INDORAMA VENTURES

Climate-Related Risk Management

SUMMARY REPORT 2019

Contents

Introduction

Climate Change

The chemical sector supplies a broad range of products that serve a range of markets and industries. The chemical sector is a large energy user and greenhouse gas (GHG) emitter, and faces risks associated with climate change and other sustainability issues. It is linked across entire value chains across almost all other industries, and is a key enabler of the low-carbon economy.

We are fully committed to finding sustainability pathways and have proactively established our targets as indicated in our Climate Strategy 2025 focusing on four key areas alleviate the activities that cause climate change. We see the circular economy as an important instrument in combating climate change and an opportunity to strengthen our recycling business globally. Through innovation, we aim to create products that can be used at their maximum value for as long as possible. In working towards the Science Based Targets initiative (SBTi), we expect to sharpen our focus and better shape the direction of our sustainability efforts by linking our targets directly to climate science. We, therefore, plan to initiate SBTi in 2021-2022 as part of our Sustainability and Climate Strategy.

TCFD Background

The Task Force on Climate-Related Financial Disclosures (TCFD) was created in 2015 by the Financial Stability Board (FSB) to develop consistent climate-related financial risk disclosures for use by companies, banks, and investors in providing information to stakeholders. TCFD recommendations are globally recognized for climate-related risk management from the perspective of financial institutions.

TCFD recommendations serve as a global foundation for effective climate-related disclosures. IVL's disclosures are in line with the TCFD recommendations which enhance its consistency, robustness, and comparability. Our activities and contributions are detailed demonstrating how they support each of the four frameworks. IVL is a supporter of the TCFD recommendations and has implemented the following core elements of recommended climate related financial disclosures:

The TCFD recommendations consists of four parts (Governance, Strategy, Risk Management, Metrics and Targets) which will be explored in this report.

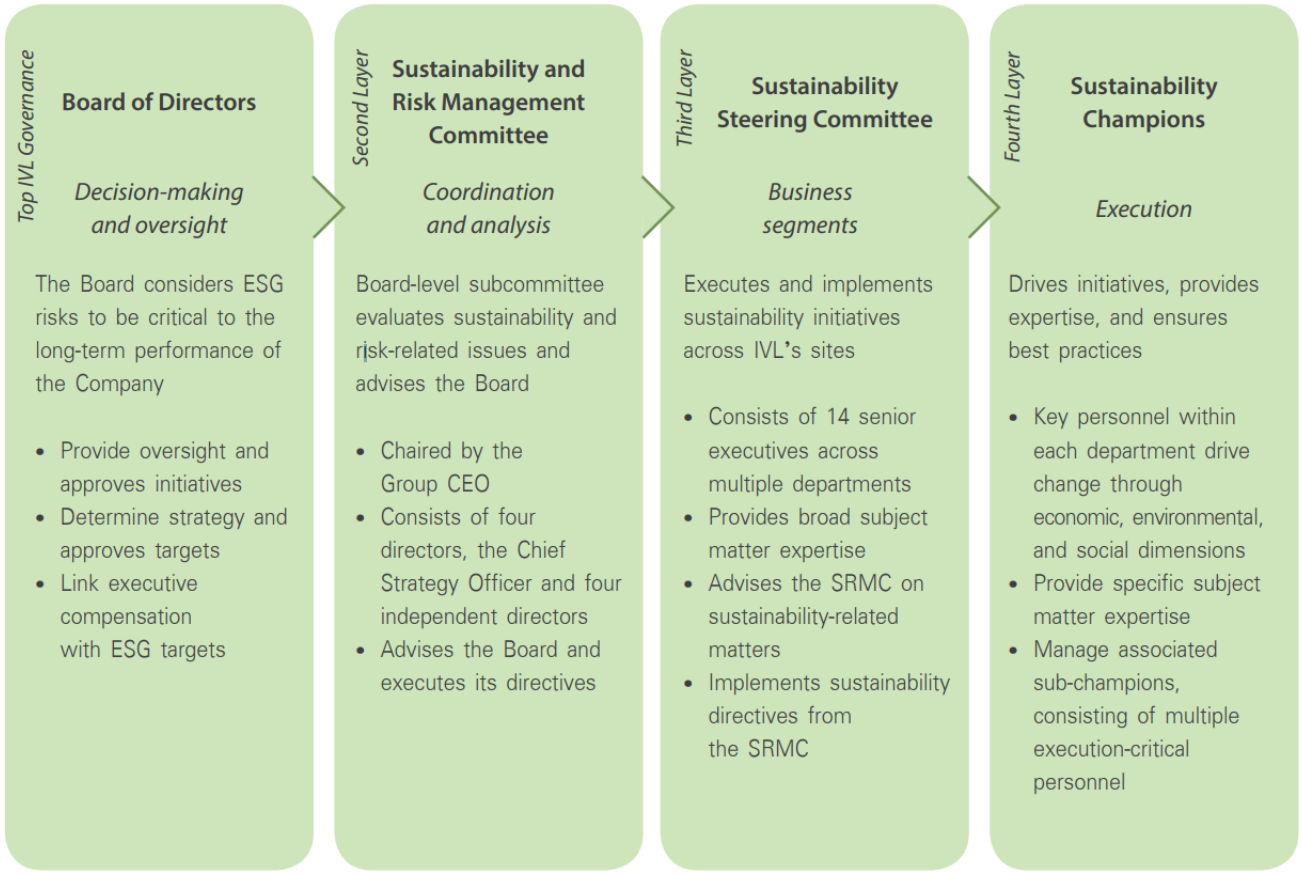
Implementation of TCFD Recommendations

1. Governance

The board of directors provides oversight of and reviews climate-related risks and opportunities directly and additionally through the Sustainability Risk Management Committee (SRMC). The SRMC is one of three board sub-committees. The other two sub-committees are the Nomination, Compensation, and Corporate Governance Committee (NCCG) and the Audit Committee. The Audit Committee takes an active role in assessing the quality and reliability of sustainability performance reporting.

The SRMC, which meets quarterly, is chaired by the Group CEO and includes the CEO - Feedstock and PET, CEO - Fibers, Chief Recycling Officer, Chief Strategy Officer, and four independent directors. The nine members of the SRMC work with a variety of departments including finance, risk, strategy, and sustainability in view of the broad and multidisciplinary nature of sustainability matters.

The SRMC approves and reviews the implementation of sustainability strategies including climate strategies, the implementation of sustainability initiatives including TCFD recommendations, scenario analyses, current and future physical and transitional risks including financial and non-financial implications, and plan the necessary measures to mitigate or eliminate these impacts.



IVL's risk management process is based on the Committee of Sponsoring Organizations of the Treadway Commission (COSO) framework and integrates climate risk into the risk management structure. An effective risk management structure provides strong support for risk management processes and their implementation. The Sustainability & Risk Management Committee (SRMC), a subcommittee of the Board, business risk committees and risk champions play an important role in endorsing risk management throughout the organization which encourages the establishment of lines of authority, and the distinct roles and responsibilities of management and employees. Embedding risk champions as coordinators in enterprise risk management is designed to support our business in applying risk management processes and techniques with increasing awareness, ownership and management of risks leading to improved business performance.

We conduct a company risk assessment that allows any entity to obtain a holistic view of the risks it faces and allows management to identify these risks and capitalize on opportunities. We assess the potential impact and likelihood of risks. This covers the assessment and review of internal and external risks, including global risks and other factors that may affect our operations due to increased business and international operations.

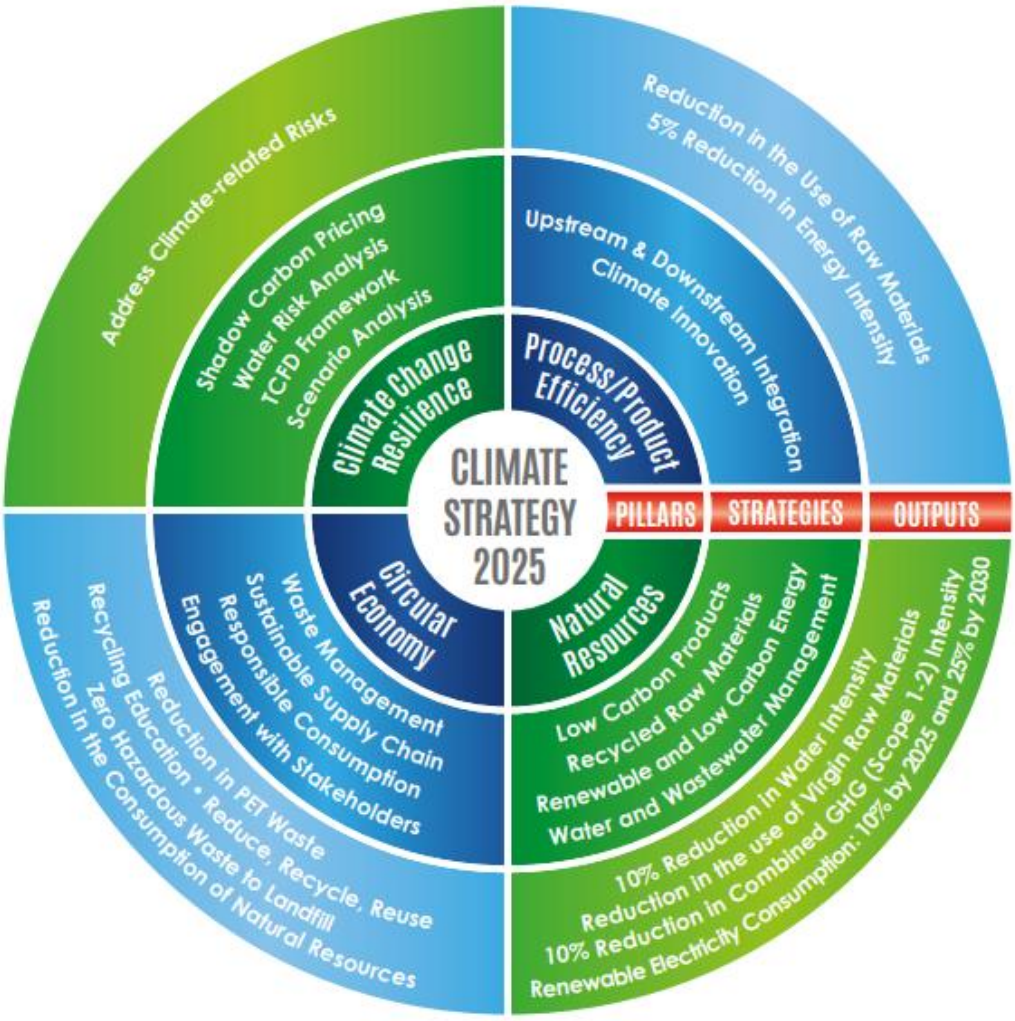
This also helps us to gain an understanding of the risks that can pose potential difficulties to our operations. We categorize business risks, operational risks, management risks, financial risks, and compliance and legal risks that cover our enterprise risk management as a whole. In addition, emerging risks are analyzed as they may develop or already exist but remain difficult to quantify and may have a

high loss potential or a high degree of uncertainty. Additional information on “Risk Factors” and “Emerging Risks” are provided in our Annual Report 2019.

While the tone of the organization at all levels is geared to risk management, other significant elements include our risk governance structure, corporate values, codes of conduct and ethics programs, policies and procedures, risk committee oversight activities and risk assessment processes

2. Strategy

As part of our global corporate citizenship, we analyze and find opportunities to ensure that our sustainability efforts and measurable contributions are in line with climate science, and keeping a rise in global temperatures to well below 2°o C, as per the Paris Agreement. We apply Climate Governance guidance from the World Economic Forum as a tool to help elevate the strategic climate debate and drive holistic decision-making that includes careful consideration of the links between climate change and business. Climate governance is the structure of rules and processes that IVL puts in place to ensure that we properly assess climate-related risks and opportunities, take appropriate strategic decisions on how to manage those risks and opportunities, and report on relevant goals and targets, along with roles and responsibilities.



IVL identifies risks at the corporate and subsidiary levels around the world through integrated work processes and group-wide risk management, applying the enterprise risk management (ERM) framework using top-down and bottom-up approaches to anticipate any issues to mitigate their impacts in advance. They are identified through short-, medium-, and long-term timeframes. The climate-related risk management are analyzed through the perspective of (1) physical risk and (2) transition risk and their respective subcategories:

Climate Related Risks

Transition Risk

Technology

Medium-term (3-10 years)

Higher costs from increased energy consumption
Unsuccessful investments in new technologies
Upfront costs to transition to lower emissions technologies
Substitution of existing products with low emissions options

Market

Medium-term (3-10 years)

Changes in customer preferences from high carbon intensive to low carbon products
Increased cost of raw materials

Policy and legal

Medium-term (3-10 years)

Increased operational costs due to changes in environmental legislation
Implementation of cap-and-trade or a carbon tax in some countries
Exposure to litigation
Enhanced emissions reporting obligations

Reputation

All time frames

Global focus on plastic pollution
Movements on fossil fuel avoidance
Change in consumer preferences
Increased stakeholder concern

Physical Risk

Acute

Medium- and long-term (3+ years)

Increased severity of extreme weather events such as cyclones, droughts, and floods.

Chronic

Medium- and long-term (3+ years)

Risk of sea level rise and riverine flooding for sites located in high risk areas
Rising mean temperatures
Changes in precipitation patterns and extreme weather variability
Impact of water stress on production

Climate Related Opportunities

Resource efficiency

Use of more efficient modes of transport
Use of more efficient production and distribution processes
Use of recycling
Building efficiency improvements
Reduced water usage and consumption

Energy source

Use of lower emission sources of energy
Use of supportive policy incentives
Use of new technologies
Participation in carbon markets
Purchase of energy attribute certificates
Innovative power purchase contract structures

Products and services

Development and expansion of low emission goods and services
Development of climate adaptation and insurance risk solutions
Development of products or services through R&D and innovation
Diversification of business activities
Shift in consumer and customer preferences

Markets

Access to new markets
Use of public-sector incentives
Access to new assets and locations needing insurance coverage

Resilience

Participation in renewable energy programs and adoption of energy efficiency measures
Resource substitution, innovation, and diversification
Development and deployment of recycling technologies
Meeting and getting ahead of emissions and single-use plastics regulation

3. Risk Management

IVL manages risks at the corporate and subsidiary levels around the world through integrated work processes and group-wide risk management, applying the Enterprise Risk Management (ERM) framework using top-down and bottom-up approaches. On an initial assessment, we identify risks and opportunities associated with climate change through the use of an ERM framework to anticipate any issues to mitigate their impacts in advance. Mapping is performed across the IVL asset portfolio to identify sites with high ESG risk. We then perform a targeted intervention to mitigate the identified risk. Examples of these strategic initiatives are listed below:

Shadow Carbon Pricing

We considered the IEA 450 scenario for financial analysis by using internal shadow carbon prices and the carbon taxes for countries where we operate. We conducted stress-testing analysis assuming carbon prices of USD 100 and 75 per ton for OECD and non-OECD countries respectively for 2030 to anticipate the impacts on production, EBITDA, and revenue as part of our risk management process.

Water Stress Analysis

IVL uses the WRI's AQUEDUCT Water Risk Atlas, Climate Resilience Evaluation & Awareness Tool (CREAT), and Climate Information Portal (CLIPC) to examine current and projected climate related issues. We also conducted a high-level study based on the Intergovernmental Panel on Climate Change (IPCC)'s 5th Assessment Report (AR5) on changes in regional weather phenomenon and changes in annual mean temperatures up to 2040.

Sustainability-Driven Investments

IVL is investing in numerous initiatives to achieve a more sustainable product portfolio. We are in the process of transitioning towards low carbon-intensive fuels, and aim to invest USD 1.5 billion in recycling systems by 2025. Furthermore, we aim to improve our ESG performance in order to attract additional investments from the rapidly growing sustainable finance sector.

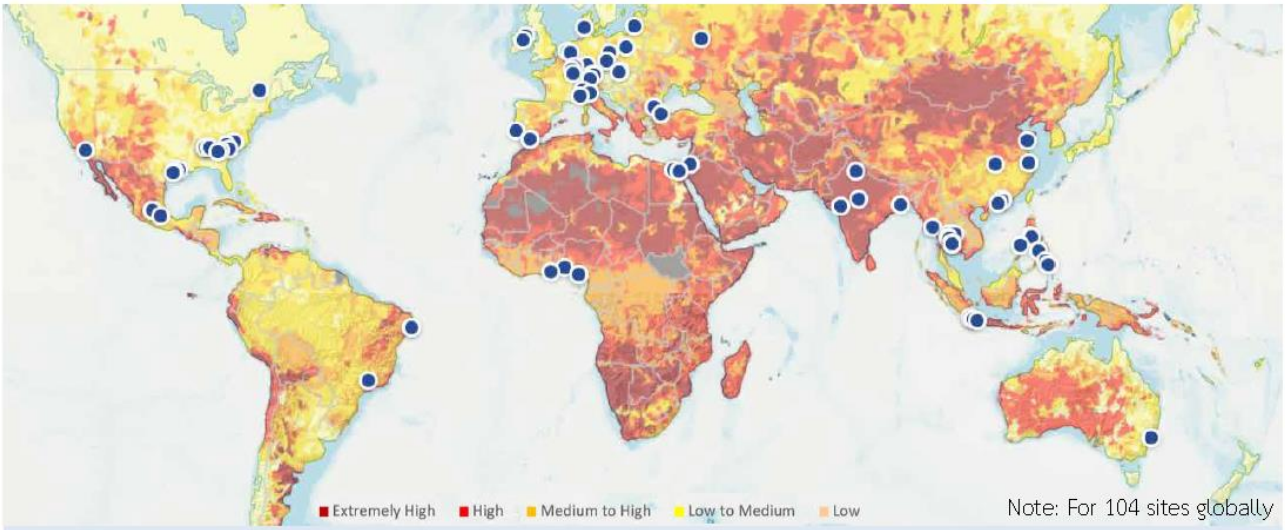
Strategic Analyses Driving Decisions

Financial analyses are performed according to the scenarios underlying the above themes in order to see how they affect Revenue, Cost of Goods Sold, EBITDA. From the results and cost estimations, we communicate directly with plants to develop clear action plans and assign champions to coordinate with all plants and regularly report to management. Further details are available in the "Risk Factors" section of our Annual Report 2019. Results of the water stress analysis and details on sustainability-driven investments are available below:

Water Stress Analysis

IVL is conscious of water risk and is demonstrating responsibility through our efficient water management stewardship. We focus on local water risk assessments and through follow-up, have an effective risk management system in place, and regularly assess our exposure to water related risks. We conducted a water sensitivity analysis using the AQUEDUCT Water Risk tool developed by WRI to identify water stress locations in 2019. This tool helped us to evaluate changes in water demand, water supply, stakeholder risk, and regulations based on current and future conditions. It also enabled us to foresee changes to water risk forecasting in 2020, 2030 and 2040. These results have been analyzed and discussed during risk assessment committee meetings on a yearly basis to identify the necessary mitigation measures and any meaningful initiatives for plants located in areas facing extreme water stress or significant risks to water usage.

2019 water sensitivity analysis using the WRI AQUEDUCT Water Risk tool



Summary:

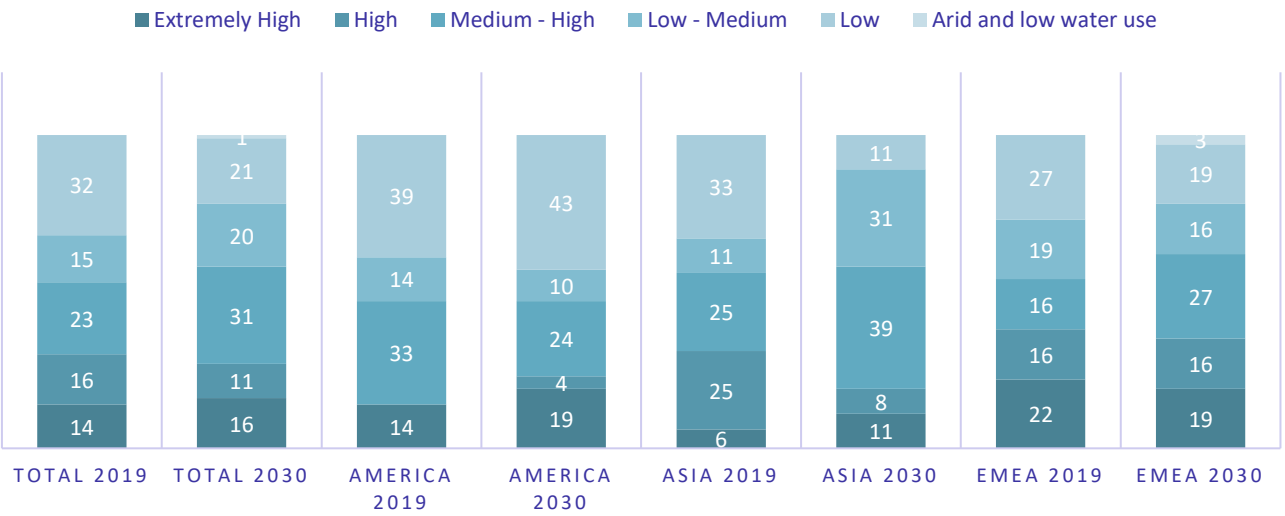
13% of operations in **Extremely High** Water Stress Areas

15% of operations in **High** Water Stress Areas

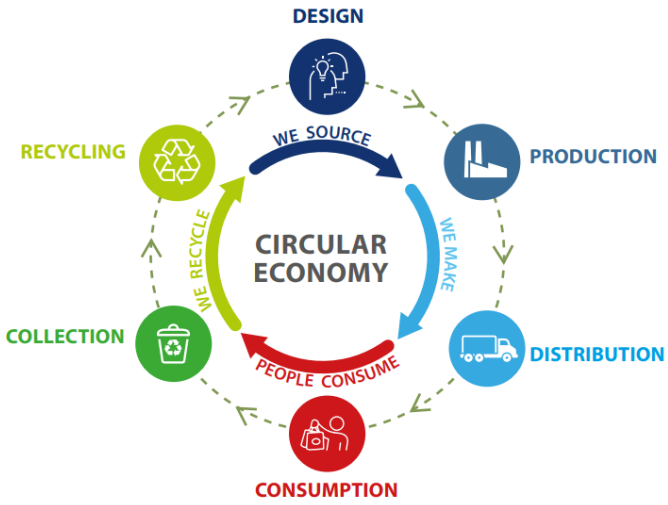
26% of operations in **Medium to High** Water Stress Areas

14% of operations in **Low to Medium** Water Stress Areas

32% of operations in **Low** Water Stress Areas



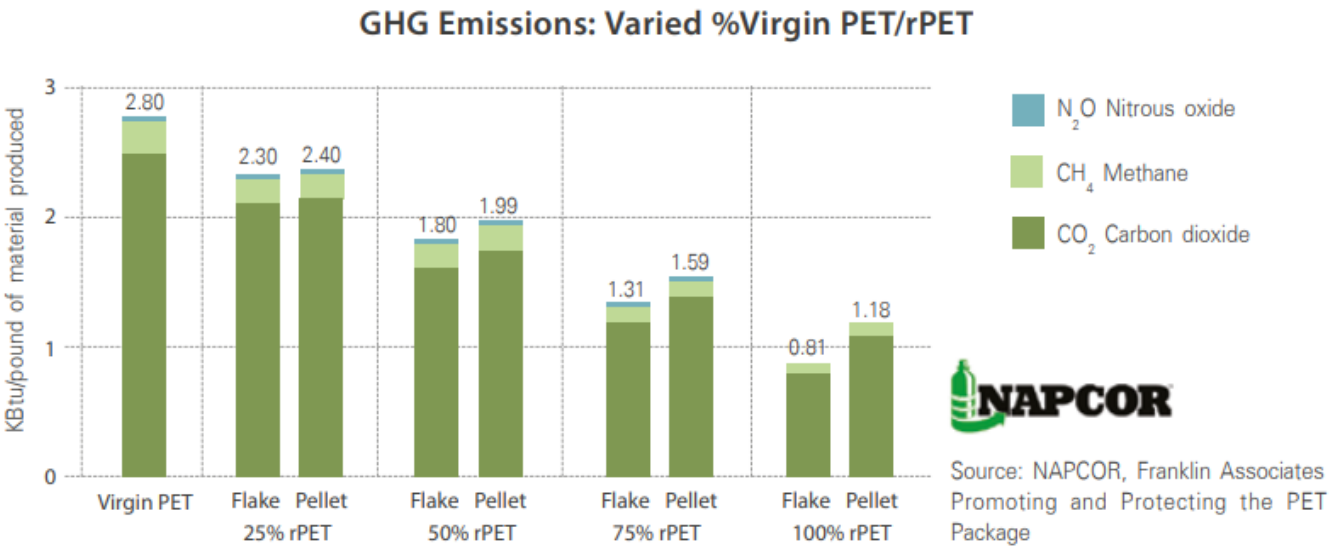
Sustainability-Driven Investments



Our recycling strategy is focused on strengthening our capability to increase recycling rates globally, contributing to a Circular Economy, and ensuring a fully closed loop. We will build on our leadership position as the largest virgin PET producer and remain a leader in rPET. As a leading recycler in Europe, North America and Asia, we have a competitive advantage in rPET, by our global footprint, 30 years of recycling expertise, and strong partnerships across the circular value chain.

We are actively working with the European Union to reduce plastic waste as part of their Single Use Plastic Directive and intend on remaining at the forefront of recycling plastic waste and adopting business models that reinforce circular processing.

- We are increasing our investments in recycling plants and **committed USD 1.5 billion** to build the recycling infrastructure needed globally to close the loop, encouraging the end-use of recycled PET and delivering a circular economy for beverage packaging.
- We have committed to increasing rPET capacity to 750,000 tons per annum by 2025
- We are working with several industry partners to achieve a circular economy for sustainable plastics.
- We have acquired proprietary knowledge of mechanical recycling, which we are scaling up and developed partnerships with innovative players to develop and test next-generation chemical recycling technologies.



ESG Finance Gap Analysis

IVL regularly performs gap analyses on identified ESG risks based on data provider metrics and industry experts in order to drive improvements in the risk profile of the company and secure more favorable credit terms. Many multinational lenders and asset managers are signatories or are becoming signatories to the UNPRI (United Nations Principles for Responsible Investment) and UNPRB (United Nations Principles for Responsible Banking) and are integrating ESG into the investment process. ESG data used in the gap analysis was sourced from the largest ESG data providers with active relationships with financial institutions including MSCI, Sustainalytics, ISS, and RobecoSAM.

A company that is lagging in this area could face the risk of being outmaneuvered by companies that have positioned themselves more favorably with eco-friendly or green products/services, may not be in a position to attract green loans, low cost funds, ESG investors.

IVL's ESG Leadership:

IVL is a global leader on ESG integration and was able to secure Thailand's first green loan from Japan's Mizuho Bank for both USD 200m and EUR 200m, and a subsequent syndicated ESG loan for USD 255m.

Plant-Level Changes Resulting from Strategic Analyses

These initiatives drove decisions that resulted in plant-level changes. Examples of these plant level changes are shown below:

Shifting to Inert Gas in place of Greenhouse Gas

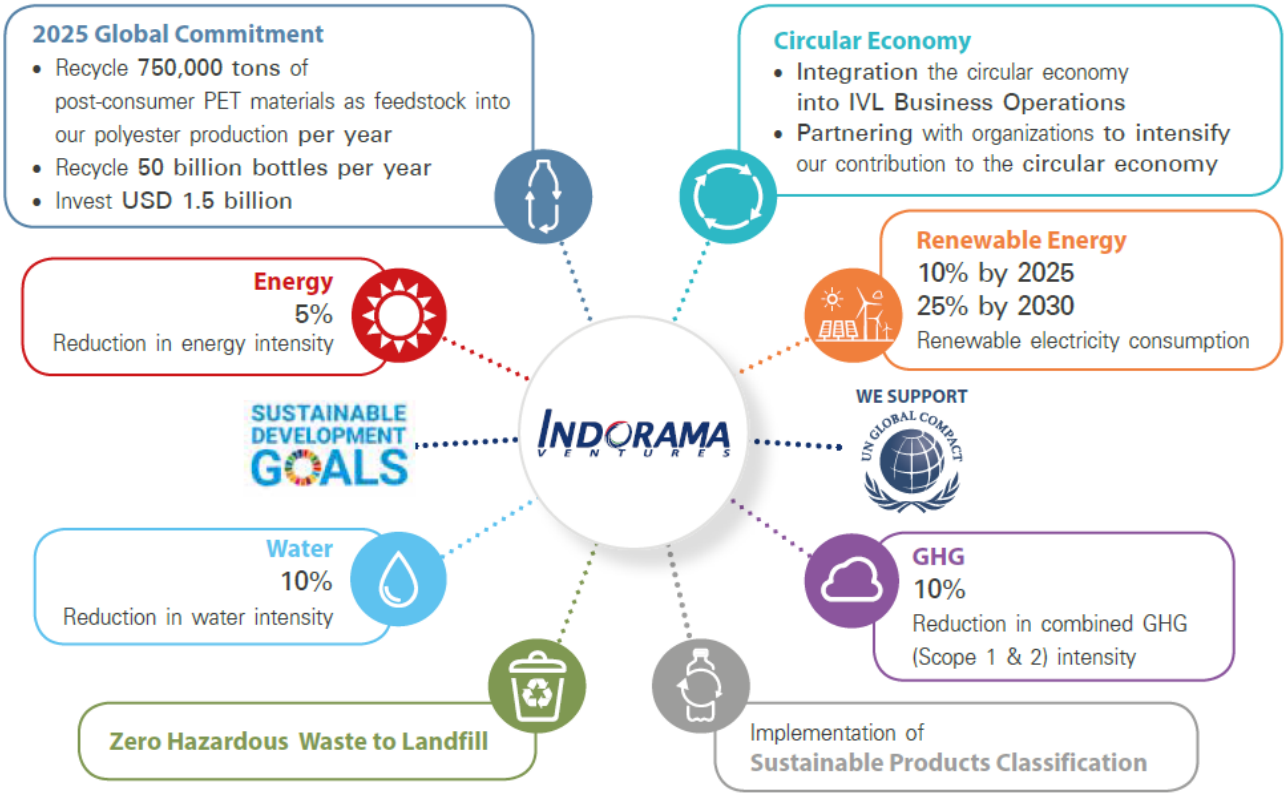
Indorama Ventures Polimeros S.A. (IVPSA) in Brazil, a wholly-owned subsidiary of the Company which operates the largest single line site with a PET production capacity of 550,000 MT/year, was using carbon dioxide (CO_2) in their solid state polycondensation process due to its higher density, avoiding large dimensions of equipment (mainly blowers and crystallizers). However, in 2018, IVL made the decision to invest USD 1.1 million to change the process gas in the plant to nitrogen (N_2), after completing technical studies on the viability of shifting from CO_2 to N_2 with some modifications. This change provided major environmental benefits by eliminating the use of CO_2 gas from process consumption, resulting in a CO_2 reduction of 6,132 tons/year with a corresponding 10% reduction in greenhouse gases with reduced energy consumption. With the installation of the inverter driven equipment, overall energy consumption was reduced by 30%, resulting in an additional reduction of 81.1 tCO_2 e/year. This also indirectly helped by reducing the CO_2 transported by trucks. In addition to the energy and CO_2 reductions, this project provided a huge cost-savings as production costs were reduced by almost USD 1.5 million per year.

Solution for Large Volume of Wastewater and Excessive Disposal

For efficient and effective management of wastewater, Avgol, Russia, a subsidiary of the company, has installed a wastewater evaporator in order to reduce the volume of wastewater discharge thus lowering the load of wastewater treatment after discharge. , and reducing the treatment cost in return. The evaporator handles silastol – which makes up just over 5% of Avgol's waste, almost all of which is uncontaminated or unpolluted. The estimated annual cost-savings amounts to USD 13,000. The wastewater evaporator began operations last year saving 480 l/day, and was designed to process liquids originating from various industrial processes. The use of a vacuum system in the installation allows the boiling process to be achieved for liquids at a temperature significantly lower than in normal atmospheric pressure conditions (boiling begins when the liquid reaches 30˚C. This can reduce the energy need for high boiling point condition and decrease amount of water consumption as evaporated water can return to process.

4. Metrics and Targets

We support all plants in reducing GHG emissions by utilizing renewable energy, conducting energy efficiency projects and monitoring energy consumption in every country where IVL sites are located. We also support the Paris Agreement for which many countries have pledged to reduce their GHG emissions through Nationally Determined Contributions (NDCs). We set the following key sustainability ambitions for 2025:



- Energy
  - Transition from high-carbon energy sources to low-carbon energy sources
  - Increase **renewable electricity** consumption from 6.86% to 25% by 2030
  - Reduce **energy intensity** by 5% by 2025 from 2019 levels
  - Undertaken several energy efficiency projects, increased our renewable energy consumption, and explored new technologies.
  - Joined the Renewable Electricity Buyers Alliance (REBA) to better understand the renewable electricity market and exploring renewable electricity procurement through a global virtual power purchase agreement (VPPA).

- Product Stewardship
  - Working in partnership to accelerate the development of low carbon or environmental friendly products and deployment of new technologies.

- GHG Emissions
    - Reduced 6% **GHG (scope 1&2) intensities** in 2019 against 2020 target from 2013 levels.
    - Set a target to further reduce 10% by 2025 from 2019 levels

- Water
    - Reduce Water Intensity by 10% by 2025 from 2019 levels
    - Increase **water recycling and reusing** through Water Treatment Plants (WTPs)

More information on the integration of TCFD recommendations by IVL is available on our website

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