billion people.¹ To grasp the magnitude of this issue, the United Nations Human Settlements Program provides a telling figure: to bridge this gap, we'd need to construct 96,150 homes every day, which equates to 4,000 every hour. Also there are other important issues. The construction industry contributes to a sizable portion of the world's solid waste. Additionally, it's responsible for over a third of the global energy demand and around 37% of 2021's carbon emissions.² How can we address these interconnected challenges?

TECHNOLOGY AND INNOVATION

A validated solution emerges in the form of the concrete 3D printer. Designed to tackle the global housing shortage, it blends efficiency with sustainability. To illustrate its potential, consider this: it's feasible to build a comfortable 45 m² home in only 15 hours. One machine is capable of manufacturing up to 120 homes each year.

BREAKTHROUGH WITH COSMOS 3D

With Katz Group's construction expertise and IT3D's technological prowess from Spain, they've carved a new path in the world of 3D printed concrete homes. This collaboration not only represents a merging of two giants but also introduces a modern and practical solution for the evolving housing and structural landscape. Katz Group and IT3D, both leaders in their respective fields, have joined forces to create COSMOS 3D.

Source:

1 According to information provided by UN Habitat

2 According to the "2022 Global Status Report for Buildings and Construction-UNEP"



NEW PATHS, NEW PERSPECTIVE

Driven by a vision of a more sustainable future, there's an emphasis on championing green building practices at COSMOS 3D. Advanced methods aim to reduce waste generation by up to 90%, a feat made possible through full automation and meticulous oversight of material usage.

With an ambitious roadmap in place, the goal is to achieve carbon neutrality by 2030. Acknowledging the significant carbon footprint of traditional cement, there's a dedicated pursuit for eco-friendlier material alternatives for a substantial reduction in greenhouse gas emissions.

Looking ahead, the aspirations for COSMOS 3D are vast. Over the next three decades, the goal is to impact the lives of people worldwide, envisioning the construction of millions of new homes.

LET'S BUILD THE FUTURE TOGETHER!



cosmos3d.tech



COSMOS 3D

Joining the construction expertise of Katz Group with the advanced technology of IT3D, COSMOS 3D champions the initiative of 3D-printed concrete home construction. This collaboration promises not only to expedite construction but also to substantially reduce associated costs, waste and environmental footprints, all while addressing the looming global housing deficit.

🌐 cosmos3d.tech 📷 [@cosmos3d_tech](https://www.instagram.com/cosmos3d_tech)

KATZ GROUP

Originating in 1975 in Belo Horizonte, Brazil, Katz has since become a hallmark of excellence and refined taste in regions like Minas Gerais, Bahia and São Paulo. With a reputation for pioneering, creative and secure projects, Katz Group stands out in the national real estate landscape.

🌐 katz.eng.br 📷 [@katz.life.style](https://www.instagram.com/katz.life.style)

IT3D GROUP

Specialists in the 3D solutions development and innovation. With Official Partners in more than 30 countries, IT3D Group is an international benchmark in 3D technology. 4.0 Industry, Research, Education and Smart Construction are some of its influence fields.

🌐 it3d.com 📷 [it3d_group](https://www.instagram.com/it3d_group)



SOMA Group

SOMA Group is the biggest fashion group in Brazil. With a platform of brands that maintain their identities, SOMA innovates and reinvents the M&A (Merger & Acquisition) process. Today we are a great and efficient union of talents and expertise.

SOMA Group: road to decarbonization



www.somagrupo.com.br/en/

What the biggest fashion group in Brazil is doing to reduce its climate impact: clear goals are key to achieve results and transparency.

The SOMA Group strengthens its practices and searches for responses to climate change every year. It is key to reinforce the importance of assuming climate commitments, which is why, in 2021, we joined the UN Global Compact and assumed commitments with the 2030 and 2050 Agenda. Even with the absence of a regulated carbon market in Brazil, the SOMA Group has been voluntarily positioning itself with the mapping of its emissions through annual Greenhouse Gas Inventories and offsets with investments in reforestation and regeneration projects through agroforestry systems (this process effectively removes CO₂ from the atmosphere through photosynthesis in trees) and the purchase of carbon credits from investment in renewable energy, which contributes to the transition to a renewable energy system and a low-carbon economy. It is important to emphasize that the offset strategy goes hand in hand with the reduction of emissions, strengthening the decarbonization process in order to have less emissions to offset throughout the years.

To this end, having clear goals is essential to bring solidity and transparency to the company in the decarbonization process in the quest to achieve Net Zero by 2050. Several actions were linked to the commitments assumed by the Company with the UN Global Compact and the annual reports to the Carbon Disclosure Project (CDP), in which SOMA Group achieved a B score, meaning that we have a solid management regarding climate change. In addition, the CDP is also aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). We also adhere to the science-based target design framework (SBTi) to control global temperature

rise by up to 1.5°C. and we are working on a reduction plan, with intermediate targets, to be submitted to SBTi in 2023.

It is also extremely important to go through a process of mapping climate risks associated with the business and operations. We map physical risks, associated with natural phenomena, and transition risks, which include changes in habits and new policies aligned with our ESG strategy. Among the physical risks, we highlight the possibility of climate disruptions, such as strong winds and rains that can directly impact our offices, distribution centres, logistics processes, inventory and interruptions in the supply chain process. The scarcity of rain is also a phenomenon that can affect our supply processes.

Thus, as a form of investing in the Climate Agenda, SOMA Group allocates funds exclusively to environmental actions: whether for hiring consultants, renewing subscriptions to platforms for managing environmental parameters and structuring our Greenhouse Gas Inventory annually, prioritizing the use of responsible raw materials, for compensation of our emissions and for reforestation projects as a way of helping to restore the carbon balance in the atmosphere.

All of SOMA Group brands are included in our Greenhouse Gas Inventory and are part of our emissions reduction strategy (available in our latest sustainability report on our website). SOMA Group has a centralized guideline governance that extends itself to all of our brands and areas.



Lunelli: Fashion with Significance

“Make Fashion with Significance to promote a positive impact in the world and for all.”

Committed to establishing responsible relationships between people and the environment, we look back at the past proud of everything that has brought us this far, ensuring that our choices and visions for the future are going to lead us to a sustainable growth.

Combined with the business ideology our sustainability vision, “Make Fashion with Significance to promote a positive impact in the world and for all,” inspires and guides our business model to manage and reduce the negative economic, social and environmental impacts of our activities.

Based on this outlook, our sustainability strategy harmonizes and interconnects three core elements of ESG: environmental protection, social inclusion and economic growth, establishing eight major initiatives:

1. Integrate sustainability into strategy, management and culture
2. Improve risk management and compliance
3. Promote a diverse and safe environment
4. Reduce the environmental impacts of operations
5. Improve social investment management
6. Develop sustainable products
7. Educate for sustainability
8. Engage the public whom we maintain a relationship with.

In 2022, as the result of these major initiatives we highlight:

- › **+4,600 employees: 68% women and 32% men**
- › **R\$ 20.4 million in profits shared with employees as a result of the annual goal program**
- › **Compliance channel: 100% of the reports analyzed**
- › **R\$2.2 million invested in employees training and development**
- › **4,500 hours on leadership program**
- › **+2,000 tons of textile waste sent for recycling**
- › **3% reduction in total generated waste**
- › **Responsible operation with 86.7 litres of water per kg of fabric produced**
- › **1.7 kWh of electricity per kg of fabric produced.**

To Make Fashion with Significance, it is necessary to consider the textile value chain that refers to the many stages involved in the production and distribution of textile products and practices, be attentive to identify the needs and expectations of the people and each stakeholder to understand and measure the impacts of our activities.

In the beginning of 2023, we updated our ESG Materiality Assessment and Benchmarking Analysis by an extensive, active and engaged listening program that involved representatives of each stakeholder. As a result of the analysis and according to Lunelli's ESG Guidelines and Diagnostic, our sustainability strategy was revised, and the “Walk the Talk” communication program was created.

“Walk The Talk – Dialogues for a more responsible future” has the purpose to promote and encourage the discussions on the ESG agenda. The name of the event itself emphasizes and prioritizes the importance of coherence and consistency of what Lunelli's premise is: to always communicate proposing an open dialogue with its stakeholders.

During this year we are sponsoring four “Walk the Talk” events, divided into four themes:

1. **Governance:** best compliance and stakeholder management practices
2. **Environmental:** best environmental management practices and efforts to reduce the negative impacts
3. **External Social:** industry's and community relationship and the social investment
4. **Internal Social:** best practices for a great place to work.

We believe that companies play a fundamental role in building a better world, strengthening and multiplying ESG better practices, and that is why we are sponsoring the “Walk the Talk”, promoting a space to listen, learn, discuss, share information and opportunity for new businesses and create partnerships.

Committed with and continuously seeking our positive impact in the world, we want to improve people's lives through opportunities, products and services, seeking to reduce and mitigate the negative impacts of our activities, promoting social, cultural, environmental and economic welfare and making fashion that brings significance to the lives of those who choose to wear it.

Lunelli

Lunelli is a textile company that has been operating in industry and retail for more than 40 years: through 8 brands, more than 20,000 customers, 4,700 employees and 14 units installed in Brazil and Paraguay, producing more than 15,000 tons of fabric and 23 million garments per year.





Make the Green Switch

Light the way to a greener, smarter and more prosperous planet:
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