RESPOND

COP25 CHILE

MADRID 2019

COP25

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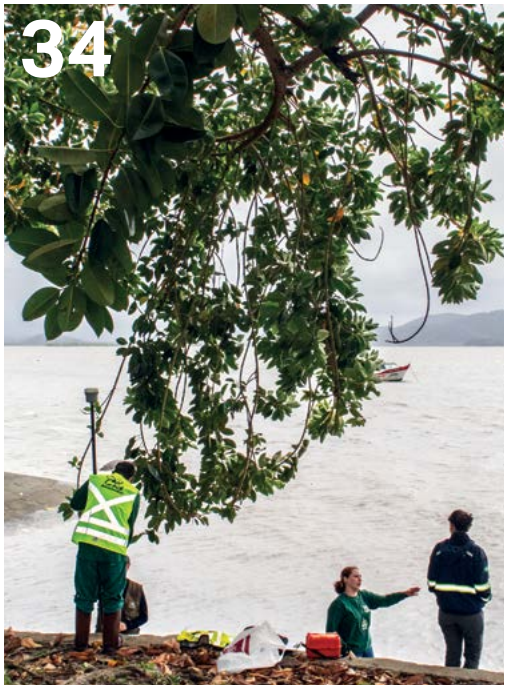

CONTENTS

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Dear friends, please receive our very warm greetings.

As you know, this year, 2019, is a very important year for the protection of our oceans from climate change.

Our knowledge of the oceans, although still limited, has provided considerable information and evidence that turn on the alarms to push us to promote concrete actions to protect our oceans.

The IPCC special report on the oceans is a very important document that will give us scientific evidence that shows the need to move fast, with urgency, to protect our oceans.

Time is running out. This is why Chile has been pushing to highlight this problem. In our vision there cannot be an effective global response to climate change without a global response on the ocean issues.

For Chile, presiding over COP25 represents a great opportunity to put the ocean issues in the climate agenda. So, we await you all in Madrid in December this year. In the "Blue COP," we will make great changes.

Carolina Schmidt
COP25 President and Chile Environment Minister

Adapted from a video addressing a special preparatory meeting in Madrid in spring 2019.

TIME TO WALK THE CLIMATE TALK by Harry Verhaar

Conversations about the climate crisis play out very differently today than they would have just ten years ago. Thanks to the efforts of the UN, organisations such as The Climate Group, the media, and, not least, a group of educated and vocal Gen-Zers, public debate has become much more widespread and far more demanding. Climate has taken its place as the most pressing issue on the agenda of many of the world's governments.

Outside of a few dwindling pockets of naysayers, human-effected climate change is no longer up for debate. Indeed, humanity's impact on the planet can hardly be contradicted when the evidence is so tangibly all around us, most visibly through weather anomalies and natural disasters. Amid public outcry at the burning Amazon, an area of forest the size of the Netherlands has been devastated by forest fires in Siberia. And in Greenland, the delicate balance has been distorted, and currently around 300 megatonnes of extra meltwater is released each year from declining glaciers. That's equivalent to 40 years' worth of drinking water for today's world population, in one year alone.

The time for action

The scale and nature of this crisis is huge and unprecedented. The challenge: the climate crisis is the first crisis we have to resolve before it fully unfolds. There can be no question that the time for talk is over. Now we need to see urgent action in line with what climate science demands.

Four years have passed since the Paris Agreement. It seems barely credible that, after signing up to this commitment, leaders are continuing to debate what needs to be committed to and when. This lack of resolve should be both an international embarrassment and a public outrage. We teach our children that they have fixed ambition levels and deadlines for schoolwork that are static and non-negotiable, yet as adults in society, we fail to hold our leadership to the same standards. I don't believe that the public needs parenting. But business and political leaders are here to serve public ambition. It is high time that our political leaders embrace and confirm that the required ambition level is (global and national) *carbon neutrality* and the deadline is ***at latest by 2050***. This is the legacy the next generation deserves, and we must set about achieving it now.

Meaningful targets

The Climate Group is driving a series of first-class programmes; among them, the LED Light Savers program, RE100, EV100; and from the World Green Building Council, the Net Zero Carbon Buildings program. These initiatives turn talk into action and have Signify's unequivocal backing. We can make sure the climate neutrality ambition delivers results by holding our time and efforts to what I call the 10/20/70 rule. That means spending 10% of our time and effort in *inspiration*, creating awareness and education on why we need to become carbon neutral. 20% of our efforts should be on *aspiration*, defining more closely what we'll do, and by when. But the majority of our time, the remaining 70%, has

Signify CEO, Eric Rondolat, speaking at the UN Climate Action summit

SIGNIFY

Signify is the new company name of Philips Lighting. We are the world leader in lighting and provide our customers with high-quality, energy-efficient lighting products, systems and services. We turn light sources into points of data to connect more devices, places and people through light, contributing to a safer, more productive and smarter world.

to be spent on *perspiration*, by which I mean, rolling up our sleeves and getting the job done.

So, let's put a line in the sand and commit to something quantifiable. Global carbon neutrality by 2050 is achievable if governments make this a priority target, set meaningful milestones, and cast this ambition level into law. Governments must enable regulatory frameworks and hold themselves continually and consciously accountable. Political leaders can apply the third part of the 10/20/70 rule by creating Net Zero Carbon Building programmes for government buildings, by converting all public building electricity consumption to renewable energy, and by joining EV100 and switching ministerial car fleets to EVs. These actions will create case studies, jobs, and a positive example that enhances public engagement and support. Not least, we shouldn't underestimate the learning that will help to fine-tune policies and financial instruments so that these deliver better results in shorter periods of time.

As businesses, we can afford to do even better, and we encourage companies to aim for carbon neutrality at latest by 2030. In ten years' time, what we now consider best practice must be common practice.

To demonstrate this in action, we like to use the 3% rule. If we achieve an improvement rate of 3% energy efficiency each year, driven by a similar 3% in infrastructure (mostly building) renovation rates, combined with a 3% increase in the use of renewables per year, we will be well on the way to achieving a carbon-neutral world by 2050.

Good for business

There's no doubt that having zero-carbon operations will be good for business as consumers become more aware and B2B customers hold their supply chains under closer scrutiny. At Signify, we're taking this so seriously that sustainable operations is more than just a public

commitment, and more than a point of commercial differentiation. We've made it core to our company purpose. We're doing it because it's the right thing to do.

We also want to show what's possible. As a large global organisation, we have a unique opportunity to model how we got our business on course to be carbon neutral by 2020. It has required great ambition and some important decisions along the way, but crucially, we're proving that it's possible. We're aiming for 100% renewable energy, and we're almost there, running currently at 92%. We're switching our fleets of company cars to electric and hybrid vehicles. We're making our own buildings carbon neutral. We've created offset programmes to close the remaining gap. And perhaps most importantly, we've built sustainability into our product design, with each product scored for a circular economy. Everything we do is driven by approved, science-based targets. We've done this in just five years, and if we can do it, others can, too.

Harry Verhaar,
Head of Global Public & Government Affairs,
Signify

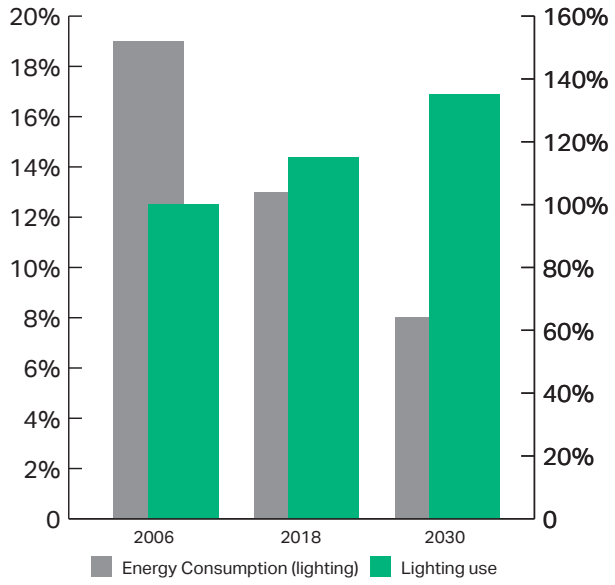
Harry Verhaar has over 20 years of experience in the lighting industry and is Head of Global Public & Government Affairs for Signify. He is responsible for the strategy, outreach and stakeholder management on energy & climate change, resource efficiency and sustainable development, with a key focus on the role of the LED lighting revolution.

He has since the end of 2003 been the architect of the lighting strategy on energy and climate change, which has resulted in a global momentum on phasing out of old lighting technologies.

He is an active member of a number of partnership and stakeholder networks, among which The Climate Group; Regions20, the World Green Building Council and of the UN Environment Science Business Policy Forum. He is responsible for Philips' relationship management with the UN and is a founding member of UN Environment's en.lighten program and the SE4All's Global Energy Efficiency Accelerator Platform. He is chairman of the European Alliance to Save Energy and is former president of the Global Off-Grid Lighting Association.

He holds a MSc in Solid State Luminescence from the University of Utrecht, The Netherlands.

Payoffs
The payoffs of investing in sustainable technology are significant and more immediate than one might think. Some people once thought it impossible to phase out the incandescent light bulb. In 2006, when we called for such a transition, lighting accounted for 19% of global electricity use. Since then, the lighting sector has gone through one of the fastest transitions we have ever seen. By 2018, electricity consumption had fallen to 13% and by 2030, it will be just 8%. At the same time, the number of light points is on the rise, and by 2030, there will be about 35% more. It's a great reminder that growth and energy consumption need not go hand in hand. They can be decoupled, enabling socio-economic development while at the same time contributing to protecting our climate.



So, my call to action is simple: let's close the gap between commitment and action and get behind a carbon-neutral world no later than 2050. As businesses, let's lead the way by committing to becoming carbon neutral by 2030 at the latest. And let's make sure that in our conversations in ten years' time, we're able to reflect on our actions and our momentous progress in overcoming this greatest challenge to humanity's future.

www.signify.com

Prince Sultan Bin Abdulaziz
International Prize for Water

Recognizing Innovation

Invitation for Nominations

9th Award (2020)

Nominations open online until 31 December 2019

www.psipw.org e-mail: info@psipw.org

THE GLOBAL ENVIRONMENT FACILITY

The Global Environment Facility was established to help tackle our planet's most pressing environmental problems. The GEF has provided over $18.1 billion in grants and mobilized an additional $94.2 billion in co-financing for more than 4,500 projects in 170 countries.

GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

We are at a pivotal moment. The longer we delay in tackling climate change, the less likely we are to limit warming to 1.5°C above pre-industrial levels by 2100—and the higher the risks and costs. According to the Intergovernmental Panel on Climate Change (IPCC), limiting warming to 1.5°C is not impossible, but would require unprecedented transitions in all aspects of society.

We need to both reduce atmospheric greenhouse gas concentrations and to develop ways to adapt to the changes that are now unavoidable. We need to transform the systems that support how we live, how we eat, how we move, and how we produce and consume. With its unique mandate across multiple Multilateral Environmental Agreements, including as a financial mechanism to the United Nations Framework Convention on Climate Change (UNFCCC), the Global Environment Facility (GEF) is well placed to help catalyze the required transformation.

The GEF is working to promote proven mitigation actions that can reduce atmospheric greenhouse gas concentrations. Such actions include, for example, promoting renewable energy and energy efficiency, integrated urban management, and forestry and improved land use. The GEF is also supporting the Capacity-building Initiative for Transparency (CBIT), which helps developing countries monitor and report on progress toward their commitments under the Paris Agreement.

Decarbonisation of the global energy system is critically important for a future global temperature increase that is in line with the Paris Agreement. Since 1995, the GEF has provided $2.5 billion and leveraged $25 billion from other financing sources in support of expansion of renewable energy supply and improvements in energy efficiency.

The GEF has adopted an integrated and systems-based approach to catalyse a transformational shift towards sustainable urban growth under its Sustainable Cities Impact Program. This program helps cities adopt integrated approaches to invest in cross-sectoral integrated solutions for large-scale decarbonization and enhanced climate resilience of cities. The programme is facilitating improved land use planning, infrastructure integration, circular economy approaches, and resilient urban design.

The world also needs a more sustainable food system. Transformational change in food systems and land use requires the engagement of multiple actors across the full spectrum of the food system, linking actors and actions at the national, subnational, and jurisdictional scales to downstream demand and finance private sector players. The GEF's Food Systems, Land Use and Restoration Impact Program (FOLUR) takes such a holistic approach in its efforts to promote sustainable food systems to tackle negative externalities in entire value chains; remove deforestation from commercial commodity supply chains; and support large-scale restoration of degraded landscapes for sustainable production and ecosystem services.

Forest loss now accounts for about 12% of annual, global greenhouse gas emissions. Therefore, two new dedicated programs on forests and food system value chains will invest approximately $700 million of GEF resources over the next four years to tackle the key drivers of forest loss and land degradation. The Sustainable Forest Management (SFM) impact program will focus on the ecological integrity of the Amazon and the Congo Basins, and will extend much

THE GLOBAL ENVIRONMENT FACILITY AND CLIMATE CHANGE

needed attention to the world's drylands. FOLUR will focus on promoting transformative changes in the way we produce food, with the view of decoupling agricultural development from carbon-intense and environmentally damaging practices.

However successful we will be on pushing the proper mitigation actions, we will still need adaptation measures to cope with the impacts of climate change and variability. This is particularly true on issues like food and agriculture and cities, which are at the heart of the GEF's new strategy.

A key issue before us is how to manage the uncertainty of future climate scenarios. While our response will be different depending on levels of warming, it is certain that we must act now. We simply don't have the luxury to wait and see.

We must come together on planning decisions, and we must integrate mitigation and adaptation into our development strategies and sectoral investments. Only by working together will we find solutions needed to address the challenge before us.

The GEF is helping countries to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change in line with the goals of the Paris Agreement, by mainstreaming resilience and adaptation to catalyze transformation of key economic systems. The GEF supports adaptation to climate change in developing countries through the Least Developed Countries Fund (LDCF), which supports urgent, medium- and long-term adaptation needs in least developed countries, and the Special Climate Change Fund (SCCF), accessible by all developing countries. At an event on the sidelines of the UN Secretary General's Climate Summit in September, donors committed $160 million to the fund.

A critical aspect of the GEF's 2018-2022 adaptation strategy is to ensure complementarity with other finance sources, so that countries can undertake effective and harmonised resilience programming. Another strong element is the enhanced engagement with the private sector by expanding catalytic grant and non-grant investments: the GEF supports pilot investments to test new technologies, develop entrepreneurs through incubators, seed funding, and venture capital approaches. The goal is to mobilise the private sector as an agent for adaptation by supporting the mainstreaming of climate change adaptation and resilience considerations into business models and risk management capabilities.

The GEF is deploying its resources where they can be most helpful to all stakeholders—governments, businesses, communities, researchers—to accelerate climate action.

For more information on the GEF's work related to climate change, please visit:

www.thegef.org and on Twitter: **@theGEF**

A cooperative as an autonomous association of people united voluntarily promotes the satisfaction of their common economic, social and cultural needs and aspirations through a jointly owned and democratically managed enterprise.

Communities become the field of action to identify needs and establish investment priorities that guarantee improvements of collective benefit in the quality of life of people and the environment.

Hondupalma, through the elaboration of the social map and in coordination with the representatives of the surrounding communities, plans social and environmental projects by zones, directed to prioritise needs of common benefit, annually investing amounts that oscillate around US$ 1,200,000.00, thus contributing with communities and supporting local and national governments in their fight to reduce poverty.

Palmas Aceiteras de Honduras, Hondupalma/ECARA is a cooperative enterprise founded in 1982, dedicated to the production, industrialisation and commercialisation of products derived from palm.

Its main processes are extraction, refining, fractionation, butter packaging, oil and manufacture of cleaning products. It is made up of 28 farmer associations and 2 agricultural cooperatives that bring together a total of 690 members. Its brands in the market are Clavel, Del Portal and JanSur.

Hondupalma is certified in:

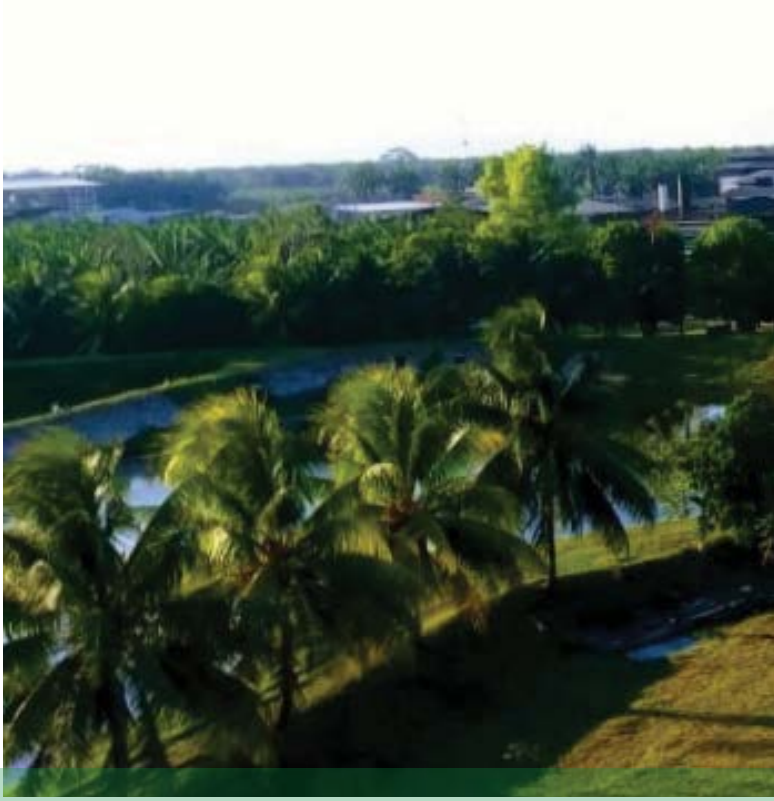
- ✓ **ISO 9001:2015** Quality Management System
- ✓ **Rainforest Alliance:** Sustainable Agriculture Network (RAS)
- ✓ **ISO 14001:2015** Environmental Management System
- ✓ **ISO 45001:2018** Occupational Health and Safety Management System
- ✓ **FSSC 22000** Food Safety Management System
- ✓ **ISCC EU e ISCC PLUS** International sustainability and carbon certification
- ✓ **Safe Company** with Safe Work
- ✓ **RSPO** Roundtable on Sustainable Palm Oil

Other Client Requirements:

- ✓ **Ethical Standards (SMETA Pillars)** Client Requirements: PEPSICO and Walmart
- ✓ **Traceability Protocol:** Required by PEPSICO

HONDUPALMA's actions to reduce climate change:

1. Wastewater treatment plant and biogas capture for the generation of clean energy.
2. Use of biomass instead of fossil fuels in boilers (with sleeve filters to reduce particulate matter), reducing GHG (Greenhouse Gasses) emissions associated with production.
3. Energy Efficiency Programme focused on reducing energy consumption and increasing the generation of clean energy.
4. Plan for the reduction of agrochemicals that emit GHGs into the environment.
5. Integral Solid Waste Management Plan.



SAP DTH Project

With the purpose of providing an integral technological solution, operative excellence and processes, based on best practices and international standards, achieving a better control of the administration of the organisation's resources; the SAP-DTH project is being finalized, which includes the following modules: Finances (FI), Costs (CO), Materials (MM), Production (PP), Quality Control (QM), Sales (SD), Maintenance (PM), Payroll (HCM), Business Intelligence (BI).

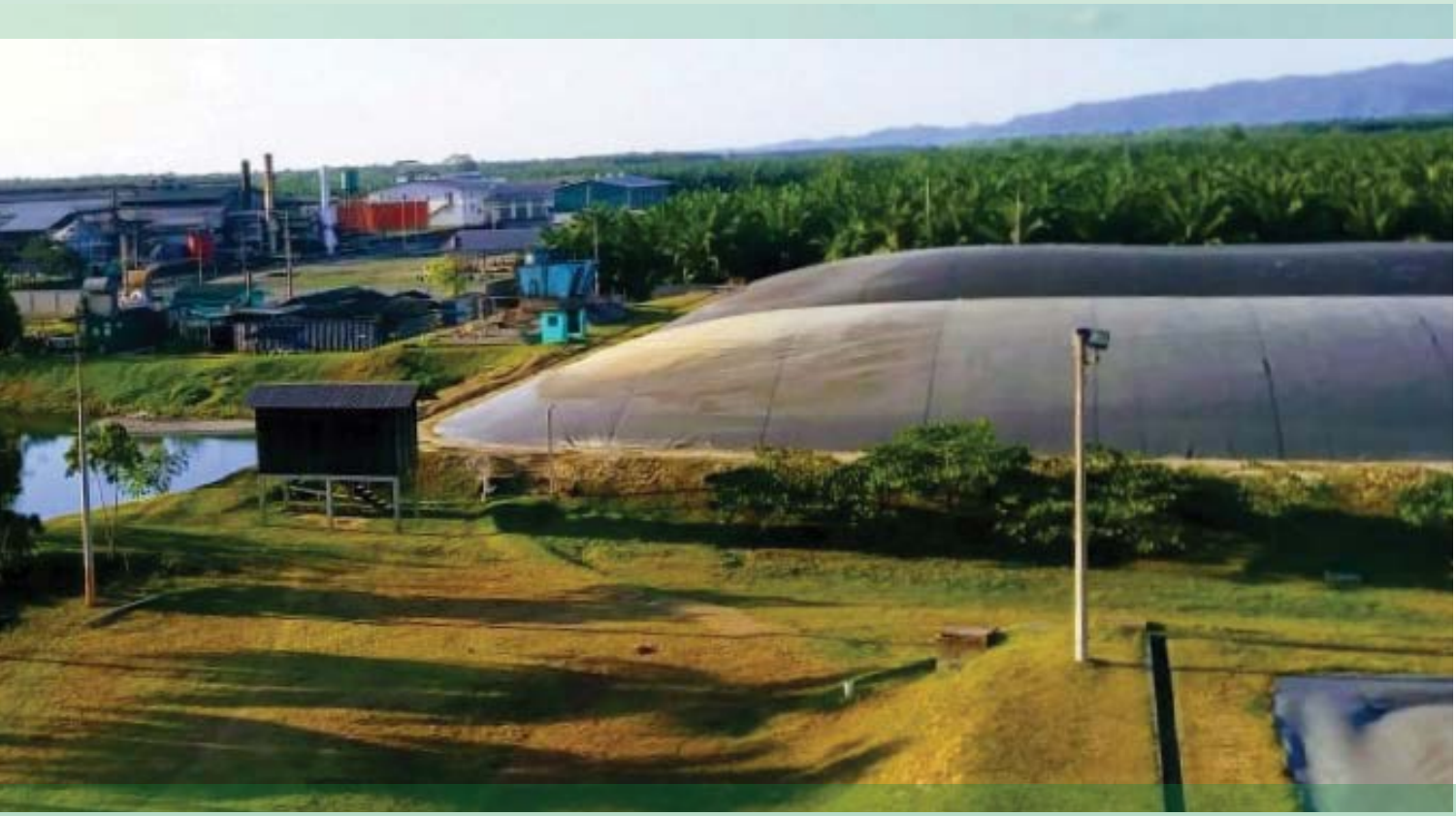
Social Projection

1. Medical Services:

Hondupalma has its own IHSS-SME clinic in which medical services are provided to partners, employees and communities in the Guaymas and surrounding areas, detailed below:

- ✓ General practitioner and nurse service
- ✓ Laboratory service
- ✓ Dentistry service
- ✓ General Pharmacy
- ✓ Ambulance service

HOW HONDUPALMA PROVIDES COLLECTIVE BENEFIT TO LOCAL COMMUNITIES AND THE ENVIRONMENT by Nelson Araya



Clean Energy Project

A symbolic price of USD 0.40 is charged for the medical consult.

This benefit is received by approximately 8,000 families.

2. Educational Services
Ernesto Ponce Vocational Technical Institute serves the educational needs of family members of associates, employees and inhabitants of nearby communities, in the following careers:

- ✓ Industrial Mechanics
- ✓ Automotive Mechanics
- ✓ Industrial Welding
- ✓ Common Basic Cycle
- ✓ Computer Technician
- ✓ Bachelor's Degree in Science and Humanities
- ✓ Technical Professional Bachelor's Degree in Accounting and Finance
- ✓ Professional Technician in Computer Science Bachelor's Degree
- ✓ Technical Professional Bachelor's Degree in Cooperativism

This benefit is received by 700 students annually.

3. Road Infrastructure
As part of the social projection Hondupalma contributes with the maintenance of streets and bridges and the construction of containment barriers for floods.

This benefit is received by 32 surrounding communities that include approximately 8,000 families.

www.hondupalmahn.com

AkzoNobel

- 11-year member of the Dow Jones Sustainability Index
- First-place ranking four of the five past years
- 50% of products now deliver sustainability benefits to customers
- 20% or more of our products deliver industry-leading sustainability benefits
- 40% renewable energy used
- 100% carbon-neutral target set for 2050

AkzoNobel

Cities across the world face new, interlinked sustainability challenges that are redefining the role of private-sector business, but progress is being made in cleansing urban environments and supporting international collaboration on pressing environmental issues, writes Pamela Phua, general director of Vietnam, decorative paints South Asia, AkzoNobel.

According to the *UN Chronicle*, energy consumption and air pollution are two of the most critical issues for the 3.5 billion people who live in urban communities. The World Health Organization calculates that nine out of 10 people around the world currently breathe unhealthy air, leading to pollution-related diseases that cause seven million deaths every year.

When it comes to energy – most of which is still generated from non-renewable sources – our cities are using more than ever before, with urban demand accounting for as much as 80% of global production. At AkzoNobel, sustainability is business and business is sustainability.

We take our responsibility to depollute the paints and coatings in our urban environment seriously, and we are committed to applying these lessons throughout the supply chain to address both energy use and air quality.

We have made an ongoing commitment to invest in sustainability, innovation and society as part of our vision for a cleaner and healthier world. The foundations of our work are built on a review of the risks and opportunities within the context of our key market segments to 2050.

This has demonstrated to us the need to leverage the latest knowledge across science and society, identify and mitigate our challenges, and develop strategies to make the future better.

For example, Southeast Asia is a market experiencing robust economic and population growth, which requires high levels of construction to meet the demands of a new middle class and rapid urbanisation. However, as our research identified, this also means that there is vast opportunity to pioneer new solutions.

Environmental targets

- **Environmental:** Achieve zero carbon emissions in our own operations; source 100% renewable energy
- **Social:** Reduce use of volatile organic compounds and substances
- **Economic:** Achieve zero waste and 100% resource productivity in our operations

A strategy for cleaner air

In all industries, environmental impact occurs throughout the manufacturing process, from R&D to the ultimate application of products.

When you look at the total carbon emissions in the supply chain, it becomes clear that the key to reducing our environmental impact is to work collaboratively.

To lead the change, we have assembled a cohort of 4,000 scientists who will work closely with our global customer base to push for new, suitable and sustainable solutions. Further, we are undertaking trials of our depolluting paint for launch in three megacities in India and Indonesia that struggle with severe pollution issues.

In our work to depollute air, we can now use photocatalysis to trigger chemical reactions. In this process, photoactive titanium dioxide absorbs sunlight and reacts with oxygen and moisture to generate highly reactive free radicals, which in turn can contribute to the abatement of noxious emissions from motor vehicles, and decompose harmful gases such as nitrogen oxide, sulphur dioxide and VOCs.

Some impacts occur beyond the scope of our processes, with our suppliers and customers. For example, in paints and

SUSTAINABILITY IS BUSINESS

“Our renewable energy supply strategy has three focus areas: to protect our current renewable share; support cost-effective, large energy ventures; and explore commercially feasible on-site renewable energy generation.”

coatings more than 98% of our carbon footprint comes from upstream (supplier) and downstream (customer) activities.

Upstream, we know that the emissions from raw materials such as pigments, resins and solvents are our greatest impact, so we have joined forces with suppliers to drive the use of bio-based materials, recycled content, or raw materials produced with renewable energy. We closely monitor the cradle-to-grave life cycle of our raw materials and finished products to reduce Volatile Organic Compounds, the impact of transportation and other environmental fallout.

Creating better energy

Energy is one of our single biggest expenditures – in some products it accounts for as much as 80% of our variable cost and such overheads directly affect our bottom line.

Our renewable energy supply strategy has three focus areas: to protect our current renewable share; support cost-effective, large energy ventures; and explore commercially feasible on-site renewable energy generation.

By investing in these areas, we are securing profitability in the long term. However, in finding cost-effective solutions, we need to identify those that can withstand the test of time.

We have leveraged the power of energy to support our sustainability programme and renewables now power 45% of our requirements, meeting our 2020 target ahead of schedule. We found that in doing this we have created direct benefits for our business by lowering costs and risk, and creating new value chains.

We draw power from solar, wind, natural gas and biomass, through multiple suppliers, meaning we can depend on an extremely reliable supply with low risk exposure to power shortages, rising oil prices or changes in carbon pricing.

For example, we are sourcing power directly from newly developed wind farms, together with Google, Philips and DSM in the Netherlands.

Adding renewables to our profile also improves the sustainability of our products, helping us retain and acquire customers and find new ways of creating value for them.

In cases of oversupply, we can use existing facilities to turn electricity into green hydrogen, which can be sold to produce chemicals or as a new product. The Dutch city of Groningen is already running a pilot with two hydrogen buses, supplied by AkzoNobel.

Renewable energy is characterised by variation in supply. As we connect more wind parks and solar panels to our national grids, these swings will only become more severe and occur more often. Companies like AkzoNobel can play an important role in balancing these swings, and can even use them to create mutual benefits.

Invested in tomorrow

Sustainability is not an afterthought, it is our way of doing business. It is woven into our DNA and is a powerful means of attracting customers.

To achieve carbon neutrality by 2050, economic, environmental and social factors are accounted for in our daily work with customers, throughout the product development lifecycle and across our operations, and we have three specific targets in place (see previous page).

More than half our products provide sustainability benefits to those who use them, but often we must also engage in leading work beyond our own organisation. We have allocated significant sums to the paints and coatings open innovation platform and a small yet innovative manufacturing acquisition in the UK. To drive the next wave of sustainable solutions, we will make a further investment in our innovation activities before the end of the current decade.

By 2020, we are targeting 20% of revenue from products that are more sustainable than those of our competitors, and up to 30% more efficient in resource and energy use across

An iconic view of Ho Chi Minh City, Vietnam

Case study: VIETNAM

Vietnam faces the challenge of sustainable development and urbanisation in a uniquely historic environment, home to many famous architectural structures. To overcome these, AkzoNobel offers a wide range of sustainable products in the local market, as well as practical support to those who live and work there.

In the first quarter of 2019, we hosted two events on urban heritage preservation, which saw 450 experts discuss a master plan for Vietnamese heritage. To support the next generation in taking over this work, we offer scholarships for architecture students and often host initiatives such as the Orange ASEAN Factory. AkzoNobel has also volunteered thousands of paints and working hours to repaint iconic structures, schools, urban alleys and old apartment buildings.

the entire value chain. We also aim to maintain eco-premium solutions at a sustainable 20% of revenue through 2020. These investments are key to long-term sustainable value creation. We know that our in-house innovation can achieve higher efficiency at lower impact, in line with our philosophy of delivering more with less.

Adding colour for the next generation

To ensure the best ideas are developed for the benefit of future generations, we must seek out and promote diversity of thought – and that can only be done by collaborating with diverse teams.

To drive the paints and coatings industry through its next phase of modernisation, we at AkzoNobel have created a new ecosystem for innovation by launching Paint the Future, an innovation challenge with an open invitation to collaborate and turn exciting potential into brilliant reality.

This year, we will combine our global reach with the agility of thought present across the global start-up and scale-up environment, to push the boundaries of what our industry can achieve.

The aim is to connect disruptive technologies to accelerate the dynamic world of paints and coatings, based on five pillars: smart application, enhanced functionality, circular solutions, life science infusion and predictable performance.

In the first round, 1,150 members submitted 158 ideas: from turning waste into bio-oils and minerals to using bio-based methods to capture and convert the carbon dioxide from steelworks. Other ideas used renewable and long-lasting dyes from biomass and self-cleaning, air-purifying coatings.

Twenty-one outstanding start-ups were selected for the accelerator programme.

Now concluded, SAS Nanotechnologies (from the US), QLayers (Netherlands), Interface Polymers (UK), Apellix (US) and Alucha Recycling Technologies (Netherlands) were rewarded by AkzoNobel, while Octo (the Netherlands) took home the KPMG Scale-up Award.

We are committed to continued work with the recipients of these prizes, to pursue sustainable business opportunities through joint collaboration agreements.

In March this year, we launched AkzoNobel Cares, an amalgamation of our social programmes, including the Community Programme, Let's Colour, Community with many repainting projects, and the Education Fund, as well as smaller local activities.

Throughout this work, we aim to deliver shared value by helping communities, strengthening our reputation and building the pride our team members hold in the company.

www.akzonobel.com

Pamela Phua, General director of Vietnam, decorative paints South Asia, AkzoNobel

In 2017, Pamela Phua was appointed as Cluster General Director of Vietnam, Singapore and Indochina, Decorative Paints South Asia. With 20 years of experience in the coatings industry, she has driven the business with new technology development and product implementation across the region, especially in the Vietnamese market.

Phua was instrumental in setting up the global research and laboratory operations for AkzoNobel Decorative Paints (Global Exterior Wall Paint Expertise Group) in 2011. In her global capacity, Pamela implements the functional and production innovation strategy for exterior wall paint. She spearheads the RD&I functional excellence, standards and capability, and the efficient delivery of processes as the approved standards and processes across the globe.

Together with a special passion for sustainable development, she has led her teams to innovate painting products and solutions through increasingly sustainable benefits for AkzoNobel customers and the environment. She also actively gets involved in sustainable activities in projects to create inspiring living spaces for local communities and to promote green architecture trends.

e: pamela.phua@akzonobel.com

GLOBAL ENVIRONMENT FACILITY

INVESTING IN OUR PLANET

"Our only chance is to shift the world to a different investment and growth path. We need a new growth story for the 21st century, and for that we must fundamentally transform our food, urban, and energy systems, and move to a circular economy."

Naoko Ishii,
CEO and Chairperson of the Global Environment Facility (GEF)

ENAEX

With 98 years of experience in the explosives industry, Enaex is positioned as the business partner of various global blue-chip mining companies. Recognised as the most important Latin-American rock fragmentation service supplier, with one of the largest ammonium nitrate production complexes worldwide. Enaex has a global presence, a solid financial position, low debt levels and is controlled by Sigdo Koppers Group.

Enaex – Customer-Driven

Ammonium nitrate (AN) is a natural-based chemical used in the mining industry as a blasting agent. Enaex is the only local producer in Chile with a capacity of 800,000 tons per year, increasing manufacturing capability by 34,000 tons per year during 2018 with the acquisition of Industrias Cachimayo in Peru, serving as the logistic hub for local and international sales of AN as a raw material for the production of several types of explosives.

With a clear vision of delivering premium solutions in key mining regions globally, internationalisation was consolidated in 2015 through Davey Bickford and Britanite acquisitions. Industrias Químicas IBQ (Britanite), is the leader in the civil explosive and blasting service market in Brazil, with over 50 years of experience in the explosives industry and initiation systems production. Davey Bickford is a renowned international leader in Electronic Initiation Systems for the mining industry, with almost 200 years of experience and international presence, with production and R&D capacities in France.

The company was founded in 1920, starting AN production in the 80s, with Prillex América plant construction in Mejillones, to enable self-supply of this explosives main raw material. In the 90s, once Sigdo Koppers took control of Enaex, their experience as a worldwide comprehensive supplier of products and services for the mining and industrial operations conglomerate led to expansion of nitric acid and AN production.

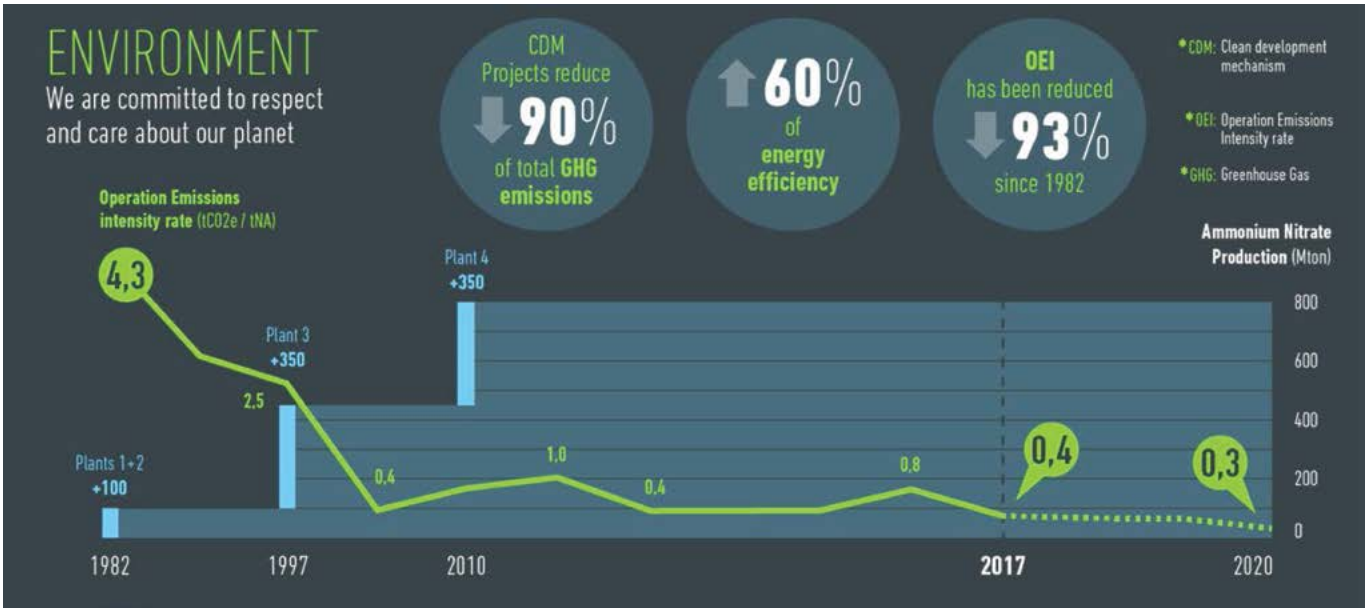
As a result of Clean Development Mechanism (CDM) projects implemented in Prillex plant, within Panna3 and Panna4 operations, nitrous oxide (N2O) emissions, typical of the production of nitric acid, have been significantly reduced. These projects can reduce more than 90% of potential total emissions, reaching up to 1 million tCO2eq annually. Each year 50% of these emissions reductions are verified and certified by the United Nations Framework Convention on Climate Change (UNFCCC) and issued as carbon credits, which can be sold as offsets in the EU carbon market.

The CDM, born from the Kyoto Protocol in 2005, has allowed Enaex to grow in a sustainable way with low carbon ammonium nitrate production. Since 2009, Enaex has calculated its corporate carbon footprint in order to understand both the magnitude of greenhouse gas (GHG) emissions generated by its production processes and the opportunities to reduce these emissions and optimise operations.

In Chile, Enaex is recognised as a leading company in climate change management, representing 22% of the 22.3 million CERs issued to Chilean corporations since 2006. The Chilean Ministry of Mining named them the "Chilean Company that Best Represents the Mining Industry", according to Juan Andres Errázuriz, Enaex CEO.

The company increased electrical self-sufficiency by 60% at Prillex complex by using surplus steam to replace energy from the grid, which is not only a net saving in operating costs but also partial independence from the SING.

Today, all of the above represent a carbon footprint 40% lower than the same process under standard conditions; achieving, in addition, disconnection of the relation between emissions and productive processes as can be seen in the chart below.



REDUCING MINING'S CARBON FOOTPRINT WITH HIGH STANDARDS AND COMMUNITY ENGAGEMENT

Prillex plant

In Peru, Enaex is producing green AN in Industrias Cachimayo, as nitric acid and ammonia production is triggered through water electrolysis, using electrical energy generated in Machu Picchu hydroelectric plant. Through water electrolysis, the plant is designed to produce 50 tons per day of liquid ammonia. In its continuous improvement efforts, Enaex is currently evaluating diverse projects to achieve greener production, from which the green emulsion lines with 120,000 tons per year for line1 and 240,000 tons per year in line2 capacities for 2019 in Peru. In Chile, Enaex is also targeting the self-supply of green ammonia for the Prillex plant, in the figure above. The green ammonia would be produced locally, based on green hydrogen generated by local renewable power sources.

Out in the community and due to the nature of its business, the company holds regular meetings to gather feedback about the impact they are having locally. That information is relayed back to the company's steering committee, led by Enaex's CEO. The committee seriously considers the community's suggestions for positive improvement.

Improved quantity and quality of education is a constructive impact the company aspires to have on its communities. Throughout 2018, the Prillex and Rio Loa plant offered internships for 12 and 20 local students respectively, with the possibility of full-time employment for high-potential students. "One of the company's social commitments is to provide ongoing support for education and technical-professional training in the community," states Edmundo Jimenez, Enaex Latam West VP.

enaex.com

STATKRAFT

Statkraft is a leading international company in hydroelectric power generation and the largest generator of renewable energy in Europe. The group produces hydroelectric, wind, solar energy and supplies district heating. Statkraft is a leading company in energy market management and has 3,600 employees across 16 countries.

Statkraft

Energy systems around the world are changing, and they are changing at a rapid pace. Globally, wind and solar power are being developed on a scale that we have never seen before and there is still much more to come. As this enormous growth unfolds, the need to be more flexible increases.

The decrease in energy costs has certainly changed the power generation scenario and has encouraged an ever-increasing public interest in renewable energy.

Access to clean energy makes electricity from renewable sources an increasingly effective solution to the enormous challenge of fighting climate change. This is of utmost importance given that 75% of global emissions are related to energy.

All these changes represent challenges but also significant opportunities for those who are able to adapt. During our 120-year history we have faced enormous changes. And this current change is one that we meet with optimism and high expectations. A demonstration of this is our current strategic ramp up of solar, wind and hydropower project investment in South America, Europe and India.

Chile and its enormous potential

Although most of the energy used in Chile uses fossil fuels as a base, the eyes of the world are on the special conditions that Chile has to contribute to the development of renewable energies. These conditions have led to an increased input of renewable energy to the Chilean power system over recent years. As an example, in 2018 alone more than 46% of Chile's installed power was generated by natural resources.

From Europe, Statkraft predicted that potential and in 2014 decided to commence operations in this country. Today, the company owns 50% of La Higuera and La Confluencia Hydro Power Plants, Rucatayo Hydro Power Plant and is currently constructing Los Lagos Hydro Power Plant. The company recently announced the purchase of three wind projects in the central zone of Chile and is actively seeking new opportunities for growth in clean renewable energy.

With the strongest solar radiation in the world, robust northerly winds and invaluable water resources, Chile is set to become a world power in clean energy, which is the fundamental basis for a green future.

And at Statkraft, we want to champion this revolution. Given that clean energy is a basic condition for a modern society and the most powerful tool to fight against climate change, Statkraft is committed to develop the energy sources for a low-carbon future.

Statkraft Chile

www.statkraft.com

www.statkraft.cl

STATKRAFT CHILE
COMMITTED TO SUSTAINABLE DEVELOPMENT

SKRETTING

Skretting is the global leader in providing innovative and sustainable nutritional solutions for the aquaculture industry. It has production facilities in 19 countries, employs 3,500 people, and manufactures and delivers high quality feeds from hatching to harvest for more than 60 species. In 2018, Skretting produced 2.3 million tonnes of aquaculture feeds. Its head office is in Stavanger, Norway.

SKRETTING
a Nutreco company

Aquaculture is critical to global nutritional security. Commercial fishing can only meet so much of our seafood requirements. In most cases, capture fisheries have long lingered at or above their maximum sustainable yield – providing a combined 93 million tonnes. At the same time, climate change is increasingly contributing to the decline of fish and shellfish biomass. Therefore the onus is on aquaculture to supply progressively larger volumes to fill the void.

Photo credit Skretting.

Fortunately, it has been rising to the challenge. Indeed aquaculture is one of the food sector's greatest success stories of recent decades, with the human consumption of farmed fish and shrimp first eclipsing products from wild fisheries some four years ago. To give some context, in 1974, aquaculture's contribution to world seafood consumption was just 7%. And, according to the Food and Agriculture Organization of the United Nations (FAO), the output continues to grow faster than any other major food supply sector. By 2030 it's expected to provide 60% of the seafood that the human race consumes. A key reason for aquaculture's incredible momentum is that most of what it produces is destined for human consumption – in all, some 580 species or aquatic species groups. At the same time, it's the most efficient protein generator – converting more feed into edible product than other farmed animals. Such progress has made a massive contribution to the global fish supply, which the FAO now estimates at a record 20kg per capita.

Increasing availability

Much of aquaculture's expansion can be attributed to a thriving feed sector – a hotbed of innovation that's particularly adept to overcoming potential boundaries. In this regard, a principal endeavour is the reduced dependence on fishmeal and fish oil. While these are among the most nutritious and digestible ingredients for aquaculture feeds and species, in coming from wild-capture fisheries, they're also finite resources, with availability and prices that are prone to dramatic fluctuations. In 2010, through its own focus on this particular challenge, Skretting introduced its MicroBalance concept. This groundbreaking technology led to the creation of aquafeeds independent of marine raw materials but which still provide optimised fish growth and health.

Fast forward to today, and Skretting remains at the forefront of the sector – providing a number of pioneering fish farmers with feeds that contain no fishmeal or fish oil, while also working with value chain partners to establish their commercial viability.

Skretting community development projects in Zambia. Photo credit Skretting.

HOW AQUACULTURE FEEDS CONTRIBUTE TO FEEDING THE FUTURE

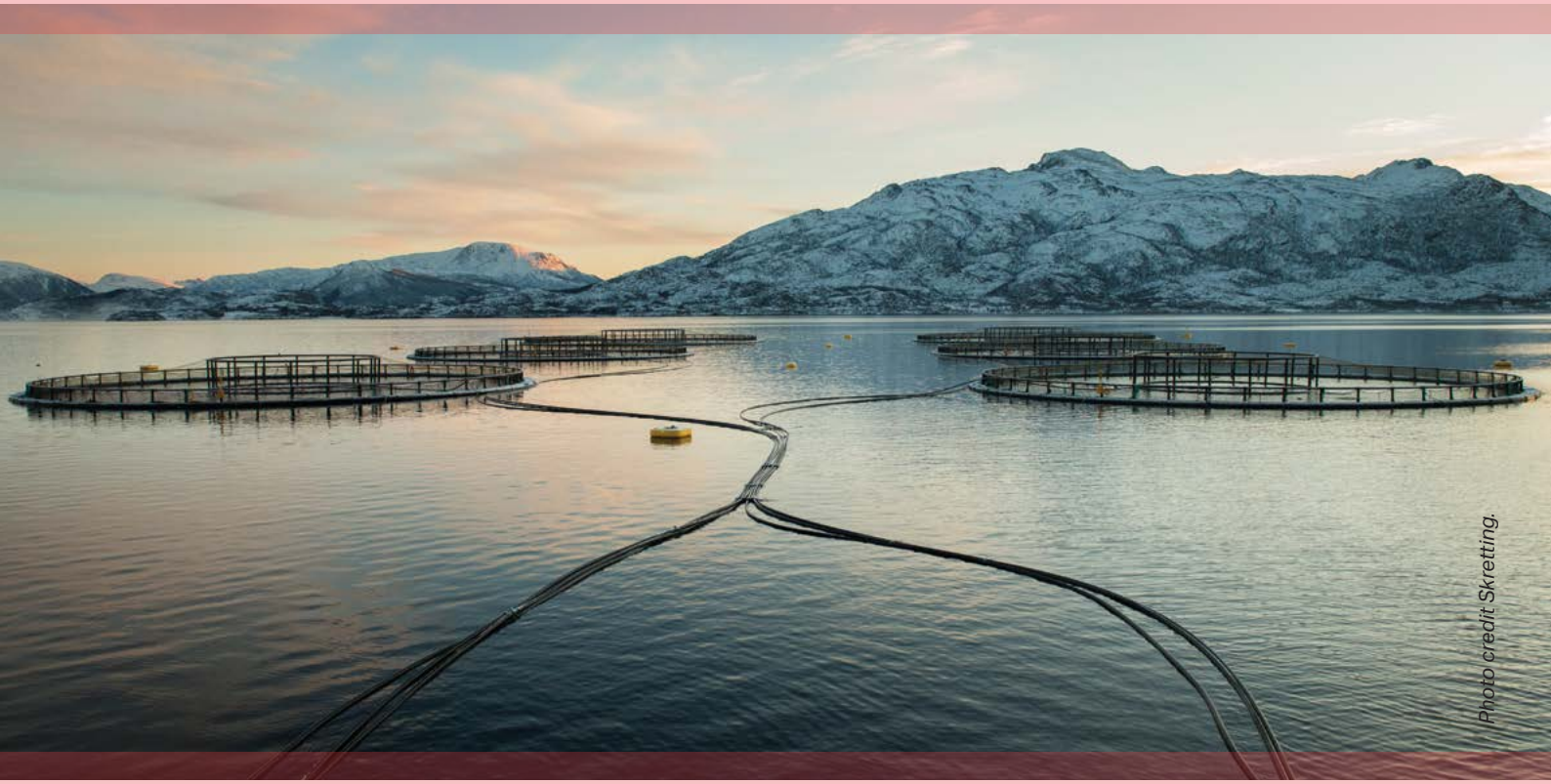


Photo credit Skretting.

Skretting is also a lead partner in the new FEED-X programme that aims to remove the barriers to sustainably fed, affordable food by 2030 through the sourcing, testing, financing and scaling-up of alternative ingredients into the global feed industry, starting with aquaculture. To date, most emerging alternatives have fallen into three areas: algae oils containing essential long-chain omega-3 fatty acids; proteins based on different insect species; and protein from bacteria. In addition to delivering nutritional benefits and performance on par with traditional ingredients, FEED-X mandates the solutions must be available at workable prices for aquaculture operations, and that manufacturing processes cannot lead to negative environmental or social impacts.

Sharing expertise

Concurrently, Skretting has been broadening its geographical horizons. Strategically, as more regions of the world engage in responsible aquaculture production, Skretting has been on hand to ensure local farmers have all the necessary support for their production systems to succeed. All of these operations are bound by the company's global mission of 'Feeding the Future'.

Looking ahead, with the populations of some African countries forecast to expand at considerably faster rates than most other regions over the coming decades, Skretting has identified that increased aquaculture productivity at local levels will help meet the inevitable rising food needs. Last year, as part of its commitment to develop African aquaculture, Skretting signed an MOU with non-profit research organisation WorldFish that aims to understand the structure of the local industry, and then improve its farming practices. Starting with Egypt and then Zambia, the collaborative project is working with fish farmers to develop best management practices, test new technologies and raise harvests and efficiency. Crucially, results will be shared with governments and other policymakers to illustrate the benefits of improving aquaculture best-practice on a national scale.

It is through initiatives such as these that Skretting intends to support aquaculture's evolution in what is a new food world, where climate change and other megatrends are incrementally transforming the planet, including the disruption of ecosystems and supply chains," says Skretting CEO Therese Log Bergjord. "Aquaculture promises to be an increasingly prominent contributor to global food security – providing safe, healthy and delicious protein for a population that's on course to exceed 9.7 billion by 2050."

www.skretting.com

RENEWABLE ENERGY CERTIFICATES AS CORPORATE STRATEGY TO REDUCE GHGS: THE SIRIO-LIBANÊS HOSPITAL CASE IN BRAZIL

Daniel K. Ohnuma and Rodrigo V. Sluminsky

The global market has developed different ways of enabling end-user access to the renewable energy market, such as alternative contracts, green tariffs and financing, self-production and Renewable Energy Certificates. They have emerged as a mechanism to track and document the origin of the energy generated through the identification of their attributes[1].

Daniel K. Ohnuma *Rodrigo V. Sluminsky*

Certificates may be purchased independently or bundled into PPAs. Energy attributes from different sources or technologies can be certified. The clean energy is linked to a Certificate by the allocation of its attributes[2]. End users might consume unbundled energy, nonetheless they cannot claim rights to green attributes anymore.

In Europe, the EECS regulates the issuance of certificates through Guarantees of Origin (GOs). In the United States, people match all environmental energy attributes to Renewable Energy Certificates (RECs), including source, technology and emission factor[3]. According to the AIB, Certificates might be used to support claims from all players, e.g., as evidence of energy supply, condition for financing or environmental credentials[4].

The challenge is to ensure accuracy, exclusivity and applicability based on the principles of GHG Protocol, which allows consideration of zero emission in their activities. RECS International indicates that last year up to 700TWh in GOs were issued in Europe. In the United States, RECs' market steadily grows every year (16% in 2017), totaling 400TWh[5].

In Asia, Africa and most of South America, the official system is the International Renewable Energy Certificate Standard (I-REC). In Brazil, it is also possible to adopt the Brazilian Renewable Energy Certification Program (REC Brazil), with even more restrictive attributes. I-REC and REC Brazil certification models are interdependent and use the same platform[6].

Currently, there are 104 certified projects by I-REC in Brazil: 75 wind projects; 15 hydroelectric power plants; 11 solar complexes and 3 biomass plants. It means around 1,3 GW in Certificates, much far less than other markets[7].

The Sirio-Libanês Hospital is one of the largest international health references in Brazil and in the world. Founded in 1921, the Hospital helps annually more than 120,000 patients. There are 7 service units, teaching and research centers and more than 40 specialties. The main hospital complex has 710 beds occupying a built area of approximately 100,000m^2 in the city of São Paulo, Brazil[8].

The Hospital has a permanent commitment to sustainability and annually publicize its Emissions Inventory in the Brazilian GHG Protocol Program. In 2018, 9,041 tCO2 were issued, of which 3,029 tCO2 due to the energy consumption. The Hospital purchases energy in the free market, only part can be used to neutralize or reduce its carbon emissions.

In 2019 the Hospital decides to higher standards. They had set a 15% annual GHG emission reduction target and decided to purchase RECs to meet its target for emissions. Based on its annual target, the Hospital needed to reduce approximately 1,356 tCO2e, equivalent to the purchase of 18,577 MWh/year in Certificates, due to national emission factor of 0.073 tCO2e/MWh[9]. This represents up to 45% of the total energy to be consumed by the Hospital.

Many corporations around the world have considered renewable energy as main strategy to reduce emissions. A shift in the energy matrix to a low carbon economy is important to hold the increase in the global average temperature to well below 2 degrees Celsius.

In this context, Certificates can work as an excellent mechanism to drive the implementation of renewable energy projects while companies improve their standards of corporate governance and commitment to sustainability.

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CLIMATE CHANGE LITIGATION WILL REINFORCE BRAZIL'S COMMITMENT TO THE PARIS AGREEMENT

Maria João Pereira Carreira Rolim and Ana Paula Chagas

The Intergovernmental Panel on Climate Change (IPCC) recently published its special report on climate change and land[1] in which it warns that humankind must alter the way land has been used to fight climate change.

According to this report, all the current developments in the energy sector to combat climate change will not be enough, since land use is responsible for 10% of all greenhouse gas emissions and food waste makes a 30% emissions contribution.

It is undeniable that climate change effects are felt throughout the world and those who are most vulnerable to these effects are the ones who have contributed the least to it. This has raised questions about climate justice and over the past years we have witnessed the increase of climate change litigation across the globe.

According to IBA Climate Change Justice and Human Rights Task Force[2], climate change justice is a concept that recognises climate change will disproportionately affect people who have less ability to prevent, adapt to or otherwise respond to increasingly extreme weather events, rising sea levels and new resource constraints.

We have seen an increase in litigation cases across the globe with important decisions such as the Urgenda Case[3] where the Hague Court of Appeal recognised the existence of a "duty of care" that makes governments accountable for their climate action on the basis of human rights.

International environmental standards, which are supported by scientific evidence (IPCC reports) as well as being endorsed by international agreements (Paris Agreement) and the Parties' decisions, were used by the Hague Court of Appeal to define the standard of the State's human rights obligation[4].

Governments have to be accountable for their inaction in climate change issues and human rights obligations may provide the legal basis for claims against states for inadequate climate protection since the "duty of care" obliges them to achieve long-term emissions reduction targets.

From Brazil's perspective, climate change litigation is not yet relevant and most court cases are held under environmental or human rights cases. The climate change aspect has not been used as the central plea, rather it has been used as just one of countless arguments within the case.

Just after the elections, the President of Brazil gave to the Brazilian press some declarations: that Brazil could leave

Maria João Pereira Carreira Rolim

Ana Paula Chagas

the Paris Agreement and that the country probably will not be able to comply with its NDC commitments until 2030. This circumstance opens up the possibility for climate change litigation on the grounds of the Urgenda Case, which could become a very important instrument to oblige the government to implement policies that achieve the goals of avoiding a greater increase of global temperature.

Besides this, Article 225 of our Federal Constitution reinforces the "duty of care," since it recognises explicitly that all have the right to an ecologically balanced environment and to a healthy quality of life.

The Brazilian government's position could be interpreted as a failure to implement the necessary actions to combat climate change, and even a consideration of decreasing ambitions regarding its NDCs. Since we are almost reaching a point of no return, climate change litigation may be seen as the last resource available to protect our right to a healthy environment.

www.rolimvlc.com

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ENERGY DEVELOPMENT CORPORATION

EDC is a world leader in geothermal technology and the Philippines' largest 100% renewable energy (RE) company, operating 1,181 MW of geothermal, 150 MW of wind, 132 MW of hydroelectric power, and 12 MW of solar totalling 1,475 MW, which accounts for 21% of the country's total installed RE.

energy
DEVELOPMENT CORPORATION

The heat is on and we don't like it.

Everyone and everything is threatened by this worsening climate.

Scientists revealed that the world will just keep getting hotter, increasing by 3C to 6C by 2050 if nothing is done to remove greenhouse gases from the atmosphere now.

In the Philippines, which is one of the countries most vulnerable to climate change, the company's parent conglomerate of First Philippine Holdings (FPH) made a brave decision not to invest in coal after its biggest geothermal facility was badly hit by super typhoon "Haiyan" in 2013.

"These are extraordinary times that call for extraordinary change and everyone must shift to thinking about the quickest route to a decarbonised economy," said FPH Chairman and CEO Federico R. Lopez.

Operating in a country that is still primarily powered by coal, the commitment is an uphill battle for FPH but its renewable energy arm, Energy Development Corporation (EDC), has managed to be the Philippines' beacon of hope for a low-carbon economy by sustainably generating power from geothermal for over 40 years.

Geothermal, which is energy generated from the Earth's heat, is considered the Holy Grail among RE sources, being the only one that provides clean and reliable baseload power, rain or shine, day or night, all year round. Hence, EDC refers to it as "Geo 24/7."

Greening legacy

What makes the Philippines' water-based Geo 24/7 even more advantageous to Mother Earth is its need for lush forests to sustain the geothermal reservoir.

While the company's social forestry program has been providing incentives to farmers from its partner communities who helped maintain its watersheds since the 1980s, EDC took a big leap in managing its geothermal reservations in 2008 by applying a science-based approach to bridging forest gaps through the BINHI program.

A Filipino term for germling, BINHI is the company's forest restoration program, which uses 96 threatened indigenous tree species identified, collected, and propagated by EDC.

Climate action through carbon-negative operations

EDC's BINHI-led forest protection and restoration initiatives captures 3.96 million tons of carbon dioxide (CO_2) each year, on top of its avoided 7.8 million tons of CO_2 as a result of its power generation from 100% RE sources in 2018. This makes EDC carbon-negative with its carbon emissions fully absorbed by nearby forests, leaving an excess storage capacity of 3 million tons of CO_2.

Geo 24/7 clearly shows harmony among people, energy, and environment, which EDC has been demonstrating since it began operating in 1976 by pioneering best practices aligned with the UN's Sustainable Development Goals (SDGs). These include ensuring access to affordable, reliable, and sustainable energy (SDG 7), taking climate action (SDG 13), preserving life on land (SDG 15), and fighting hunger and poverty (SDGs 1-2).

POWERED BY GEO 24/7
HARNESSING EARTH'S HEAT TO CURB GLOBAL WARMING

Palinpinon Geothermal Power Plant - Philippines.

Fully charged with Geo 24/7

While its vision of having a country that is sustainably powered by RE has yet to be achieved, EDC has been making headway in assuring energy security in major regions of the country, providing the needed regulating reserve capacity to the grid with the influx of intermittent capacity from other RE sources.

EDC's experience attests to Geo 24/7's capacity to provide clean reliable baseload power to the Philippines and in any country blessed with geothermal resources like Chile, Peru and Indonesia where it has concessions.

Though geothermal energy is still less known in the country, Chile's commitment to go for more RE until 2050 could pave the way for more geothermal explorations through the expert assistance of EDC, which is currently pursuing development activities in Mariposa, including the Environmental Impact Assessment for the project and technical studies for the front-end engineering design (FEED) for the steam field, power plant, and transmission line interconnection. Through its Mariposa Geothermal Project in Chile, EDC is committed to contributing to Chile's development model for a transformative path towards a sustainable world.

www.energy.com.ph

EUROPE WILL SUPPORT CLIMATE ACTION FROM SPACE

A new satellite constellation is set to provide global carbon dioxide emission monitoring and support progress towards the Paris Agreement goals.

A new satellite mission due to launch in 2025 will feed the first global system for tracking carbon dioxide emissions from fossil fuel combustion. It will equip countries with the information they need to decarbonise their economies in order to meet their Paris Agreement commitments.

Planning for the new Copernicus anthropogenic CO2 monitoring mission - dubbed CO2M - is at an advanced stage. It is being developed jointly by ESA, the European Commission, EUMETSAT and ECMWF, with funds subject to budgetary approval. The mission is intended to support, among others, the global stocktake, a mechanism under Article 14 of the Paris Agreement for assessing each country's progress towards cutting emissions and reviewing targets that will need to be assessed every five years.

Accurate and detailed information on concentrations and emissions of greenhouse gases is becoming increasingly urgent. Global average temperatures have already warmed by around 1C since pre-industrial times. The Arctic is undergoing a faster transition to a warmer climate, with annual warming two to three times higher than the global average. Levels of atmospheric CO2 – which after atmospheric water vapour makes the biggest contribution to the greenhouse gas effect – reached a record 418 parts per million (ppm) in 2018 and is anticipated to continue to rise.

Once in orbit, the mission's satellites will carry several spectrometers measuring in the visible, and near- and shortwave-infrared spectral ranges, and additionally sensors for measuring clouds and aerosol, which will allow for retrieving accurate images of anthropogenic CO2. The capability of distinguishing between naturally-occurring emissions and those generated by burning fossil fuels will support the intense emissions-reduction efforts of the future.

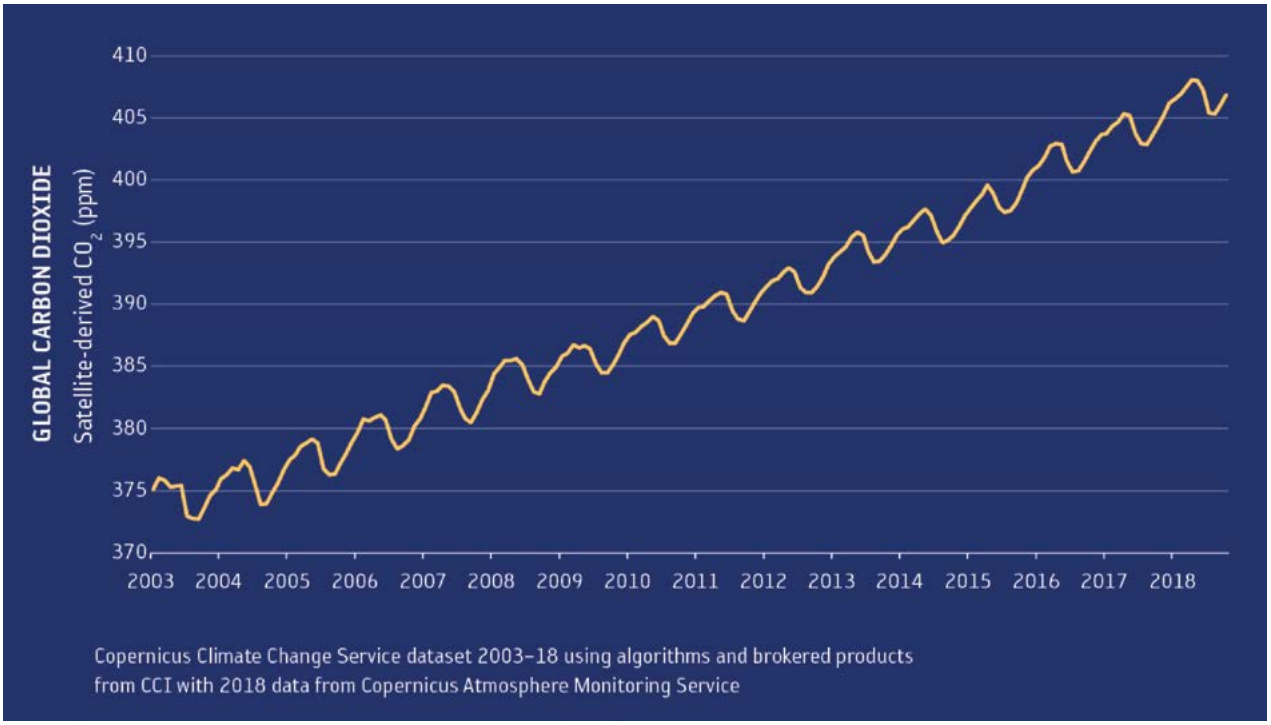
According to ESA's CO2M mission scientist Dr Yasjka Meijer, who is involved in detailing the new satellite's specifications, the mission will deliver data at a scale and accuracy that allow carbon dioxide emissions to be traced from continental, to country, to sub-national scales, "and will even identify sources from cities or even single sources such as power stations." The satellite's capability of also measuring the co-emitted NO2 supports the discrimination of individual plumes.

He adds that, "existing satellites give a relatively sparse view of global CO2 and so don't usefully inform the impact of emissions reduction policies at a national level."

By contrast, CO2M will provide a global view with sufficient accuracy to capture plumes from individual sources. Its satellites, with a swath of 250 kilometres, will be able to provide 250 data points per second. This enables the constellation to scan the entire planet every two to three days.

This improved capability is set to both enable countries to assess progress towards their 2030 national emissions reduction targets as part of the Paris Agreement, as well

The new CO2M of the European Copernicus programme will monitor man-made carbon dioxide from space and reveal its emission sources.



EUROPEAN SPACE AGENCY (ESA)

The European Space Agency (ESA) is an intergovernmental organisation with the mission to shape the development of Europe's space capability and ensure that investment in space delivers benefits to the citizens of Europe and the world. ESA develops the launchers, spacecraft and ground facilities needed to keep Europe at the forefront of global space activities. ESA is working in particular with the EU on implementing the Galileo and Copernicus programmes as well as with EUMETSAT for the development of meteorological missions.

as judge the impact of policy measures to reduce our dependence on fossil fuels, such as switching energy sources or implementing congestion charging.

Dr Meijer adds, "the data are independent and will act as a useful cross-check, adding greater confidence with measurements in national emissions inventories."

Being publicly available, there will also be an added layer of transparency and accountability that is anticipated to encourage best practice.

Data from CO2M is expected to be collected on an operational basis from 2026 onwards, in time to inform the 2028 global stocktake.

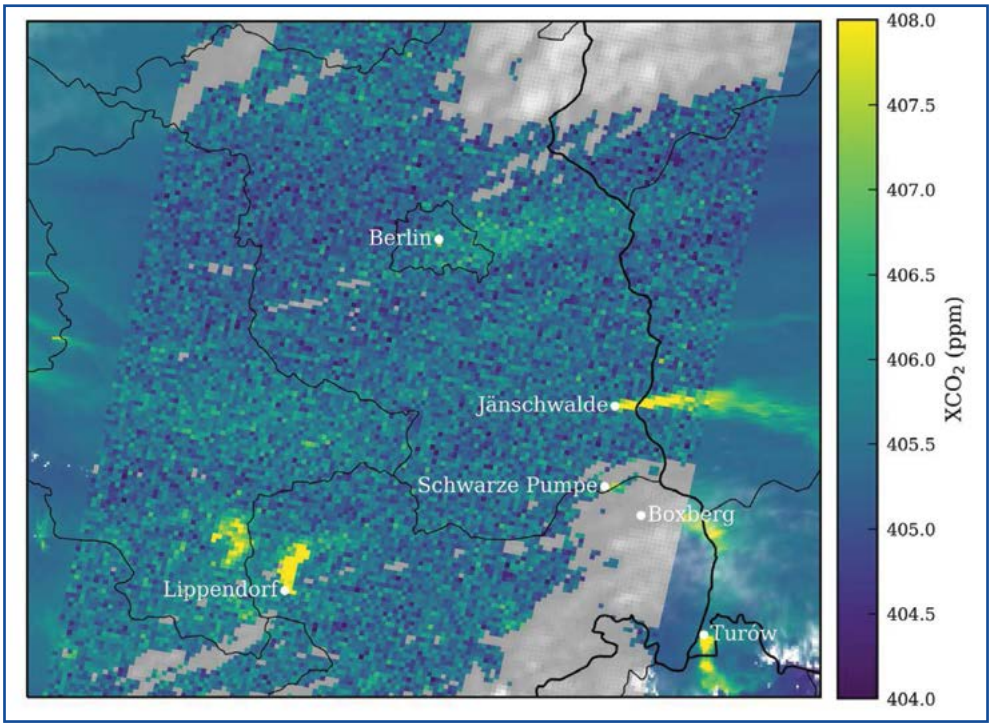
Satellite observations collected by ESA and its Member States over the past four decades have played a pivotal role in advancing the scientific understanding of climate. Through the ESA Climate Change Initiative, long-term and unified records of Essential Climate Variables provide a whole-globe view of the climate. These time series of climate variables such as sea-level rise, melting glaciers and changing polar ice sheets have supported the IPCC in its summary statements, including the recent special report on oceans and cryosphere.

This new mission builds on this understanding and will play a crucial role in enabling the international community to take the steps necessary to avert major climate disruption.

Carbon dioxide is on the rise. The planned ESA CO2M mission will help track progress towards Paris Agreement goals.

www.esa.int

This simulated image above north-east Germany reveals different sources from urban (Berlin) and industrial origin (lignite coal-fired power stations in Lippendorf, Jänschwalde, Boxberg and Turów over the Polish border).



THE MALWEE GROUP

The Malwee Group is one of the leading companies in Brazil. It stands out for its pioneering in the field of sustainability and currently works to achieve the goals of its 2020 Sustainability Plan. By its performance, in 2018, it came to rank among the 10 most transparent fashion brands in the world, according to the Transparency Index of Fashion (ITM). The Malwee Group has 4 manufacturing units, 5,500 employees and is present in more than 25,000 stores throughout Brazil.

GRUPOMalwee

By Lilian Taise da Silva Beduschi
Malwee Group - Sustainability Manager

The fashion world's value chain offers tangible products and garments as well as intangible products like identity, self-esteem, and a sense of belonging and glamour. However, this industry has been considered one of the most polluting. The transformation processes of raw vegetable, organic and synthetic materials of diverse origins generate significant impacts, depleting natural resources and biodiversity and emitting large loads of waste and greenhouse gases. The whole impact of this sector is intensified by the stimulation of consumption by desire, not necessity.

Into this scenario the Malwee Group, with the purpose of providing quality service and on-time delivery to its customers, has historically taken a responsible position towards people and nature. It is a company guided by this triple bottom line since its foundation.

Nowadays, with thousands of suppliers and a presence in more than 25,000 stores in Brazil, Malwee Group typifies the economic pillar. Investments in health, education and culture in surrounding communities have been promoting local social balance. Investments in more efficient industrial processes has brought recognition to environmental protection.

Malwee Park is an important symbol of environmental preservation and social investment. It was conceived of by the founder of the company in 1978, with 1.5 million square meters of green area, part of the 4.2 million preserved by the company. It has more than 35,000 tree species, 16 ponds, and free culture and leisure activities for the community. It receives more than 70,000 visitors per year.

Inspired by its past and looking toward the future of the business, in 2015 the Malwee Group launched its Strategic Sustainability Plan, a set of goals and targets to be achieved by 2020, resulting from taking a look at sustainability in business, products and operations throughout the value chain.

It was developed with the participation of 110 people in 14 multidisciplinary committees. Its guidelines establish people as agents of transformation and innovation to support the reduction of consumption of natural resources and reduction of emissions, effluents and waste. The objectives and goals

CAN FASHION BE SUSTAINABLE?

of the plan were segmented into macro-stages of the value chain, of which the following can be highlighted:

Product development: in this macro-stage one of the goals is to quantify the socio-environmental impact of products to make measurable advances. Toward this end, the company is conducting a life-cycle analysis of its products, a goal that must be achieved within the designated period. In parallel, in order to raise consumer awareness, two other goals are related to producing products with sustainable characteristics, either through raw materials or processes which should have lower environmental impact.

One of these goals is to achieve sustainability across 10% of the Malwee brand and its derivatives, Malwee Kids and Malwee Liberta. This goal was achieved, reaching 16% by the first half of 2019. The use of Recycled Polyester, cotton wool from textile waste and neon dyeing with 98% less water were some of the initiatives that made attaining this goal possible.

For processes, Malwee set a target of 70% of products being produced with some reduction in environmental impact, by increasing water reuse and using cotton produced with less impact.

Suppliers: through the verticalisation of the group, weaving, dyeing, stamping, finishing cutting and sewing, this macro-stage of the chain puts a greater focus on social issues, especially in sewing processes. The company has a social certification goal and internal auditing program of critical service providers to ensure human and labour rights. Currently 43% of its service providers are certified and 100% audited.

Industrial processes: Among the established goals, the reduction of greenhouse emissions was attained with the change of the energy matrix. This resulted in a reduction of 70% of scope 1 and 2 of the GHG protocol. The goal of a reduction in waste generation was also achieved before the deadline, with a 57% reduction of waste generated. This was achieved through the installation of an ooze dryer that reuses energy from the hot air outlet of the boilers. The reduction of electric energy consumption has not yet shown the expected evolution, even with an investment to exchange 100% of the company's lights for LED lamps. Likewise, the goal of zero residue for landfill and reduction of water consumption are still challenges.

Retail and use and post-use: The goals of these stages of the value chain are related to the consumer interface. The great challenge is to deliver the sustainability message to customers and consumers so as to raise awareness and communication, stimulate the use of their products in a timely manner, given the durability of their products. New projects such as launch capsule collections of sustainable products as well as the relaunching of jeans with using a laundry process of 5.0 - 99% less water, will allow a greater awareness of consumers around conscious consumption, and their own role in society.

The Malwee Group is aware of the challenge that lies ahead for socio-environmental issues in its value chain, but believes in its responsible performance and example. It sees its employees as agents of transformation and its sustainability plan as a milestone in directing its actions towards a more sustainable business. The achievement of the goals of this first stage will leverage new challenges that will allow us to guarantee the future of the next generations. That is the only way our business will perpetuate.

www.grupomalwee.com.br

THE OCEAN OPPORTUNITY

by Avrim Lazar, Convenor of the Global Salmon Initiative

Responsible aquaculture for healthy people and a healthy planet

Providing sustainable sources of protein is becoming ever more demanding, but under careful stewardship, the oceans represent a vital opportunity.

More than 37% of the Earth's land surface is reserved for agriculture, producing almost all of the food we eat. The IPCC's Special Report on *Climate Change and Land* (August, 2019) demonstrates how fragile and decreasingly productive that land is. Rapid and large-scale change to the food system is needed to provide nutritious food to a burgeoning global population, without further damaging natural resources.

Recommendations such as those from the EAT Lancet Report, are encouraging us to move towards a plant-based diet. However, due to socio-economic, cultural and access factors, meat will remain in people's diets. We need to consider the most sustainable and nutritious meat options, and that includes seafood.

This year's 'Blue COP' has pushed the state of oceans up the climate change agenda. The oceans cover 70% of the planet, yet provide just 5% of the protein we eat. If responsibly managed, a blue revolution can provide eco-friendly and nutritious food while alleviating pressure on land and protecting ocean biodiversity.

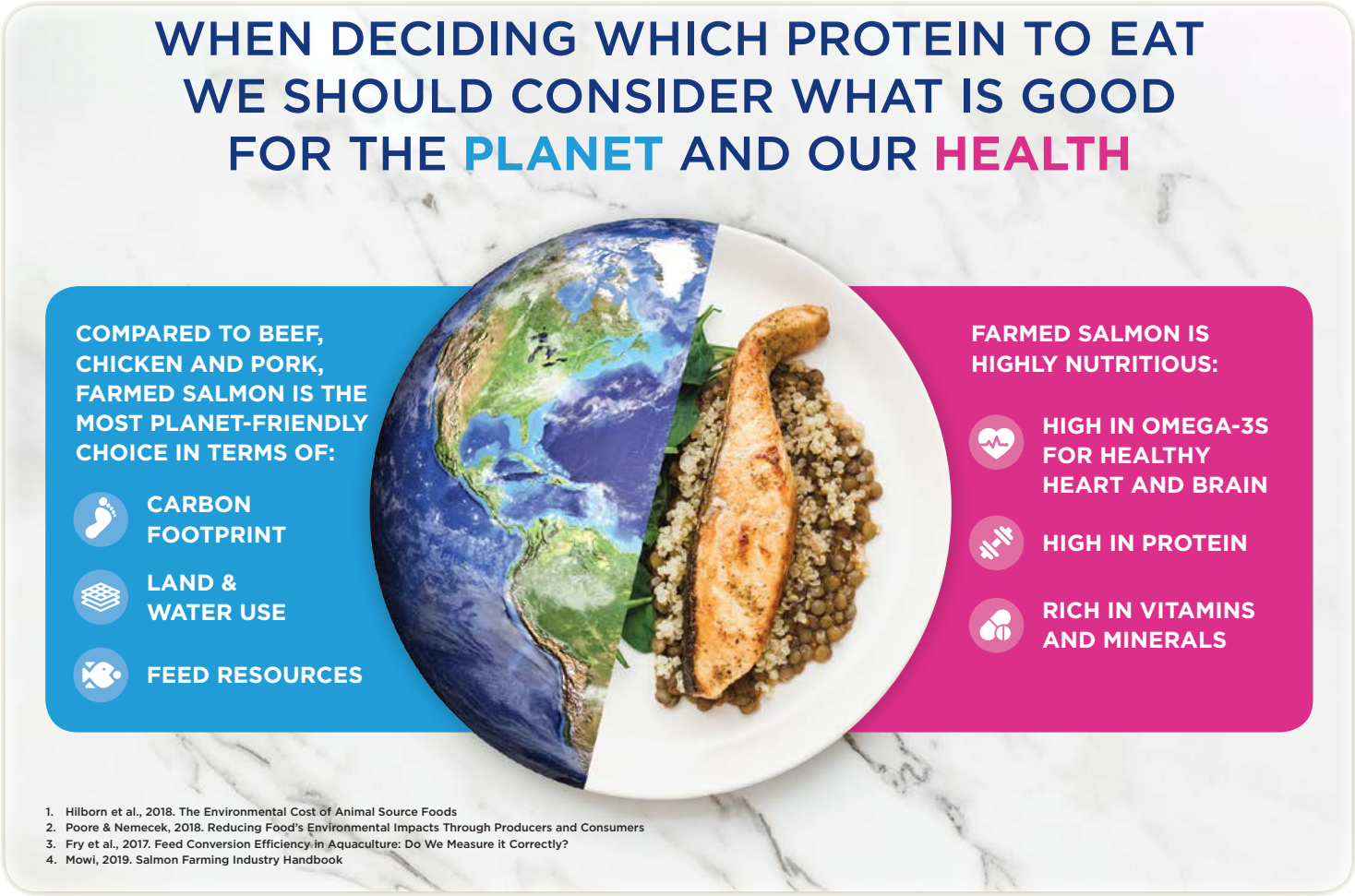
The blue revolution isn't a vision for the future; it has begun. Aquaculture provides more seafood for human consumption than wild capture, and demand is growing. If done right, aquaculture can support healthy oceans, healthy people and a healthy planet.

The most advanced form of aquaculture, salmon farming, is an industry with which this year's COP25 hosts are familiar. Chile exports salmon to over 100 markets and farmed salmon represents Chile's second largest export. The industry also provides thousands of jobs for people living in some of Chile's most remote communities.

Like all farmers, salmon producers have a duty to rear their animals responsibly. The industry recognises that if it is to expand to meet demands in a sustainable manner, a step-change decrease in environmental impact is needed. Achieving such radical change requires a new perspective on food production, and a group of salmon farmers, representing approximately half of the global industry, has been trialing a new approach.

The Global Salmon Initiative (GSI) uses collective problem-solving to drive environmental improvements across the entire industry, not just the top performers. This CEO-led change model is unlike any other in the food sector, employing a system of pre-competitive collaboration guided by four key principles: transparency, collaboration, responsibility and innovation.

GSI salmon farm in Chile



When deciding which protein to eat we should consider what is good for the planet and our health.

GSI focusses regional and global efforts on environmental and social priorities. By combining expertise from within the group as well as from NGOs, external private and public sector partners, it's easier and faster to innovate and improve.

One area where GSI's model is showing benefit is in the major shifts in efficiency and sustainability of feed. Through a focus on innovation, GSI members have and continue to substantially reduce reliance on wild fishmeal and oil in feed by incorporating novel sources such as algal oil. Farmed salmon is now one of the most resource-efficient animal proteins available. When compared to the world's favourite animal proteins (chicken, pork, beef), farmed salmon is the most climate-friendly option in terms of carbon footprint, land use and feed efficiency.

Commitment to continuous improvement is critical. The Aquaculture Stewardship Council (ASC) is the most stringent environmental certification scheme in aquaculture. Six years ago, no salmon farms could reach this standard. Today, GSI members have over 60% of their production certified.

In a changing world, systems must continuously evolve and improve. Salmon farming isn't going to solve the climate crisis, but through close collaboration between industry, private and public sector partners on the most pressing environmental challenges and opportunities, it can play a part in plugging the expanding protein gap with people- and planet-friendly food.

globalsalmoninitiative.org

@GSI_Salmon

THE GLOBAL SALMON INITIATIVE (GSI)

The Global Salmon Initiative (GSI) is a collective of companies representing >50% of the global farmed salmon industry united by a mission to improve the industry's environmental and social performance. GSI is different in that its CEO-led model of pre-competitive collaboration helps to accelerate sustainable improvements at speed and scale.

PROTECTING EAST AFRICAN TEA EXPORTS AGAINST CLIMATE CHANGE

Africa produces almost 23% of global tea exports. In particular, tea is one of the mainstay exports for Kenya and Malawi and an important economic commodity contributing 26% of Kenya's and 8% of Malawi's export earnings. Kenya is one of the top three tea exporters in the world, whose main tea export countries are Pakistan (37%), Egypt (17%) and the United Kingdom (9%). Malawi's tea crops are found in blended teas and are mainly exported to South Africa (37%), the United States (28%) and the United Kingdom (15%).

Leaves from Kenya's Rift Valley plantations are famous for their colour and taste, drawing buyers from some of the biggest tea houses like Taylors of Harrogate, Tetley, Twinings, and Unilever. Malawi's finest give good depth and a distinctive reddish colour, according to aficionados and tea blenders.

But what is the future of this important source of export income for these two countries, if climate change threatens tea growing here? Temperatures in East Africa are expected to rise, and rainfall patterns are going to be less predictable than before as the climate across the region continues to change.

Weather station records already show that temperatures have been increasing across the region for the last three decades, and rainfall is becoming less predictable with longer dry spells - a worrying trend tea farmers say is already impacting their yields.

"In a good season I might be able to harvest 600 kilograms of tea in a month," says Mary Muthoni, a smallholder tea farmer from Nyeri, about 150km north of the Kenyan capital Nairobi. "But in a drought year, I might only get 100 kilograms a month."

If conditions continue to warm, it's likely to impact both the quality and quantity of the tea, according to climate researchers. Less resilient plantations will see crops wilting or bushes dying off, which could undercut all tea exports to their all-important global tea markets.

But many tea farmers in Kenya and Malawi are already taking action, according to environmental research fellow Dr Neha Mittal from the University of Leeds' School of Earth and Environment.

"Some farmers are starting to replant their existing plantations with new strains of tea bushes that are resilient to drought and pests," she says. Farmers are also planting shade trees in hotter areas to shield bushes during extreme heat, and reforesting slopes uphill of plantations to stabilise moisture levels in soils.

Tea plantations can't move into cooler, high-altitude regions as a way of retreating from the anticipated warmer future climate, because most areas are already planted as far up the slopes as the countries' terrain allows.

"In Kenya's Rift Valley, the mountains above the tea plantations are covered with natural forests," says Mittal. "These are the country's 'water towers', which help, generate rainfall over the mountains. These have to be protected above all else."

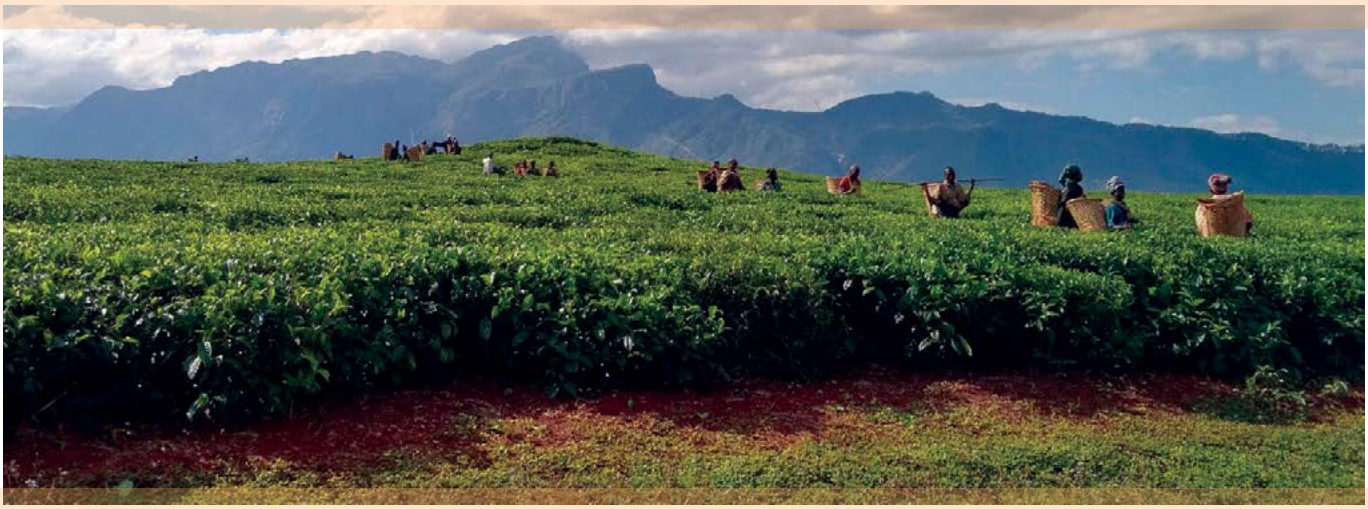
In Malawi, most tea is grown around the foothills of Mount Mulanje - essentially a giant block of rock.

Mittal and colleagues are working on a collaboration between farmers, tea research institutes, local universities, and local and international climate modellers, to help the industry plan for tea production in a hotter and less predictable future climate.

Planning for 50 years or more from now

Tea farming calls for long-term planning, according to Chikondi Katungwe, senior agronomist at the Tea Research Foundation of Central Africa (TRFCA).

"The economic life of a tea bush is about 60 years," she says. "It takes three to five years for a bush to get established, and another seven to nine years before a farmer starts to get returns." The bush should still be productive for several decades, but with the climate changing so fast, research institutes are in a race against rising temperatures to ensure they get new drought and heat resilient varieties to farmers so that they can keep adapting their plantations to be more robust.



"Droughts are getting worse in parts of the region, which has implications for the kinds of varieties being developed by the tea industry," says Mittal, "for instance, tea varieties developed in response to a 1992 drought in Malawi were still hit hard by the more severe drought in the area in 2005. As temperatures continue to rise, future droughts across the region could get worse."

Mittal is working with local smallholder farmers and bigger tea estates through the Future Climate for Africa (FCFA) programme, a cross-disciplinary group of researchers working in Africa and the United Kingdom, to provide climate information that zooms in closely on different regions, and gives detailed projections of how temperature and rainfall might change over the next half century or more.

"Most of the global climate models work at a large scale, at hundreds of square kilometres," explains Mittal, "but farmers in these different tea growing areas need information that's more local in scale. To do this, we are combining weather station observations with a number of climate models." One of the climate models used has been developed specifically for Africa, called the CP4-Africa model, and zooms in to a scale of about 4.5km by 4.5km grid. This allows climate modellers to get a better picture of local scale weather processes and likely extremes such as storm events.

The climate information this team is generating is at seasonal scale, allowing for more region-specific planning. Malawi's tea-growing period is in a four-month window (80 percent of its tea grows from December to early April) while in Kenya conditions allow tea bushes to grow all year round.

This kind of site-specific climate information means that tea growers can better understand the future climate uncertainty and change their farming management practices, according to Professor Andrew Dougill at the University of Leeds' School of Earth and Environment. This includes soil and water conservation measures, replanting with resilient tea varieties, and changing plucking methods, says Dougill.

"Already, farmers are responding by putting irrigation schemes in places, reforesting up mountain slopes to help conserve water, and putting in shade trees in more vulnerable areas," says the TRFCA's Katungwe.

The site-specific climate information can support the tea industry in East Africa to respond ahead of future climate changes and ensure their continued presence as key tea exporters globally.

For more watch the video of Future Climate for Africa's groundbreaking work documenting the impacts of climate change on tea production www.youtube.com/channel/UC0-qGXRnIHH4O8gqeS0lwUA

www.futureclimateafrica.org

CLIMATE INFORMATION FOR RESILIENT TEA PRODUCTION (CI4TEA) PROJECT

CI4Tea aims to identify key climatic characteristics that influence tea production. The project investigates various adaptation methods to support long-term planning in tea production. It builds on the work of the Future Climate For Africa research consortia HyCRISTAL and UMFULA and is led by the University of Leeds, United Kingdom.

FUTURE CLIMATE FOR AFRICA

PORTS OF PARANÁ

The Ports of Paraná are a port complex composed of the ports of Paranaguá and Antonina. Strategically located in Brazil's South 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 a static capacity of 4 million tons of grain.

PORTOS DO PARANÁ
PORT AUTHORITY

The Ports of Paraná are located in the middle of a very important and well-protected biome, known as the Atlantic Rainforest, found in the eastern part of the state of Paraná, bordered by the Atlantic Ocean. This biome has a huge natural richness and wide biodiversity that covers most of the Brazilian coast. The Ports of Paraná are inside of the Mata Atlantica Biosphere Reserve, recognised by UNESCO and, more specifically, are part of the Paranaguá Estuarine Complex, one of the largest estuaries in Brazil.

Given their position in such an important environment and understanding that human activities have effects on its surroundings, the Ports of Paraná try to minimise the most negative effects that port activities have on the environment. The main objective of the Ports of Paraná is the sustainable development of the state's coast, taking into consideration the regional mission of conservation of biodiversity and regional culture, and trying to act according to the 17 ONU millennium objectives.

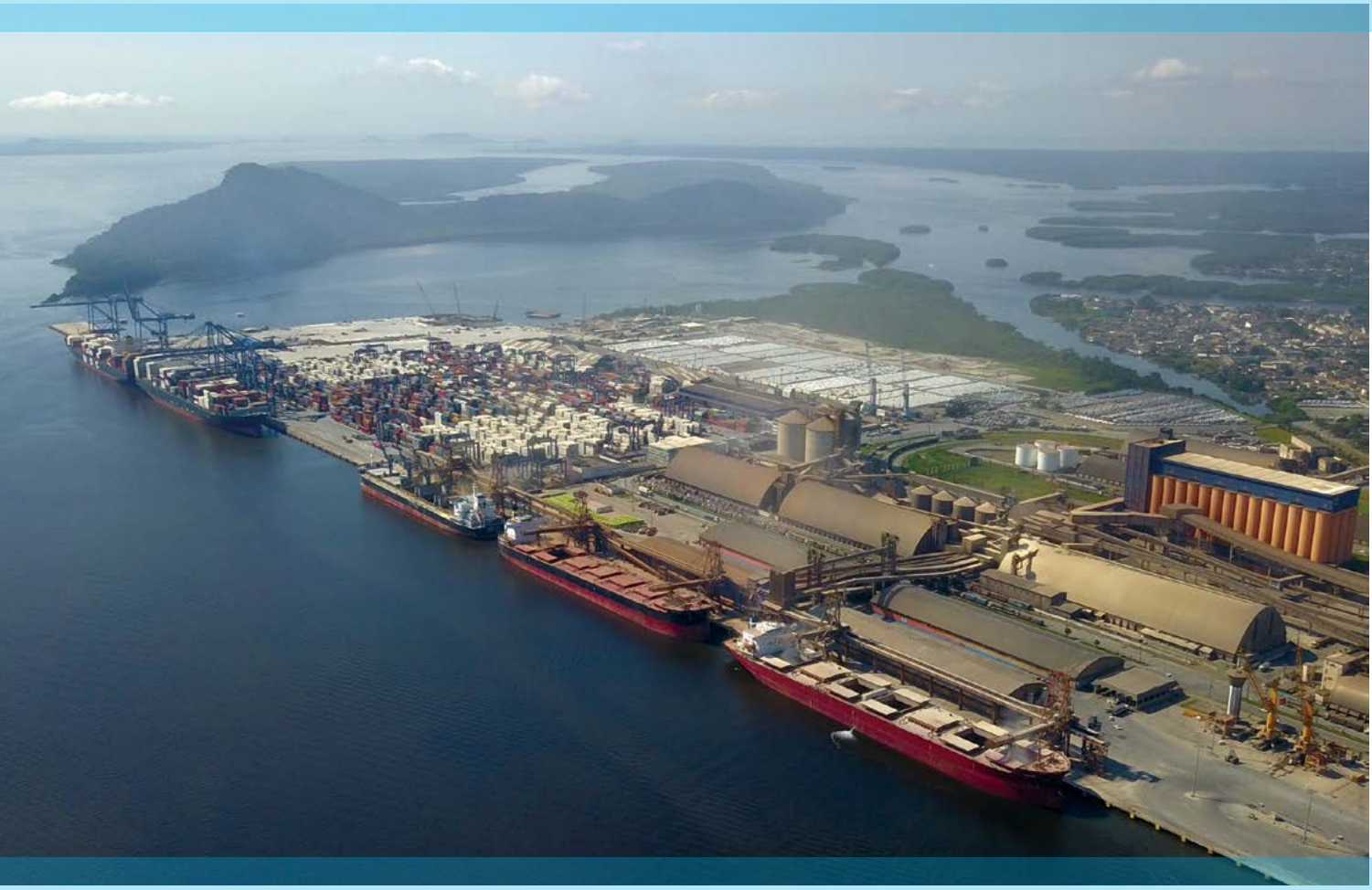
Among the largest ports in Brazil, the ports of Paraná are the best in terms of environmental performance, between the distinction granted by Brazilian Waterway Transportation Agency, given its concern and the effective actions needed to reconcile the economy environmental and development issues.

Ports of Paraná currently develop more than 40 environmental programmes focusing on environmental monitoring and conservation. Among the programs developed are the frequent monitoring of the physical and biotic environments, reaching up to 600 km² within the Paranaguá Estuarine Complex. Programmes for 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 programmes with the local communities to directly influence enterprise, involving training and workshops that focus on improving environmental quality for and quality of life of the population. The Ports of Paraná are also investing in rural infrastructure through the renovation and/or construction of small public piers in 13 island communities. Through training programmes, the Ports of Paraná implement the Degraded Areas Recovery Plan for the watersheds that flow into the Paranaguá Estuarine Complex. This deals with the recovery of agricultural environments in rural areas around the bay, especially those located in areas of permanent preservation, through the use of Agroforestry Systems that use native plant species which are of commercial interest to the population.

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 and food sovereignty to the most vulnerable populations. They plan to accomplish these actions using food and native

AIMING FOR BALANCE WITH SUSTAINABLE DEVELOPMENT ALONG BRAZIL'S COAST



species that have 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 the economic importance of the Ports of Paraná to Brazil and South America, the enterprise has projects to expand its 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 aims at the social development of the state's coast, seeking integration and balance between communities, environment, culture and economy, throughout the entire port process.

www.portosdoparana.pr.gov.br

INTERASEO GROUP

Interaseo Group is a Colombian business group that provides public water, sewage and waste management services with a presence in 57 municipalities in Colombia and in five Latin American countries: Honduras, El Salvador, Panama, Peru and Chile.

The Integrated Solid Waste Management (IMSW) has been an important aspect for the government's public policy agenda, taking into account that the annual percentage of the tons that are wasted corresponds to 34% (DNP, 2017), still exists open air dumps, a high percentage of greenhouse gas emissions (GHG) is generated, aspects that have an impact on the sustainability of cities and their inhabitants.

Therefore, this article sets out the guidelines of the IMSW policy of the Colombian government, followed by the actions carried out by the Interaseo Group to be at the forefront in the provision of public services and finally the challenges they face.

1. Policy for the integral management of solid waste 2016-2030 Colombia

The National Planning Department of Colombia through CONPES 3874 of 2016 established the IMSW policy, integrating the direct goals of the Sustainable Development Goals (SDGs) and the commitments of COP21, in the following sense:

- Objective 11.6. Reducing the negative environmental impact on cities trough an emphasis on waste management.
- Objective 12.3. Reducing food waste and production losses on supply chains.
- Objective 12.4. Achieving an environmentally reasonable and balanced waste management.
- Objective 12.5. Decreasing waste generation.
- Commitment to COP21. Reducing greenhouse gas emissions (GHG) by 6% in the waste sector.

In this way, the government proposed a IMSW policy that aims at the circular economy, minimizing the generation of waste and maintaining the value of products and their materials in the economy for as long as possible (DNP, 2017). For this purpose, they propose five instruments:

i) Prevention
ii) Reuse
iii) Recycling
iv) Treatment (biological, power generation, volume or size reduction)
v) Final disposal

2. IMSW of Interaseo Group

Interaseo is a Colombian business group that provides public water, sewage and waste management services with a presence in 57 municipalities in Colombia and in five Latin American countries: Honduras, El Salvador, Panama, Peru and Chile. In all its operations, Interaseo stands out for the following contributions to the fulfillment of the SDGs and the implementation of the IMSW:

- Achieve carbon footprint annual reduction targets, which reached 34,205 tons of CO2 last year for Colombian operations.

IN THE VANGUARD ON SOLID WASTE MANAGEMENT

- Environmental monitoring systems in order to guarantee the quality of service provision and compliance with the obligations related to environmental licenses.
- Implementation of treatment systems such as the generation of electric power 8.1 MW at the Cerro Patacon sanitary landfill in Panama City.
- Comprehensive management for waste from construction, demolition and hazardous waste.
- Final disposal of waste, with high quality standards and complying with the regulations in force for the 16 sanitary landfills operated in Colombia and abroad.
- Transfer of solid waste and micro routing efficiency, which has allowed reducing greenhouse gas emissions (GHG) by having to make fewer trips to landfills.
- Machinery and efficient equipment for the integral management of solid waste.
- Sorting and harvesting stations have been installed with the objective of increasing the materials that can be reincorporated into the production chain in order not to be taken to the landfills.

All these actions have allowed an average performance that in 2018 includes:

- 48,849 m^2 of public areas washing
- 49,008 m^3 of debris technical disposal
- 30,186 tire units properly disposed
- 9,960 tons of hazardous waste
- 65,855,993 m^2 of lawn mowing
- 4,212,157 km of beach and public areas cleaning and sweeping
- 3,736,289 tons of final disposal
- 2,458,680 tons collected
- 870,918 tons transferred
- 620,389 m^3 of treated leachate
- 817 tons effectively recycled

On the other hand, the Interaseo Group has provided improvements in the quality of life in essential aspects such as access to public home services, for which alliances have been established with territorial entities in order to boost, optimize and generate sustainable development in these territories.

3. Challenges of the Interaseo Group

The challenges of the Interaseo Group are mainly focused on remaining a benchmark in the provision of public services, implementing and evaluating alternatives to final disposal that generate greater environmental benefits and being economically sustainable over time.

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www.interaseo.com.co

COMVIVE: THE REAL ESTATE DEVELOPER WITH SUSTAINABLE DNA

Sustainable housing developer with a comprehensive and replicable model.

The UN estimates that 55% of the global population lives in urban areas, a figure that is projected to rise to 68% by 2050. With few exceptions, cities are expected to become bigger and more numerous. It is fundamental that new communities be designed to promote a sustainable quality of life.

México, as most emerging countries, has the challenge in next decade to build sustainable and resilient cities. With over 130 million citizens has housing shortage of 14 million units, representing 34% of total home inventory. During the last 15 years, government and private sectors have joined forces to produce and finance more than 10 million homes, prioritizing lower income populations.

However, the challenge is still large, even more so considering that the UN Sustainable Development Goals (SDG's) have been incorporated into the 2019-2024 National Development Plan, aligning Mexico to the 2030 Agenda for Sustainable Development. For the housing sector, the goal is not only about building houses, but also to create sustainable communities for the Mexican families.

Aligned to this, COMVIVE has defined its strategy to incorporate the SDG's related to the environmental, social and economic challenges of our world.

COMVIVE, a Mexican housing developer, committed to the role housing holds for the development of the country and its people, is creating sustainable communities to radically improve the lifestyle of those who live in them and opening a better development potential for their clients, employees and investors.

COMVIVE is a Mexican company created by professionals with an average of 20 years of experience in the housing sector. Its goal is to improve the lifestyle of Mexican families, creating sustainable communities of value to its residents, their surroundings and the country as a whole. COMVIVE has developed 11 communities, which represent more than 1,500 houses, with the goal of creating 8,500 houses over the next five years.

COMVIVE creates comprehensibly sustainable housing developments, incorporating the SDG's, starting from the planning phase, choice of land, urban and architectural project, selection of construction materials and community building.

COMVIVE's sustainability strategy is executed on three axes:

1. **Environmental innovation applying ecotechnologies to its homes while obtaining environmental benefits on quality of life and economy for its residents**. COMVIVE is implementing the "NAMA Facility" program, designed by Sociedad Hipotecaria Federal (SHF), a financial institution that promotes the development of the housing sector in México. "NAMA Facility" is a financing initiative funded by KFW, a German Development Bank, offering incentives to implement ecotechnologies to cut emissions and tackle climate change. These technologies allow COMVIVE to mitigate CO2 emissions by 32% and reduce the cost of energy for residents.
2. **Social Impact, building Community Development Centers (CDC), offering health services, education, social inclusion and nutrition guidance**. COMVIVE implements an urban architectural design creating sustainable communities with parks, bikeways, densification, urban agriculture, schools and commercial services.
3. **Economic Sustainability, offering communities professional management services, which provide maintenance and security to all its residents**. In addition, in the CDCs, offer job training programs that help people improve their skills to obtain a better job and salary.

COMVIVE is committed to innovate in sustainable solutions, offering better quality of life for Mexican families, as well as believing that aligning its value proposition to SDG's is a fundamental step forward to contribute to the 2030 Agenda for Sustainable Development.

ENVIRONMENTAL EDUCATION WORLDWIDE INITIATIVE: ON A MISSION TO CREATE AGENTS OF CHANGE

We have a single purpose: environmental education worldwide.

Great transformations are achieved by raising awareness, consciousness and collaboration. We are all part of the same planet and only by acting together we can mitigate the effects of the environmental and climate crisis.

In Mexico, we are convinced that the essential tool to combat climate change is education with a particular focus on future generations. We firmly believe that the education of future citizens is the transforming element to guarantee our world's present and future as a sustainable habitat, where we as human beings are able to respect and co-exist with the various ecosystems. We strongly believe in the importance of creating agents of change through environmental education prioritizing the development of competences that students can apply in their daily lives.

The Mexican Context
Mexico is a country of great biodiversity with a large number of initiatives seeking to contribute, through awareness-raising actions, educational programs, advocacy on public policies and campaigns on mass and social media regarding the importance of working together to combat climate change. Standing out among these initiatives is the Telar Social, an NGO, which has been working several years to introduce a Constitutional amendment about environmental education.

In November 2018, within the EarthxMexico 2018 event, a group of civil society organizations, including EarthxMexico, Telar Social, Fundación EDUCA, Fundación Reversible, Reeduca, Cíclica, and important universities and NGOs, launched the Chapultepec Commitments, of which Environmental Education is an essential part. This commitment included presenting a motion to Mexican Congress to incorporate green curricula into the educational system as a Constitutional amendment.

In December 2018, Esteban Moctezuma, Secretary of Public Education, with Andrés Manuel Lopez Obrador, Mexico's President, communicated as one of the basic axes of the educational plan, "the obligation to include the respect for the environment into schools curricula, as part of the bases of an integral formation for the future generations of Mexicans".

> *I used to think the top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that with 30 years of good science we could address those problems. But I was wrong. The top environmental problems are selfishness, greed and apathy and to deal with those we need a spiritual and cultural transformation. And we scientists don't know how to do that.*
> *Gus Speth*

In May 2019, in an unprecedented event, Senator Eduardo Murat announced the achievement: "For the first time, the environment is included in the third article of the Mexican Constitution. This is historical. The guidelines for environmental education are included. Children will receive the knowledge necessary to understand the importance of ecological balance, the need to protect natural resources and raise awareness about issues such as climate change".

Within this context, the Environmental Education Worldwide Initiative invites all countries to include environmental education in all of the planet's classrooms, promoting a sustainable way of life.
Our purpose is to implement environmental education in every country.

Our objective is to drive a global educational agreement, recognized and promoted by all signatories of the "Paris Agreement", incorporating environmental education through school curricula and educational programs in all classrooms at all educational levels, encouraging educational institutions, NGOs, private sector and government organizations to incorporate this objective into the COP25 agreements.

Our Goal by 2025 is to have all "Paris Agreement" signatory countries incorporate environmental education into their Constitution, as state policy, developing green school curricula and educational programs for all levels.

Participation in COP25
Environmental Education Worldwide Initiative will participate in COP25 in the "Environmental Education" panel, at Blue Zone, with the objective of sharing the Mexican experience changing the 3rd article of the Constitution, incorporating environmental education in the school curricula at all educational levels.

Members of the panel will be key leaders who actively participated in incorporating environmental education as a Constitutional amendment, thereby guaranteeing its mandatory nature in school curricula and educational programs from preschool to postgraduate.

It's an honor for The **Environmental Education Worldwide Initiative** to participate in COP25 Chile to share our initiative and promote a global environmental education agreement that leads us to create and educate billions of "Planetary Warriors" worldwide.

THE LAGO SOFÍA CASE

Conecta SpA advises Lago Sofía to revolutionize the salmon industry by putting value on organic waste for the circular production of sustainable food.

Conecta SPA
Competitividad & Entorno

The Case of Lago Sofía Circular Food

Boarding:
To develop a new fishery, from the beginning of the last century until the 1970s, the Chilean government conducted research and trials to introduce salmon into rivers throughout Chile. Although the species was introduced successfully, its commercial capture did not produce good results initially.

A decade later came the great leap: it was possible to develop the complete cycle in cultivation systems commercially. Today, salmon tops the list of foods exported by Chile, is the second largest producer in the world and is a key player in entrepreneurship and employment in the south of the country.

Take-Off:
In 1987, 52% of the population in the Los Lagos region was poor and 23% indigent. In the third poorest region of Chile at the time, public policies aimed at promoting the development of a new economic sector to quickly resolve a primary need of the population. In turn, markets such as Japan and the United States spurred the rapid growth of the Chilean salmon industry, coupled with constant innovation in machines, supplies and processes to increase the efficiency and productivity of the sector.

10,000 feet up:
The obsession of any production employee of a salmon company is to convert a kilogram or less of food into a kilogram of salmon. The conversion factor, as this indicator is called, is the main gear in a highly efficient productive model. In fact, the economic conversion factor in salmon is 1.2 - 1.5kg while in bovine meat the value is four to six times more (*Global Salmon Initiative, 2018*). The edible portion of a salmon is 68%, 22% more than chicken, for example and, since its cultivation is carried out in aquatic systems according to the spatial dimension of depth, salmon farming occupies a portion of territory of 3,7 m^2 for every 100g of salmon, three times less than pork and 27 times less than beef.

The efficiency in the consumption of food, the concentration of space production, the high retention of energy and protein and the low losses of its transformation to final product, help reduce the generation of CO2. Salmon generates 0.60g CO2eq for every 40g of product, while other proteins such as beef produce almost 10 times more for the same portion of meat.

In light of these results, for many, salmon production is an industry that could transform into a sustainable food solution for the world, with significant space for growth, because it makes up only 1% of total protein production.

Turbulence:
After 30 years, poverty in the Los Lagos region is at 11.7% (CASEN, 2017), so the scenario is different. Concerns about employment and economic development have moved to issues related to quality of life and well-being, where the environment plays a leading role.

At the local level, salmon production activity comes into question in light of the loss of biodiversity close to the cages, the use of antibiotics, the escape of fish and liquid waste on the water.

The image of an industry that generates environmental impact in the locality has been installed in the community. As a consequence, regulations that once promoted salmon production have been replaced with regulations that restrict growth through the blockage of new cultivation licenses and establishment of maximum production limits according to sanitary and environmental standards.

As a result of this new situation, the Chilean salmon industry is in a stage of technological and conceptual transition, as it was in the mid-1980s. Today its production systems are moving in the direction of operational sustainability through innovation, to reduce impact by improving efficiency levels.

Landing on Lago Sofia Circular Food:
An example of the new revolution that the salmon industry is carrying out is the Lago Sofía Circular Food company's project, in the city of Puerto Montt, Los Lagos region, Chile. It is a fish farm that uses fresh water sources to produce the initial stages (fry and smolts). With specialised technology, 97% of the water recirculates, for greater water use efficiency and minimisation of the use of a very important resource for the population.

With this in hand and a project idea, the CEO of Lago Sofía Circular Food, Mr Miguel Portus, invited our consulting firm, Conecta SpA, to take up the challenge of finding alternatives so that their operations "add environmental value". That is,

A SUSTAINABLE FLIGHT TO SALMON FARMING IN CHILE

they not only compensate for the carbon footprint of their activities, but can also provide benefits for people and the environment through the use of waste, input optimisation and production of circular food at the local level.

Beginning in 2020, Lago Sofía Circular Food will implement a unique circular economy model in Latin America on a commercial scale. The production of hydroponic vegetables will be integrated into fattening operations using nutrients such as phosphorus and nitrogen present at the residual level in the effluent. It is an installation of more than 2,000m^2 to produce vegetables that will be marketed within a radius of no more than 80km, so they are consumed by the local population, promoting the local consumption of healthy food (currently vegetables are moved from the central area from Chile, more than 1,000km away).

Responding with innovation to generate efficiency and maximise the social and environmental benefit of salmon production in Chile is a game that is in force, and with initiatives such as those of Lago Sofía Circular Food it is possible to envision an industry flying between global and local benefits.

www.lagosofiacircularfood.com

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