



DRIVING TOWARDS A CIRCULAR ECONOMY



SUSTAINABILITY REPORT 2019



THAILAND, BE PROUD

Thai-based global company recycles

50 BILLION
BOTTLES
SINCE 2011
ON 23 MAR 2020
AND COUNTING



We are accelerating our efforts, pledging to #recycle at least 50 billion bottles per year. Investing USD 1.5 billion to achieve this by 2025.



Let's #recycle together

IndoramaVentures IndoramaVentures_official @IVLteam Indorama Ventures PCL

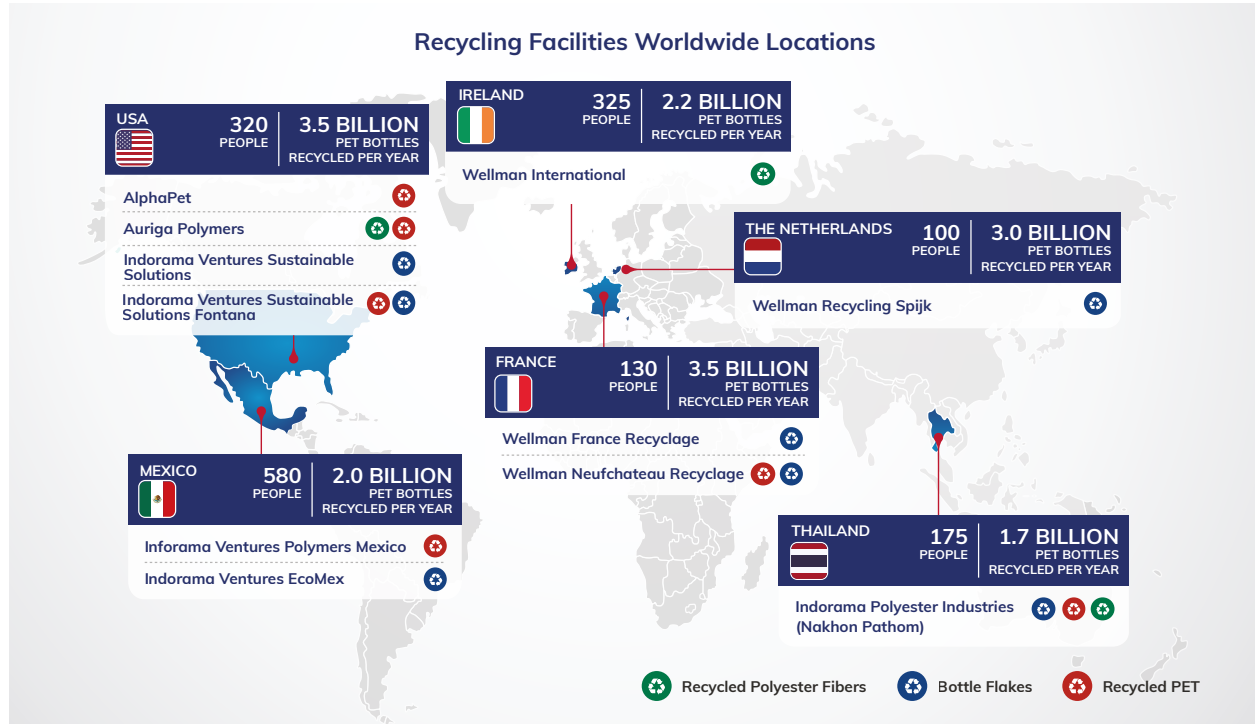


www.indoramaventures.com

CHEMICALS | POLYMERS | FIBERS

Recycled PET (rPET) is a new engine for growth

Indorama Ventures operates 11 recycling facilities worldwide, including Europe's largest PET recycler. As a 100% recyclable material, PET is able to exist in a circular economy where post-consumer items are repeatedly recycled into high quality products such as fiber and bottle applications. Since starting the business in 2011, we have recycled over 50 billion PET bottles and aim to continuously increase our capacity.



FROM POST-CONSUMER PET BOTTLES TO

COVERALL PPE SUITS

Waste separation for the benefit of society


Bringing post-consumer PET bottles through a circular economy, back as PPE protective suits

COVID-19

Key Achievements 2019

MEMBER OF

**Dow Jones
Sustainability Indices**

In collaboration with  **SAM**
a RobecoSAM brand

- Member of the **DJSI World and Emerging Markets** Chemicals Industry
- **Ranked 2nd** among global chemical companies
- Received the **"Silver Class"** distinction



- 2019 Climate Change Rating: **B**



FTSE4Good

- A constituent of the **FTSE4Good Index Series**
- **Best ESG Score** in the 100% percentile of the group in 2019



- Gold Recognition **Top 3%** of suppliers in all categories



SUSTAINALYTICS

- 2019 ESG Disclosure **#3** percentile rank of Commodity Chemicals



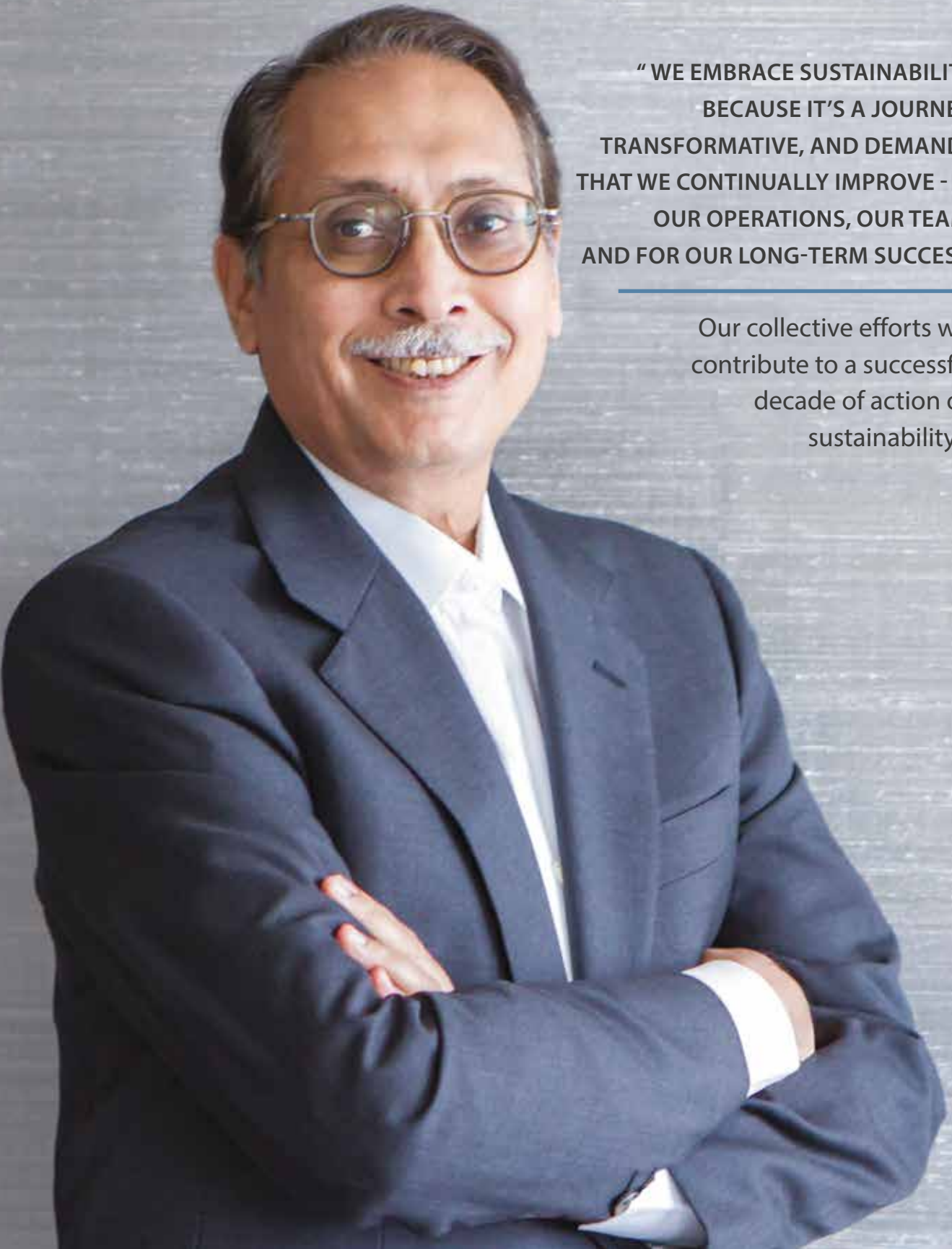
- 2019 ESG Disclosure Score: **BB**



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Group CEO Message



**" WE EMBRACE SUSTAINABILITY
BECAUSE IT'S A JOURNEY,
TRANSFORMATIVE, AND DEMANDS
THAT WE CONTINUALLY IMPROVE - IN
OUR OPERATIONS, OUR TEAM,
AND FOR OUR LONG-TERM SUCCESS.**

Our collective efforts will
contribute to a successful
decade of action on
sustainability."

A leader in recycling

We announced last year at the United Nations “SEA Solutions 2019” partnership week that we are accelerating our efforts to increase our recycled PET volumes to 750,000 tons while also pledging USD 1.5 billion towards achieving this target by 2025 as part of the Ellen MacArthur Foundation and UN Environment Programme’s New Plastics Economy Global Commitment which aims to reduce levels of marine plastic waste in Southeast Asia.

Focused on innovation

Two key acquisitions were made which reinforce our priorities towards innovation. The first, acquiring Huntsman’s world-class integrated oxides and derivatives business is a transformational opportunity that reinforces IVL’s integrated oxides and derivatives business while broadening our expertise through operational excellence, global scale, product portfolio, customer and supplier base, innovative formulations and technologies. This is IVL’s largest acquisition and one of the biggest by a Thai company in the last decade. The second was our acquisition of California-based Green Fiber International, which produces rPET flakes. This extends IVL’s recycled flake supply chain to the US west coast, ensuring that PET bottles are recycled and put to additional use, further supporting the circular economy. It also contributes to our long-term sustainability objectives and our corporate plan to invest significantly in recycling over the next five years.

Communicating our message

As we continue to grow, we are also improving our presence on the global stage participating in numerous events and conferences, demonstrating how we are contributing to climate resilience. I had the pleasure last year to join a high-level climate change panel

This past year was important for IVL on many fronts, and I am pleased to report that we took a number of decisive steps to further strengthen our position in the market while continuing to demonstrate how we are putting our sustainability strategy into practice.

hosted by Saint-Gobain at the FORTUNE Global Forum in Paris. It was an important opportunity to discuss the important steps IVL is taking, and how we can all do more to reduce our carbon footprint helping meet national climate change commitments. IVL also participated in the World Economic Forum, the Goldman Sachs Conference in Paris, the AEC Business Forum 2020, and the CEO Forum held by Thailand’s Ministry of Foreign Affairs.

Investing in a better future

As part of our effort to streamline our operations and ensure that we maintain a sharp focus on our priorities company-wide, we set out five major strategic priorities to better steer our business through the current cycle and beyond. The five priorities, developed within the framework of our vision, values, sustainability, financial aspirations, differentiators and metrics, are the following:

1. The launch of Olympus, our company-wide cost and cash transformation program to support our performance in this low-spread environment and which will position us for the next wave of growth.
2. Driving the full commercial potential in each of our assets to growth both our volumes and our margins.
3. Exploring selective adjacency opportunities to our existing businesses, to incubate our future engines of growth.
4. Doubling down on recycling, to be a leader in PET recycling and setting a new bar for sustainability in the industry.
5. Acknowledging that all of this will only be possible if we are able to invest in and develop the best leadership team in the industry.

[illegible]

Our Sustainability and Risk Management Committee was strengthened with the addition of three new members, one of whom is an independent director, ensuring we maintain a continued in-depth, diverse and focused approach to accomplishing our sustainability mission. More broadly, also in the last year, we announced the appointment of two new members to our senior leadership team, our Chief Strategy Officer and Chief Human Resources Officer, to provide an improved focus in our operational approach and ensuring we have the best personnel going forward.

In our efforts to reduce our greenhouse gas (GHG) emissions, we are continuing to broadly achieve intensity reductions at 6% from 2013 levels for 2020 while further tracking emissions globally for selected criteria, and will align our operations and establish further targets going forward during the year.

It is with extreme regret I must inform you that one of IVL's contractors passed away after being electrocuted at one of our plants in Thailand. We responded by implementing a more detailed corrective and improved action plan to ensure that such a tragedy does not reoccur. Moreover, our facility in Spain, Indorama Ventures Quimica S.L.U. experienced a fire in its PTA/IPA finished product warehouse which was quickly

brought under control. All employees were safe, and the production lines were operating normally. I cannot underscore enough that the health, safety and well-being of our employees is paramount – and our core value as a company. We carried out a detailed investigation at both locations with the necessary remedial actions, and will continue to ensure that all of our employees are working in safe conditions while continuing to invest in occupational health and safety training.

A valuable benchmark for our sustainability performance comes from our external recognitions, and 2019 was an outstanding year reflecting the continued hard work and dedication of our employees worldwide. IVL was included in the DJSI Sustainability World Index for the first time (ranked second among the top global chemical companies), as well as the DJSI Emerging Markets Index for the third consecutive year. We were recognized as one of the Sustainability Leaders 2020, receiving the “Silver Class” distinction in the SAM Sustainability Yearbook, ranking among the top 10% of 108 global chemical companies assessed in 2019. We remain a constituent in the FTSE4Good Series with a higher score and remain at the top of the group with a 100% percentile rank. We achieved the leading score among companies in the Stock Exchange of Thailand and the Global Industry Classification Standard in Bloomberg’s ESG Disclosure Scores, attained the highest score for corporate transparency by

a company in Thailand by Transparency International, with additional recognitions from Sustainalytics, EcoVadis, CDP and MSCI. In the US, we were awarded with the “Sustainability Award” by Coca-Cola at their annual Supplier Summit in Atlanta for our FuTuRePET® Single Pellet Sustainability Solution, which was developed and commercialized to increase recycled content in accordance with sustainability goals while maintaining high package performance standards.

Pioneering green financing

We are also proud to have secured Thailand’s first-ever green loan, for USD 100 million and EUR 100 million, from Japan’s Mizuho Bank. The same has further been increased to USD 200 million and EUR 200 million, with reduction in cost of financing, based on our further enhancement of environment, social and governance (ESG) rating, and is a recognition of our leadership in sustainability.

Turning challenges into opportunities

While we develop our existing markets and enter new segments, we continue to look ahead with an eye to how we can further advance environmental, social and economic benefits for our stakeholders, and achieve our sustainability strategy. Our initiatives going forward will address the important megatrends underway as they have potentially outsized implications on our business operations. These include the climate crisis, security threats, the need to save ecosystems, product specific GHG emissions, and increasing demands from stakeholders. We aim to address each of these trends to our advantage through our blueprint that focuses on the respective opportunities which can contribute to and improve our business over the long-term.

We are in the preparatory stages to become a signatory to the UN Global Compact, the world’s largest corporate sustainability initiative based on CEO commitments covering ten principles that can be incorporated as part of a company’s strategy, culture and day-to-day operations.

Finally, we are all paying close attention to the coronavirus, or COVID-19, which is having major health and economic impacts. IVL is no exception, given our global operations including in mainland China. The Indorama Management Council (IMC) has been closely monitoring the outbreak. The IMC hereby announces a formation of the Global Emergency Management (GEM) Team consisting of representatives from IMC, Businesses, and Regions. The purpose of the GEM team is to have an assigned group of IVL experts/leaders in place and capable of taking any decisions necessary to ensure the safety of our employees and limit any impact for our business. We have taken measures to ensure the safety of our workforce around the world and have increased safety protocols and standards. It goes without saying that we are particularly concerned about the health and well-being of all of our employees and their families, and the continuing impact that COVID-19 is having on the world.

Performance with a purpose


I am proud that we are achieving our sustainability goals through our transformative growth strategy. This is due to the hard work and dedication of our workforce around the world as we go from success to success despite ongoing trade tensions and other uncertainties. We are rapidly becoming a leader in recycling and bringing continued innovations to PET materials and rPET. I remain confident that together, we will succeed in achieving our sustainability objectives in the decade ahead, and would like to thank our employees, shareholders, business partners, and associates for making 2019 a truly successful year.

Together for a Better Tomorrow and Sustainable Future.



Aloke Lohia
Group Chief Executive Officer

Chief Recycling Officer Message



**" RECYCLING IS AT THE HEART OF
A SUSTAINABLE AND FUTURE
GLOBAL ECONOMY, AND WE AT
IVL BELIEVE THAT IT IS A CRITICAL
INNOVATION FOR ECONOMIC GROWTH.**

IVL is rapidly becoming a global leader in Recycling by building the infrastructure the world needs to close the loop and deliver a circular economy for PET packaging. "

I am pleased to lead a passionate and experienced team across the globe. Our goal is to build the recycling infrastructure the world needs. Closing the loop and delivering a circular economy for PET bottles. No recyclable PET bottle should ever leak into our oceans or environment.

In 2019 we stepped up our focus on recycling, creating a separate task force to focus on recycling PET bottles. Our recycling efforts have prevented over 1 million tons of waste going to the landfill, or being incinerated, and displaced in the process, approximately USD 600 million of virgin PET. This recycled PET prevented a further 1.65 million tons of carbon dioxide going into the atmosphere.

We made a global commitment to recycle 750,000 tons of post-consumer PET materials as feedstock into our polyester production per year and to invest USD 1.5 billion by 2025. To achieve this, we are adopting multiple growth strategies and have already identified several projects in the pipeline. In late 2019, we completed the acquisition of California-based Green Fiber's 40 KT PET bottle recycling plant to further increase our recycling presence in the United States. More recently on March 9th 2020 we signed a joint venture agreement with Coca-Cola to build a state-of-the-art recycling plant in the Philippines, taking in 40 KT of PET bottles annually. We will continue to explore innovative business models to bring together the PET value chain and close the loop. On March 23rd 2020, IVL reached an important milestone of recycling 50 billion PET bottles globally! By 2025 we aim to recycle 50 billion PET bottles per year.

We believe education is the strongest communication tool to help us all understand that PET bottles are fully recyclable and how we can all play our part. In Thailand, we delivered educational programs to 51 schools under a 30-year program to teach children between the ages of 9-12. Including projects in USA, Mexico and Brazil, around 22,145 people have been involved in our circular economy awareness campaign. Going forward we will scale up our teaching program to reach a global audience. We want to make the sustainable choice, the easy choice.

In 2019, we launched DEJA™, our sustainable brand of recycled PET fibers, which is rolling out multiple products that will be lead differentiators in this category. DEJA™ will become a one-stop-shop for sustainable products in the polyester and PET circular economy giving both consumers and producers increased confidence through an innovative and low carbon material.

Our collaborations with industry partners and chemical recycling developers are resulting in revolutionary enhanced recycling technologies. Last year, in partnership with Ionika Technologies, The Coca-Cola Company and Circular Seas produced the first-ever "marine plastic bottles" for food and drink packaging using 25% recycled plastic retrieved from the Mediterranean Sea and beaches giving a new life to lower grade plastics destined for incineration or landfill. This is just one example of how we are incorporating breakthrough solutions, and we will continue to reshape and redefine the future of PET packaging, while exploring new business models to bring together the PET value chain and close the loop.

Our goal is to reinforce that PET is a trusted and safe material, and we are actively doing so through our numerous commitments and partnerships with associations that share our recycling vision – to create a circular economy around PET ensuring that bottles are not lost in the environment, landfilled or incinerated. To build on our own work, we have joined many associations around the world. Ellen McArthur's "New Plastic Economy" and "The Recycling Partnership" are typical examples of non-profits that contribute to increasing the collection rate of PET bottles in Europe and the US. The Minderoo Foundation is another collective group of industry partners that aims to make recycling products more economical.

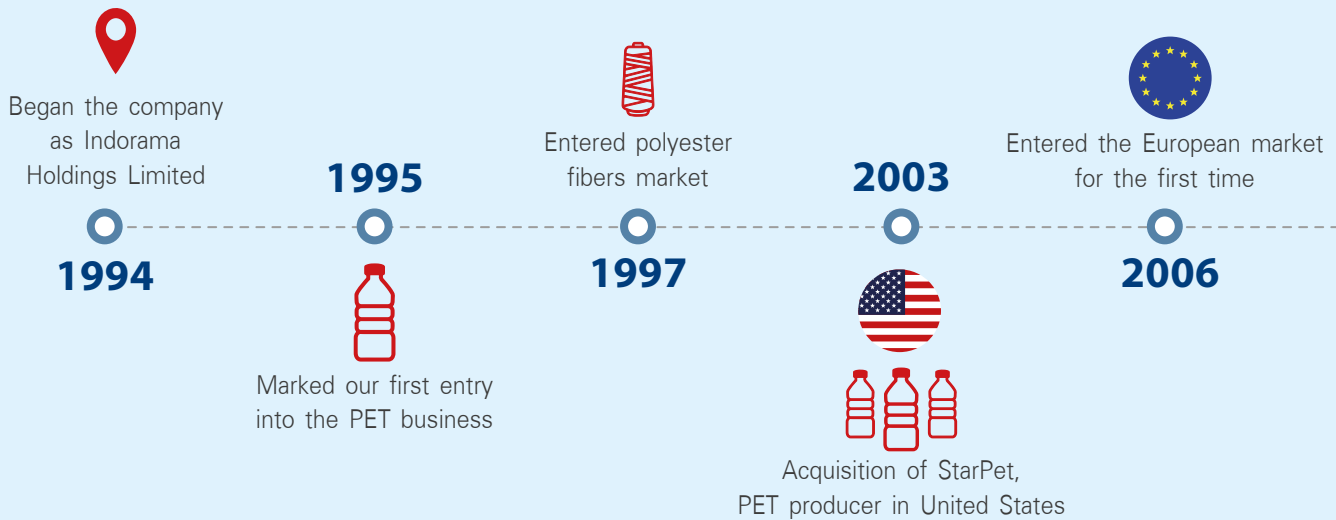
I would like to thank all our partners for pursuing this dedicated act and sharing the same vision. Thank you.



Yash Lohia
Chief Recycling Officer

Business Overview and Value Chain

Indorama Ventures' journey began in 1994. The group's rapid pace of growth and acquisitions continued in 2019, together with greater production efficiency, rising profits, and an increased focus on environmental sustainability. Its accelerated growth comes from the clear vision and strategy of our leadership, combined with a commitment to success on a global scale.



IVL Operating Sites*

as of 31 Dec, 2019



109

Sites

5

Continents

32

Countries

In 2019,

22

New sites

18

Europe

- Austria
- Bulgaria
- Czech Republic
- Denmark
- France
- Germany
- Ireland
- Italy
- Lithuania
- Luxembourg
- Poland
- Portugal
- Russia
- Slovakia
- Spain
- The Netherlands
- Turkey
- United Kingdom

7

Asia

- China
- India
- Indonesia
- Israel
- Myanmar
- Philippines
- Thailand

3

Africa

- Egypt
- Ghana
- Nigeria

1

South America

- Brazil

3

North America

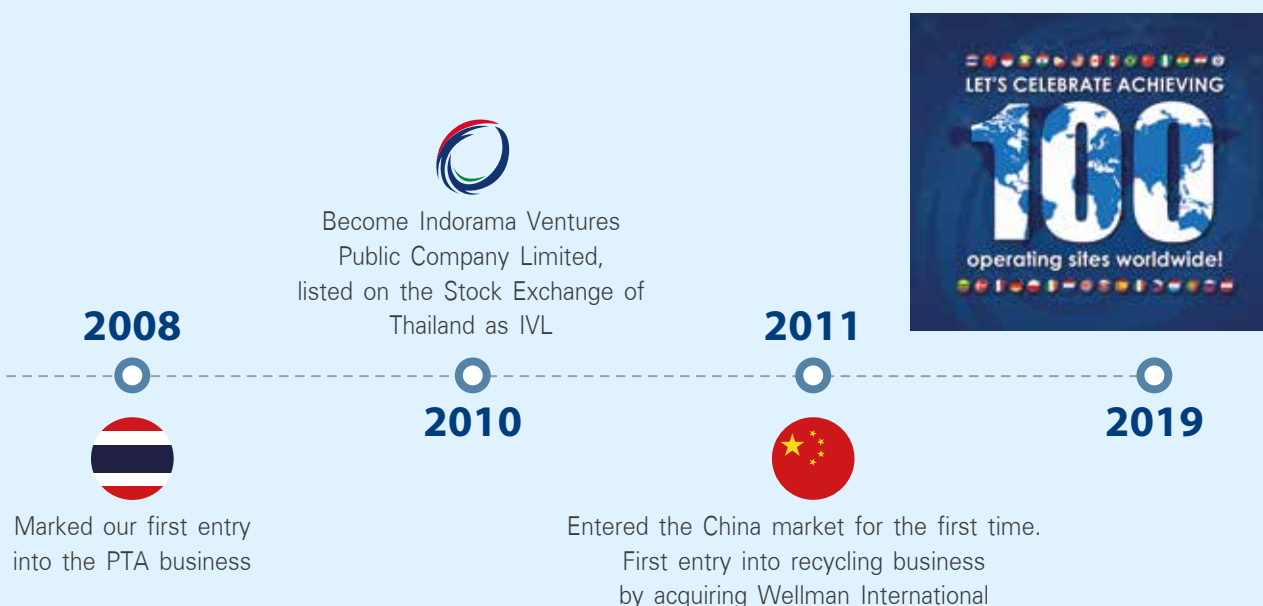
- Canada
- Mexico
- The United States

* Sustainability Report 2019 consists the data for 94 sites.

More details are given under 'About this Report' chapter of Sustainability Report.



For More Information



Business Segments



Integrated Oxides and Derivatives



2nd Largest
Ethylene Oxide producer in the US



Combined PET



1 in 5
PET bottles made from our PET resin



Fibers



1 in 2
Premium baby diaper made from our fibers



1 in 4
Airbags made from our yarns

Our Products



Feedstock

We integrated backwards to produce the upstream materials for the production of PET and Fibers.



PET

We offer products in different grades, including hot-fill, high and low intrinsic viscosity, quick heat and general grade, and etc.



Fibers

Our polyester and other types of fibers and yarns are used in the Automotive and Technical, Home and Apparel, and Hygiene and Medical segments.



Packaging

We offer raw materials for food and beverage containers and other consumables, comprising preform, bottle caps and bottles.



Recycled Products

Our recycled products are bottle flakes, recycled PET or rPET, and recycled fibers.

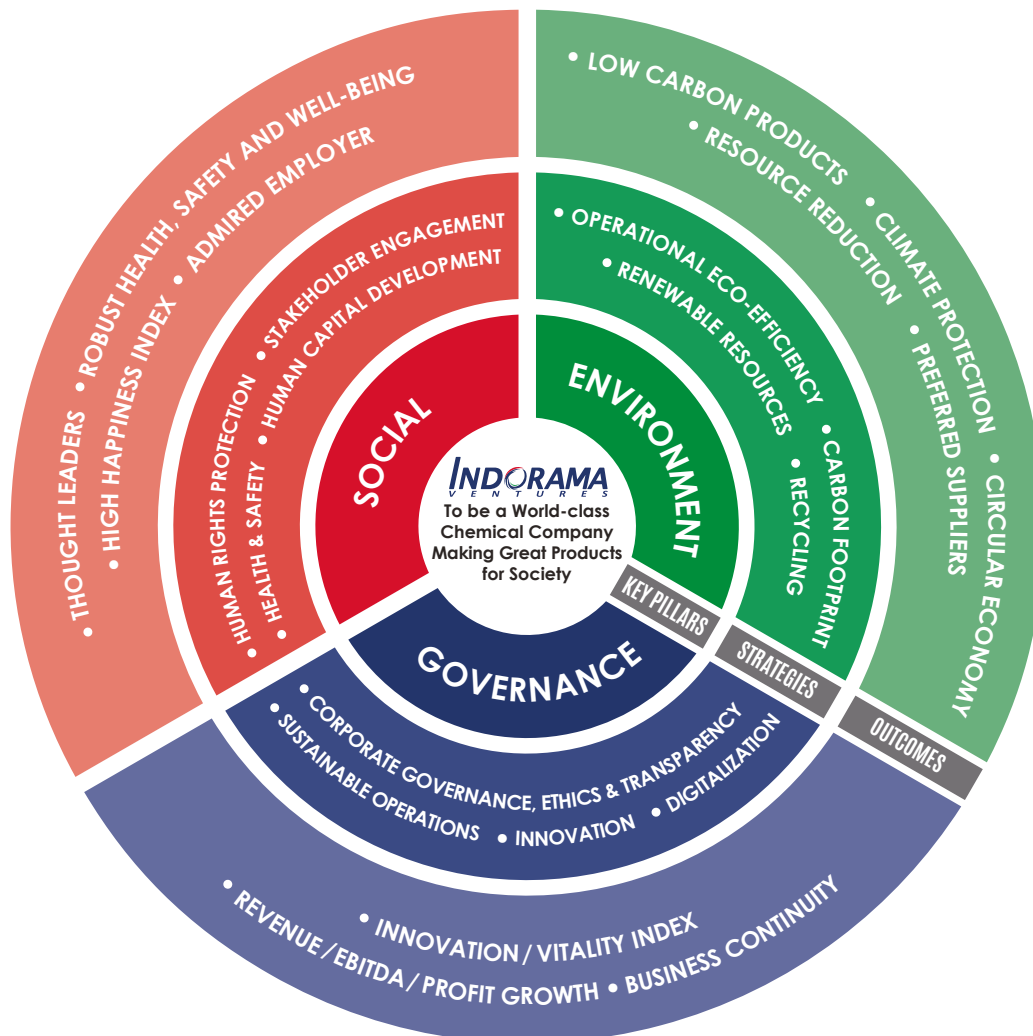


Wool

We began our first business in premium worsted wool yarns, using best-in-class machinery and the latest technology.

IVL's Sustainability Strategy

We realize in creating a culture where the workplace is a home away from home. Where together, we dream, aspire, create and celebrate a better everyday life for ourselves, our customers and society.



Environment – Responsible Operations

Our operations and products are focused on being environmentally-friendly, contributing to the circular economy, minimizing resource consumption and reducing emissions to fight climate change.



Social – Empowerment Culture

Our respect for human rights, engagement, investments in capacity building, and creating shared value for our stakeholders demonstrates our commitment to achieving long-term success.



Governance – Business Potential

Our business is based on our integrity and ethical principles, driving customer experiences through our innovative products and moving forward in meeting societal needs for sustainable growth and leadership.



For More Information

IVL's Sustainable Value Creation for Stakeholders

Our Capitals



4,582

Million USD
Total Equity

73.45

Million GJ
Energy Consumption

13.19

Million Tons
Raw Materials Consumption

65.22

Million m³
Water Withdrawal

33.06

Training Hours
per Employee
per year

170.67

USD
Training Expenditure
per Employee

22,696

Total Workforce

1,796,730

USD
CSR Contribution

33.20

Million USD
Environmental Investment

Our Business Model



Vision

To be a world-class chemical company making great products for society

Mission

We commit to be a responsible industry leader leveraging on the excellence of our people, processes, and technologies to create values for our stakeholders.

Values

- The customer is why we exist.
- Our people make the difference.
- We see change as an opportunity.
- Diversity is our strength.
- We are responsible.

Our Results



11.36

Billion USD
Total Revenue

387

Million USD
Core Net Profit
(After tax and NCI)

21%

Vitality Index
Fibers Business

35%

Vitality Index
PET HVA Business

90.97%

Employee
Engagement Score

86.58%

Customer
Satisfaction Index

12.34

Million Tons
Total Production

2.59

Million GJ
Renewable Energy

206,996

Tons
of PET bottles recycled

0.555

tCO₂e/Ton
of Production

TRIR = 1.45

Cases/200,000
Man-hours

LTIFR = 4.18

Cases/1,000,000
Man-hours

Key Highlights 2019

ECONOMIC PERFORMANCE

Total Production
(K Tons)



Vitality Index

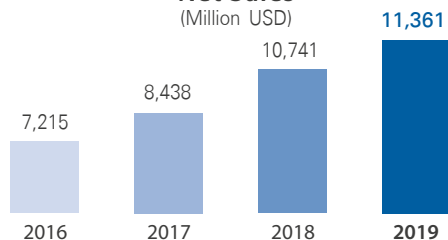


Fibers Business
21%



PET HVA Business
35%

Net Sales
(Million USD)

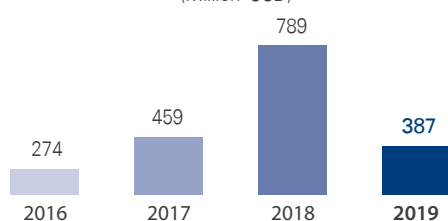


Customer Satisfaction Index (CSI) and Customer Retention Rate (CRR)

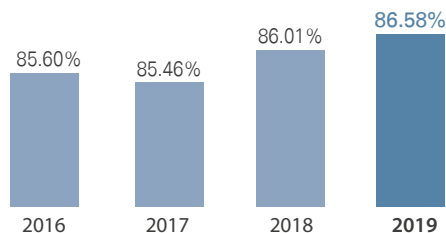
CSI
86.58%

CRR
93%

Core Net Profit
(Million USD)



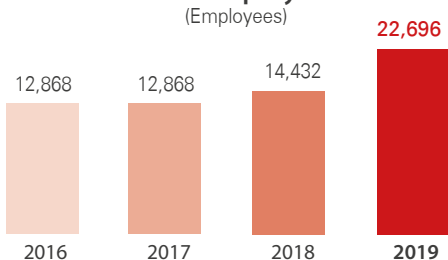
CSI



SOCIAL PERFORMANCE



Total Employees
(Employees)



TOTAL RECORDABLE INJURY RATE (TRIR) **1.45**
(Cases per 200,000 man-hours)

LOST TIME INJURY FREQUENCY RATE (LTIFR) **4.18**
(Cases per 1,000,000 man-hours)



Retention Rate

90.50%



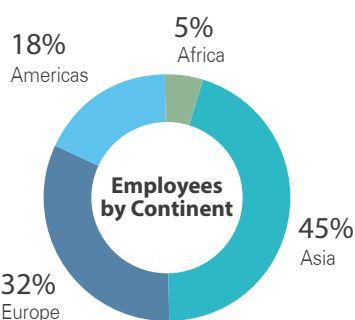
CSR Activities

612

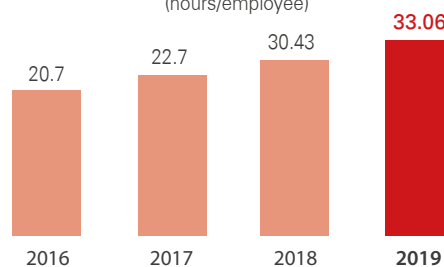


Human Rights Assessment in Workplace

100%



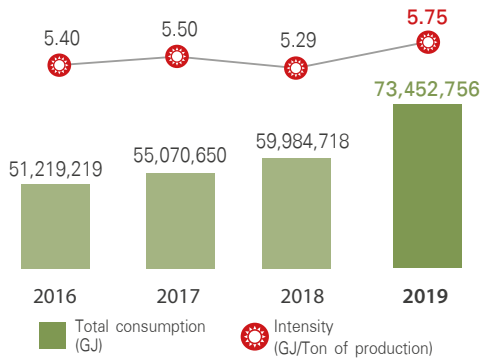
Average Training Hours
(hours/employee)



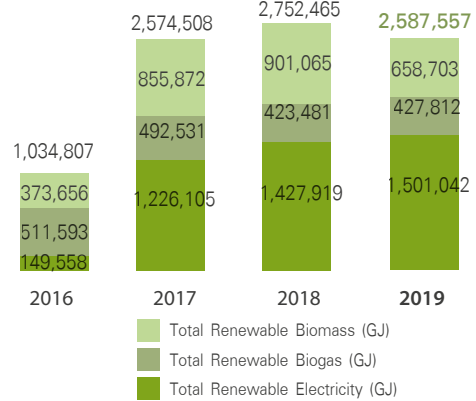
ENVIRONMENTAL PERFORMANCE

ENERGY MANAGEMENT

Total Energy Consumption

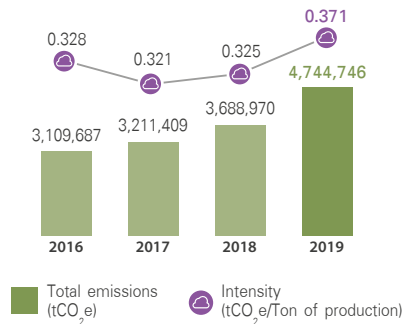


Total Renewable Energy Consumption

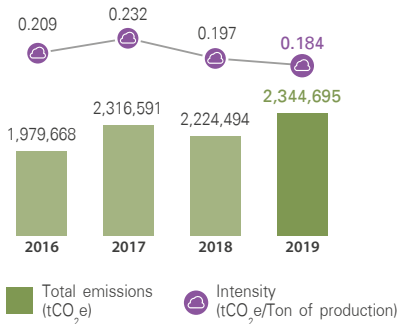


GHG MANAGEMENT

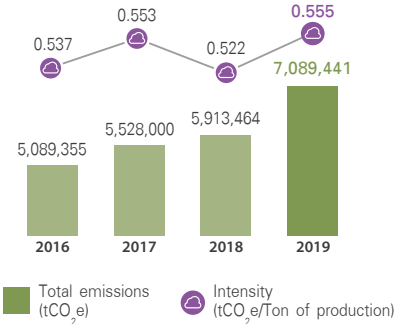
Direct GHG Emissions (Scope 1)



Indirect GHG Emissions (Scope 2)

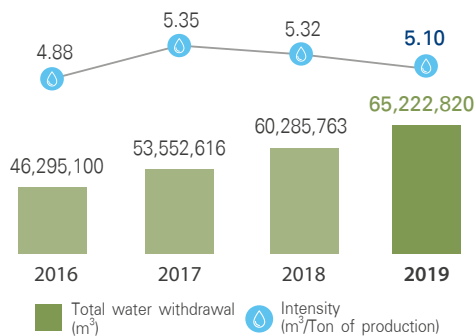


Total GHG Emissions (Scope 1 & 2)



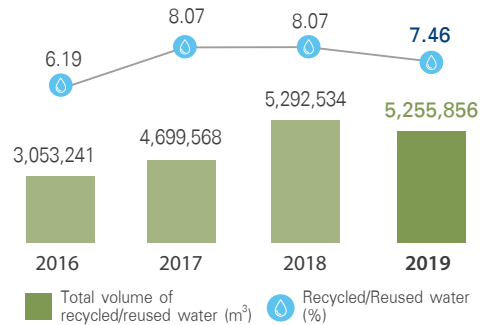
WATER MANAGEMENT

Total Water Withdrawal

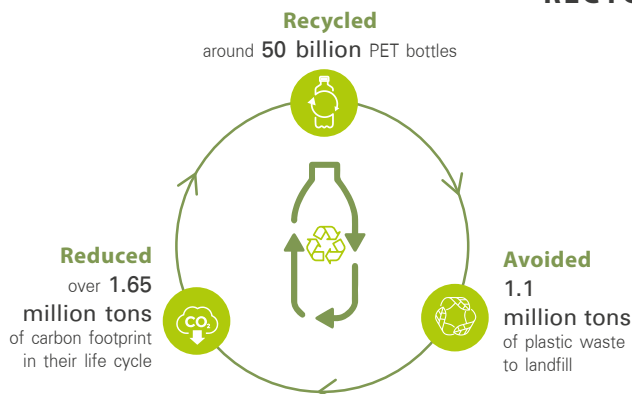


Water Recycled/Reused*

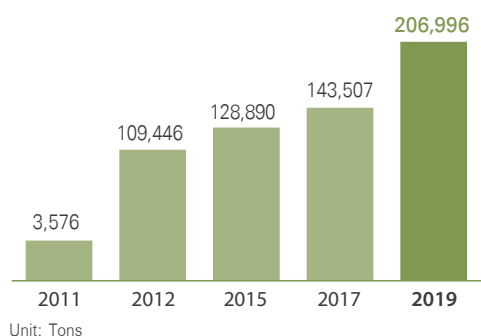
* Percentage of historical recycled/reused water intensities are restated due to change in calculation methodology.



RECYCLING



Post-Consumer PET bottles recycled



Sustainable Development Goals (SDGs) and IVL

Recycling & Circular Economy

3 4 6 8 12 13 14 15 17

- Developing ways to include recyclability into products and the circular economy into business and operations
- Bringing customers of recycled products into the product value chain cycle
- Partnering with organizations to intensify our contributions to the circular economy

Climate & Energy

7 11 12 13 14 17

- Being fully aligned with the global initiatives agreed at the COP21 towards developing the climate strategy
- Increasing the use of electricity from renewable sources
- Integrating TCFD analysis and recommendations



Environmental Stewardship

3 6 9 7 12 13 14 15 17

- Managing sustainable resources use and improving efficiencies
- Analyzing global water risk and scarcity
- Reducing the impacts from hazardous chemicals

Employees & Health and Safety

3 4 5 8 12 14 15

- Providing decent working conditions, equalities, and non-discrimination
- Providing learning and development opportunities
- Guaranteeing that health and safety are at the forefront of our activities



For More Information

Our Contributions	Outcomes	Our Commitments
3 *** 3.8 3.9 Guaranteeing the health and safety of our products, employees and contractors	<ul style="list-style-type: none"> Medical camp: 594 patients treated Operation Smile: 332 patients treated and 227 operations performed in three provinces in Thailand 	<ul style="list-style-type: none"> Increasing access to quality and essential health care services 10% reduction in the Total Recordable Injury Rate of our workforce in 2025
4 *** 4.3 4.4 4.5 4.7 Providing learning and development opportunities to all staff and promoting recycling education in society	<ul style="list-style-type: none"> STEM education and training to 58 students and 32 teachers 47 students received a higher level of education Recycling education to 13,149 students, 163 teachers and 22,145 people were involved in the awareness campaign in 2019 	<ul style="list-style-type: none"> Increasing STEM education, and student and teacher training Increasing involvement and participation in society through our recycling education campaign
5 * 5.1 5.2 5.5 Supporting gender equality and the increased participation and advancement of women	<ul style="list-style-type: none"> 22% female workforce 35% of women in managerial positions No human rights violations 	<ul style="list-style-type: none"> Increasing the numbers of women in managerial and leadership positions No human rights violations
6 ** 6.1 6.3 6.4 6.5 6.6 Managing sustainable water consumption and discharge, analyzing global water risk to minimize the water crisis	<ul style="list-style-type: none"> 100% of water is treated before being discharged 4% water intensity reduction in 2019 7.5% water reused / recycled USD 4,300 in water efficiency investments Water Stress Analysis through the WRI Aqueduct Tool Provided clean water and systems at schools 	<ul style="list-style-type: none"> 10% water intensity reduction by 2025 from 2019 levels Promoting sustainable water management Increasing access to safe drinking water for communities in rural areas
7 ** 7.2 7.3 Increasing the use of electricity from renewable sources where possible	<ul style="list-style-type: none"> 5% renewable electricity consumption increase over 2018 1.5 million GJ of renewable electricity purchased and generated Renewable energy (solar / wind) investments 100% renewable electricity in four operations 	<ul style="list-style-type: none"> Renewable electricity consumption: 10% by 2025 and 25% by 2030 Promoting sustainable energy efficiency
8 ** 8.4 8.5 8.6 8.7 8.8 Providing decent working conditions, a non-discriminatory environment and equal opportunities in our operations and supply chain	<ul style="list-style-type: none"> Complied with local minimum wages 90.50% retention rate Employed 198 persons with disabilities 17% of staff are in a younger age bracket (below 24 years old) 	<ul style="list-style-type: none"> Protecting labor rights and promoting a safe and secure working environment 10% reduction in the Total Recordable Injury Rate by 2025
9 ** 9.2 9.4 9.5 Empowering sustainable development through investments in manufacturing, innovation and technology	<ul style="list-style-type: none"> USD 13.8 million in R&D spending 162 R&D employees / 17 R&D Centers USD 15.2 million investment in GHG projects 80% of employees working in manufacturing 	<ul style="list-style-type: none"> USD 1.5 billion investment in recycling 10% combined GHG (Scope 1 and 2) intensity reduction by 2025 from 2019 levels Promoting investment in R&D and technology
12 *** 12.1 12.2 12.4 12.5 12.6 12.7 12.8 Reducing the impacts of our products in the use phase and promoting ways to include recyclability and circularity	<ul style="list-style-type: none"> 50 billion bottles recycled from 2011 to Mar 2020 Production of 206,996 tons of rPET 72% waste recovery 7.5% water reused / recycled Integrating the Circular Economy to IVL business 	<ul style="list-style-type: none"> Recycling 750,000 tons of post-consumer PET materials as feedstock per year by 2025 Recycling 50 billion bottles per year by 2025 Improving our operational eco-efficiency
13 *** 13.2 Improving resource use, energy efficiency, and developing strong low-carbon strategies	<ul style="list-style-type: none"> Reduced our carbon footprint by 1.65 million tons USD 33.2 million in energy efficiency investments Aligned the COP21 and TCFD frameworks and recommendations in our 2025 Climate Change Strategy Engaged with CDP: Climate / Supply Chain Management 	<ul style="list-style-type: none"> 10% reduction in combined GHG (Scope 1 and 2) intensity by 2025 from 2019 levels Collaborating with agencies to address climate change
14 * 14.1 14.4 Preventing, reducing and collaborating with like-minded organizations to address waste in the oceans	<ul style="list-style-type: none"> Recycled 1.1 million tons of PCR PET bottles from Jan 2011-Mar 2020 avoiding ocean pollution Restored fish stocks by releasing tilapia and probarbus in Rayong, Thailand 	Reducing ocean pollution by recycling 50 billion PET bottles per year by 2025
15 * 15.1 Reducing the risk of potentially adverse environmental impacts and monitoring the new areas near our operations	<ul style="list-style-type: none"> Supported the Wetlands Edge Environment Center in Alabama and their more than 400 acres of wildlife habitat Supported wildlife conservation (saving species and adopting animals) through the Asheboro Zoo in North Carolina Recycled 1.1 million tons of PCR PET bottles from Jan 2011-Mar 2020 avoiding PET pollution on land 	<ul style="list-style-type: none"> Protecting and restoring degraded forests and promoting sustainable ecosystems and biodiversity Reducing ocean pollution by recycling 50 billion PET bottles per year by 2025
17 ** 17.4 17.6 Partnering with organizations to intensify our contributions to achieve the goals and a circular economy	<ul style="list-style-type: none"> Global commitment to the Ellen MacArthur Foundation's New Plastics Economy United Nations / UN Global Compact International and local organizations and associations 	Partnering with organizations to intensify our contribution to sustainable development

Remarks:

*** = Major ** = Moderate * = Monitor = SDG Targets

Major Sustainability Awards & Recognitions

Our **achievements and recognitions** speak to the focused efforts of management, together with the outstanding commitment and efforts of our employees. It is important that we build on these successes and continue to aspire be “a world-class chemical company making great products for society.” The following are some of our key sustainability achievements:



- Indorama Ventures was **recognized in SAM's Sustainability Yearbook 2020 with the Silver Class distinction** and was listed in the Dow Jones Sustainability Indices (DJSI) - World and Emerging Markets.

- We were **ranked second** among the top global chemical companies.



- Indorama Ventures **achieved a B Rating** in the CDP's Climate Change Assessment in 2019 and B- (B Minus) in the CDP's Supply Chain Assessment in 2018.



FTSE4Good

- Indorama Ventures **remains a constituent of the FTSE4Good Index Series** following the December 2019 index review.

- We received a **Best ESG score** and stand at the **top of the group with a 100% percentile rank**.



- In 2019, Indorama Ventures **achieved Gold Recognition**, ranking in the **top 3% of companies** rated by EcoVadis in the **manufacture of basic chemicals**.

Bloomberg

- We **achieved the leading Bloomberg ESG disclosure score** among companies on the Stock Exchange of Thailand (SET50).



- Indorama Ventures was **graded BB** for the ESG rating in 2019.

- Indorama Ventures **achieved #3 percentile rank**



The company is at medium risk of experiencing material financial impacts from ESG factors, due to its medium exposure and strong management of material ESG issues. Furthermore, the company has not experienced any significant controversies.



- Indorama Ventures received the **2019 Thailand Sustainability Investment (THSI) Award** for the fifth consecutive year.



For More Information

Major Industry Associations and Memberships

As a leading chemical company, Indorama Ventures Pcl. demonstrates leadership in regards to driving sustainability development, innovation, product stewardship, creating positive impact on climate. Throughout 2019, we played an active role in various industry associations.

WE ARE A MEMBER OF SEVERAL INDUSTRY ASSOCIATIONS INCLUDING:

The Committee of PET Manufacturers in Europe (CMPE), Europe

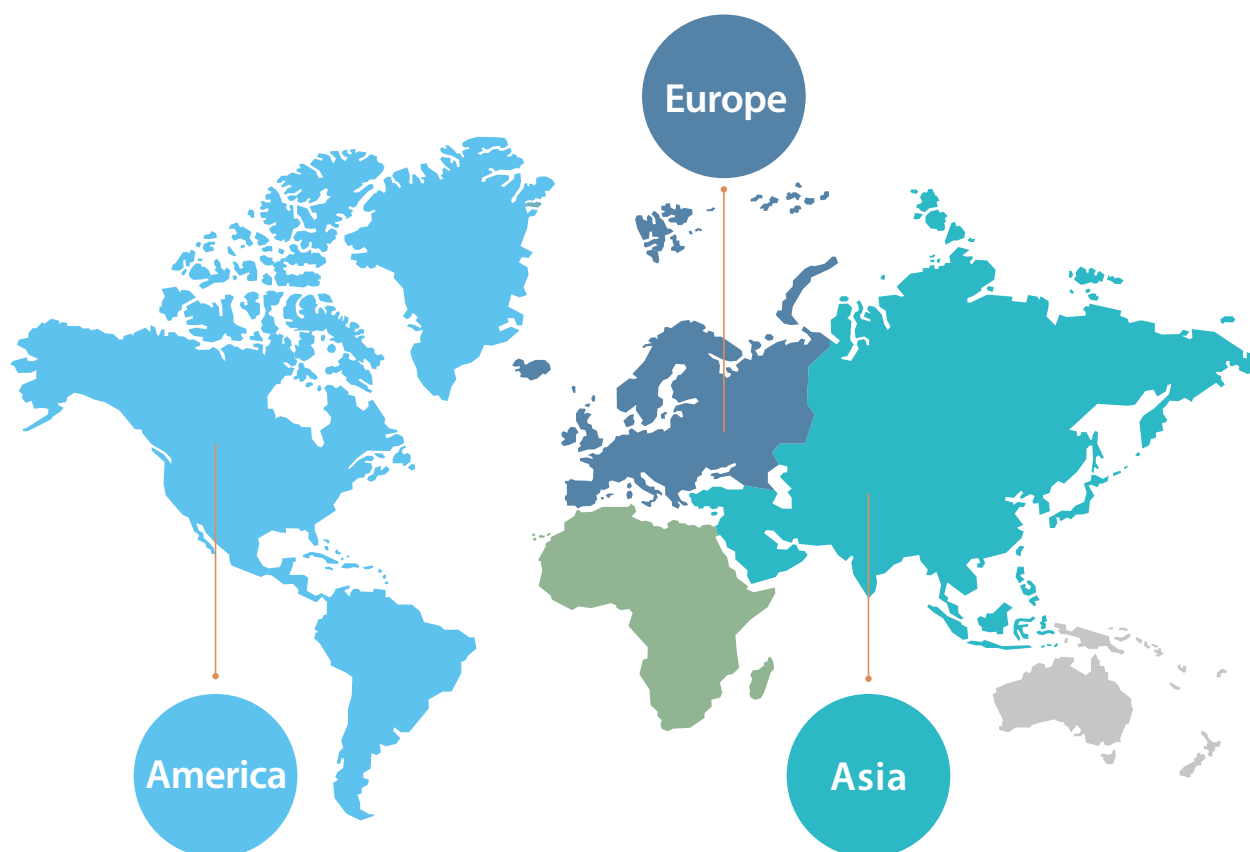
European Man-Made Fibres Association (CIRFS), Belgium

IVC - Industrievereinigung Chemiefaser e.V., Germany

World Economic Forum, Switzerland

Plastics Recyclers Europe (PRE), Europe

EDANA, Europe



Americas Fiber Manufacturing Association, USA

Association of Plastics Recyclers (APR), USA

PETRA - PET Resin Association, North America

National Association for PET Container Resources (NAPCOR),
USA, Canada and Mexico

Operation Clean Sweep, USA

The Federation of Thai Industries, Thailand

Thai Beverage Industry Association, Thailand



For More Information

Sustainability at Indorama Ventures

IVL's Sustainability Agenda

Sustainability at Indorama Ventures means achieving **business growth with positive environmental and societal impacts**; and effective management of the Triple Bottom Line – **Governance, Environment and Social**. This includes embracing economic, environmental and social risks, obligations and opportunities.

This commitment serves as the foundation of our overall business strategy. By **understanding the sustainability needs of our stakeholders**, we can accelerate development of new, more sustainable products not only to serve our customers, but also to meet our obligations for a circular economy and a greener planet fulfilling our values as a company. **An increased focus on sustainable operations in environmental and social dimensions**, especially in innovation management, product stewardship, and occupational health and safety, will help in **achieving our vision**.

IVL's Sustainability Governance

IVL drives sustainability from the top and has long recognized its importance. The **Board has embedded sustainability into the Company's overall long-term business strategy**, corporate culture and day-to-day operations through its subcommittee, the Sustainability and Risk Management Committee (SRMC).

The members of the SRMC possess in-depth knowledge and considerable expertise in sustainability and risk management. **The SRMC is the second highest authority relating to sustainability** and comprises nine members of the Board, including four Independent Directors.



For More Information



Indorama Ventures Portugal, Portugal

IVL's Sustainability Governing Structure

Board of Directors

Sustainability and Risk Management Committee (SRMC)



Mr. Alope Lohia
Chairman



Mr. Rathian Srimongkol
Member



Mr. Russell Leighton Kekuewa
Member



Mr. Kanit Si
Member



Mr. Tevin Vongvanich
Member



Mr. Dilip Kumar Agarwal
Member



Mr. Udey Paul Singh Gill
Member



Mr. Yashovardhan Lohia
Member



Dr. Deepak Parikh
Member

**Combined PET
Business**

**Integrated Oxides and Derivatives
Business**

**Fibers
Business**

During the year, Mr. Maris Samaram completed his term as a member of the Committee and did not opt for reappointment. The Board, at its meeting on May 8, 2019, appointed Mr. Tevin Vongvanich, Mr. Yashovardhan Lohia, and Dr. Deepak Parikh as new members of the Committee. The SRMC 2019 Report for shareholders detailing key activities during the year was published in our 2019 Annual Report.






Key Sustainability Initiatives in 2019

- Implementing **Environmental Stewardship** including initiatives on carbon footprint reductions and **Revisiting Targets and Plans** in accordance with sustainability mega-trends and organic business growth.
- Exploring a **Renewable Energy & Electricity Program** – Purchase and Renewable Energy Possibilities.
- Adopting the **Circular Economy** and exploring opportunities for **Zero Waste** (hazardous waste and water).
- Strengthening **Health and Safety Programs** including process safety, safety measurement and internal communications, and reporting systems.
- Streamlining the **ESG Supplier Evaluation** to ensure **Human Rights Protections** in the entire value chain.
- Phasing-out at risk chemicals in the **Hazardous Chemicals/Substances Management Plan**.

IVL's 2023 Strategy

As we weather the current low-point in the business cycle, we took the opportunity to develop **IVL's 2023 strategy** streamlining our approach into six categories and incorporating five strategic priorities – all of which will guide us in the decade ahead.

Our **vision**, to be a world-class chemical company making great products for society, defines us and remains the bedrock of our operations worldwide. Our **core values** speak to what we are as a company, adapting to change, being responsible, customer-centric and prizing our diversity and people. These values are as relevant today as they were in the past, and will continue to remain central to our success going forward.

Vision	To be a world-class chemical company making great products for society				
Values	 “We see change as an opportunity”	 “The customer is why we exist”	 “We are responsible”	 “Diversity is our strength”	 “Our people make the difference”
Financial Aspiration	Double-digit ROCE in each core business		Top decile TSR relative to peers		Strong cashflow across the cycle
Differentiators	Scale Global PET leader	Global-local Close to customers in global core markets	Integrated Value chain margin capture	Diversified Through cycle resilient portfolio	Serial M&A Programmatic, buy low, capture synergies
Strategic Priorities	Must do 1 Cost Transformation Accelerate performance through cost optimization	Thrusts - Diversification and Circular Economy 2 Asset Full Potential Focus on commercial excellence to grow revenues and margins			Enabler 5 Leadership Development Invest in and develop the best management team in the industry
Metrics	Lowest cost producer in core products	Industry-leading margins	Share of EBITDA from adjacency businesses	Leading rPET player in core markets	% of high-potential talent

As a result of our efforts over the past decade, we have some **unique differentiators** today. Our global scale, local presence, integration across the value chain, diversified sources of earnings, and mergers and acquisitions capabilities set us apart from our peers.

To build on these differentiators and further strengthen our leading position in the market, we developed **five strategic priorities**.

First, we are launching **Olympus, a company-wide cost and cash transformation** program to support our performance in this low-spread environment and position us for the next wave of growth.

Second, we will continue to drive the **full commercial potential** in each of our assets, to grow both our volumes and margins.

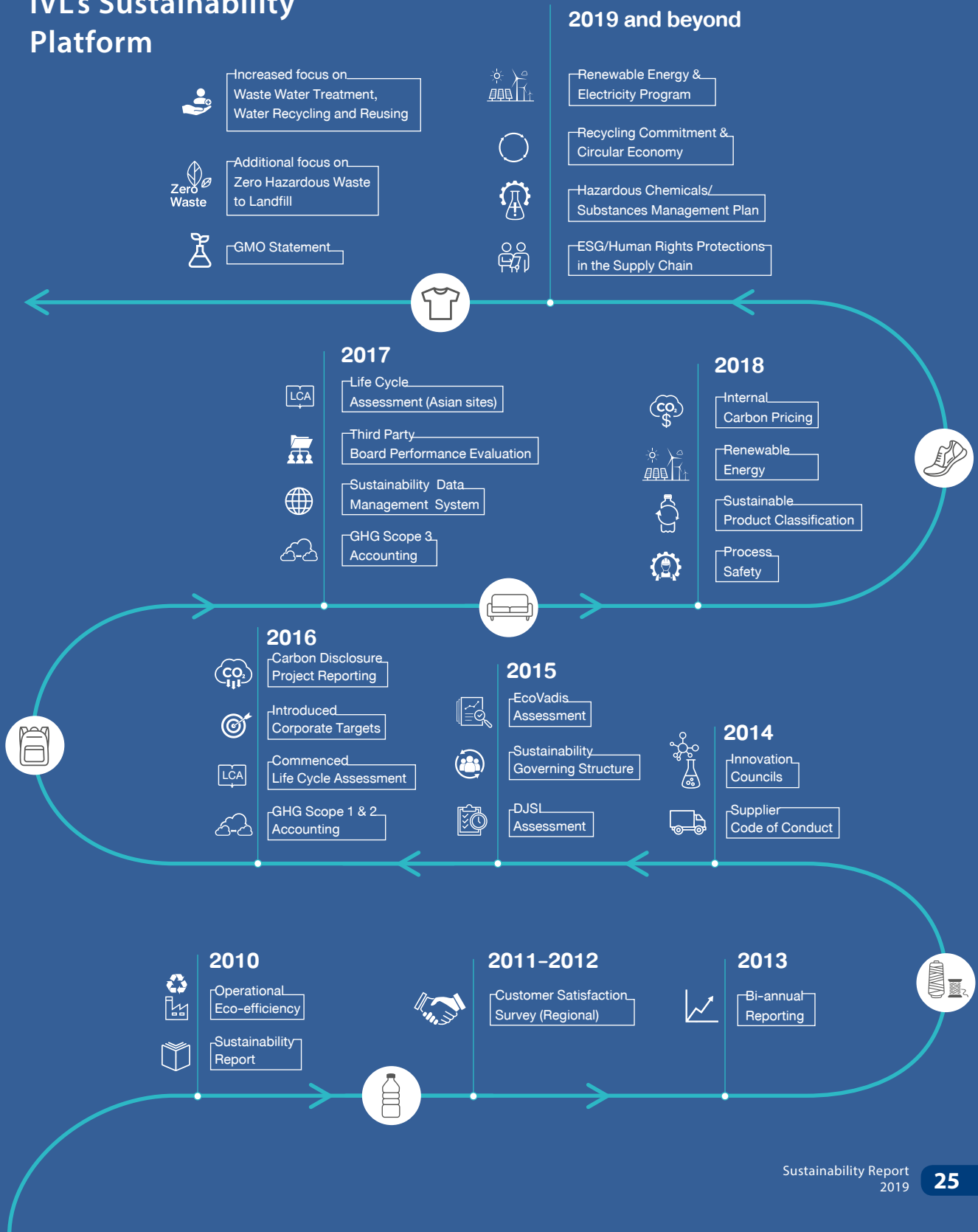
Third, we are exploring **selective adjacency opportunities** to our existing businesses, to incubate future engines of growth and innovation.

Fourth, we are doubling down on **recycling**, and aim to be the leader in PET recycling and set a new bar for sustainability in this important sector.

Finally, we recognize that all of this will only be possible if we are able to invest in and develop **the best leadership team** in the industry.

Each of these categories will ultimately contribute to our positive metrics, allowing us to maintain industry-leading margins, remain the lowest-cost producer in core products, become the leading rPET player in core markets, maintain a share of EBITDA from adjacency businesses, and develop a pool of high-potential talent positioned to support IVL's sustainable growth.

IVL's Sustainability Platform



Materiality Assessment

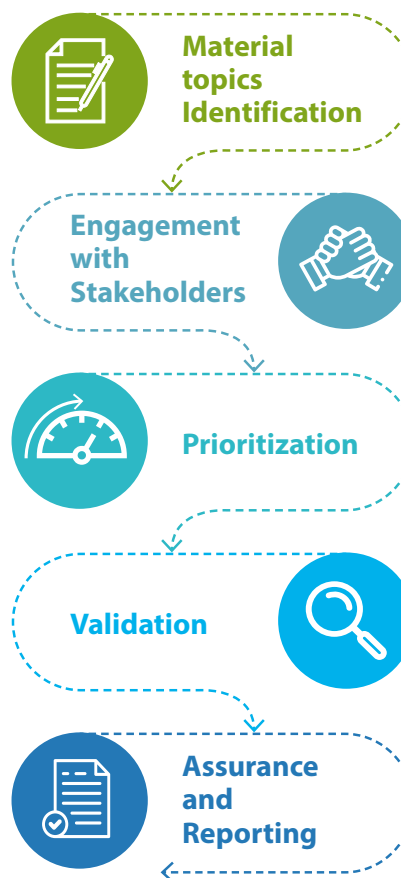
IVL annually refresh our **materiality assessment**, in 2019, we receive feedbacks and expectations from our stakeholders through various channels carried out a materiality assessment in accordance with the **GRI Standards**, together with our business strategy, and environmental and social priorities, **among our worldwide stakeholders for both internal and external stakeholders**.

Internal stakeholders include business and functional heads and external stakeholders include customers, suppliers, bankers, the media and employees.

We received information on **32 topics with potential relevance to IVL and external stakeholders**, rating them in terms of their current and future relevance. This helps us to develop risk mitigating actions and explore remedial opportunities. We aim to **create value by identifying opportunities and risks** from the materiality items and developing corresponding initiatives.

The range of influences on the assessments and decisions of stakeholders in each topic and the potential ESG impacts is presented in the **Materiality Matrix 2019**. Based on our assessment, the **key material topics for IVL and our stakeholders are totally 12 topics** (which Cyber Security was combined into Risk and Crisis Management) in the high-high shaded area.

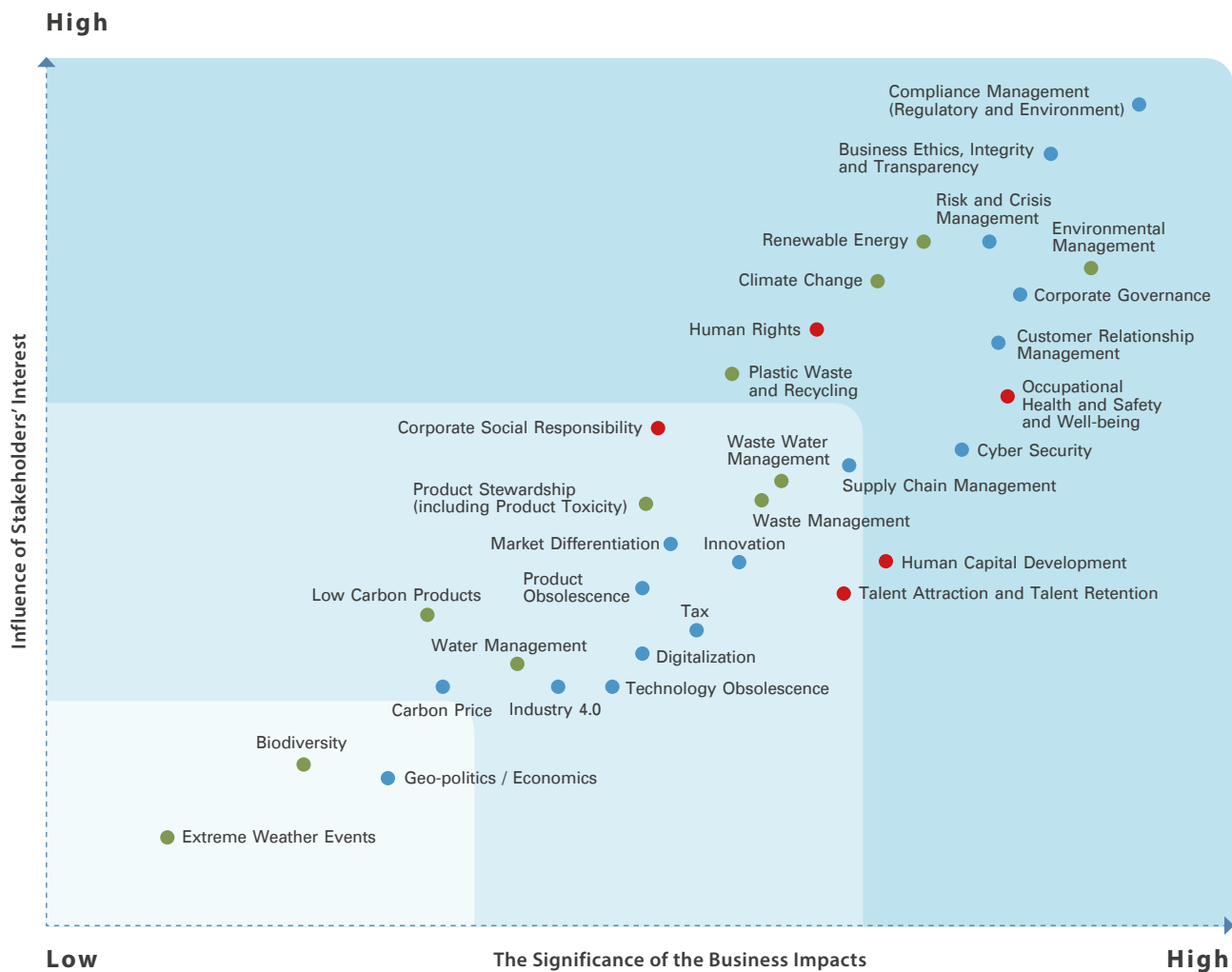
Materiality Assessment Process at IVL



For More Information



Materiality Matrix 2019



Key Material Topics

The materiality assessment sets out the twelve key material topics for 2019 and the content of this report. We used key elements of the GRI Standards to identify and prioritize the topics that matter most to the business and stakeholders and its impact boundaries.

12 Key Material Topics in 2019



GOVERNANCE

- Compliance Management
- Business Ethics, Integrity and Transparency
- Customer Relationship Management
- Corporate Governance
- Risk and Crisis Management



ENVIRONMENT

- Environmental Management
- Renewable Energy
- Climate Change
- Plastic Waste and Recycling



SOCIAL

- Human Rights
- Human Capital Development
- Occupational Health, Safety and Well-being

GOVERNANCE



Corporate Governance Business Ethics, Integrity and Transparency Compliance Management



We are committed to operating ethically, transparently, without bribery and corruption, throughout our global operations.



The Company successfully renewed its certification for Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) in May 2018. IVL received its first certification in October 2014.



No penalties were imposed on IVL in 2019 for material non-compliance with respect to corporate governance regulations.



The Company received an "Excellent - 5 Star" CG score carried out by Thai Institute of Directors (IOD) for **seventh consecutive year**.

Risk and Crisis Management

Emerging Risks



Failure to address anti-plastic campaigns



Disruptive innovation/technology



Water crises



Evolving sophistication of emerging cyber threats

Customer Relationship Management

CSI
86.58%

CRR
93%

Customer satisfaction measurement covered **100%** of global operations



Awards from Customers



Indorama Ventures received the "Sustainability Award" from Coca-Cola.



Petform (Thailand) was awarded the "Gold Award" from ThaiBev as part of the Business Partner Award Program 2019.

Innovation Management

Vitality Index*



Fibers Business
2019

Actual **21%**
Target **21%**



PET HVA Business
2019

Actual **35%**
Target **34%**



PHP Enka TecTape Hybrid Roving wins AVK Innovation Award



Trevira Fibers wins Brandenburg Innovation Award

* Vitality Index: Revenue generated from the sales of products developed during the last five years.



At IVL, good corporate governance starts at the top. The Board of Directors has the necessary tools, including the company's vision, mission, value statement, plans, strategies, key policies, and budgets too effectively and efficiently manage the business to achieve maximum shareholder value. Moreover, the Board closely monitors the management team and implementation of business plans to achieve the corporate targets, and sets internal controls and audit procedures, including risk management.

There are 16 Directors on the IVL Board comprising six Executive Directors, two Non-Executive Directors and eight Independent Directors. The Board, a reflection of IVL's diversity, does not discriminate based on gender or nationality, and hires according to availability and qualifications.

At the beginning of each year, the Board holds a "Strategy and Annual Business Plan" meeting where the vision and mission statement is reviewed along with the strategy as presented by management. Such meetings give the Board, and especially the independent directors, ample opportunities to interact with the respective executives and discuss the business plans and performance, to better understand the various businesses operated by IVL. Where necessary, suggestions are made by the Board.

The Board has guidelines on stakeholder business ethics as a part of the policies issued by the company, and monitors the effective implementation of good business practices and ethics using several tools, such as customer and supplier surveys, the results of employee training, and feedback surveys among others.



The Company received an **"Excellent - 5 Star"** CG score carried out by Thai Institute of Directors (IOD) for **seventh consecutive year**.



The Company successfully renewed its certification for Thailand's Private Sector Collective Action Coalition Against Corruption (CAC) in May 2018. IVL received its first certification in October 2014.

Every year, the Board evaluates the efficacy and sufficiency of the Company's internal controls by reviewing the Evaluation Form on the Sufficiency of Internal Control Systems for IVL and its subsidiaries which is initially reviewed by the Audit Committee and forwarded to the Board.

The Nomination, Compensation and Corporate Governance Committee (the "NCCG Committee") selects candidates with the highest personal and professional integrity, with exceptional and proven abilities and judgment, who can serve in the most effective capacity, together with the other committee members, in best serving the long-term interests of shareholders.

In addition, the NCCG Committee considers the appropriate mix of skills, education, experiences, independence, knowledge, and encompassing a broad range that matches with the Company's requirements.

In 2019, two additional directors were appointed to the Board in order to strengthen oversight in view of IVL's rapid expansion and growth. After due consideration of the business requirements and the profile mix of the current Board of Directors, the NCCG Committee and the Board of Directors recommended that Mr. Tevin Vongvanich be appointed as an independent director and that Mr. Yashovardhan Lohia be appointed as an executive director.

As of 31 December 2019, IVL did not have any independent female directors. However, in November 2019, the NCCG Committee decided that at its next meeting, in the interest of gender diversity, it would appoint a female candidate who will join in May 2020 following the annual general meeting of shareholders.



For More Information

Business Ethics, Integrity and Transparency

All corporate governance related policies and codes of conduct were reviewed, combined and restructured into one document, the Corporate Governance Manual (“the Manual”), to clarify our commitment and provide an improved understanding and more effective implementation. The Manual, approved by the Board in August 2019, provides all directors, employees and stakeholders with a clearer focus of how the Company’s values are being implemented and how corporate governance is being realized in the Company.

IVL has had a Corporate Governance Policy Awareness Campaign (CGPAC) since 2013. The CGPAC Committee has continuously monitored progress through a dedicated resource and provided the necessary guidance and support in establishing stronger awareness among all IVL associates so they better understand and implement all corporate governance-related policies through training in the spirit in which they were created. CGPAC is an ongoing program which involves communicating, training, conducting seminars and monitoring implementation.

With the introduction of the Manual, which was rolled out in September 2019, the CGPAC Team communicated the objectives and training guidelines across all units by:

- Translating the Manual into 20 regional languages through the local units. They are available in the Corporate Governance section of the Company’s website and are accessible to all employees.
- Developing and distributing the training package for the Manual to all units, including those which were newly acquired in 2019. The translated versions of the training videos included in the package were developed by request to provide a better understanding of the training content.



For More Information



- Conducting training sessions and meetings for teams who are responsible for communicating the importance of the Manual locally to ensure consistency in the training provided. Onsite trainings were conducted at all units in Thailand and three teleconference meetings were held for the remaining units around the world.
- Developing a training plan which outlines the proposed training until 2022.

All site heads are responsible for the implementation of the new Manual and report the results of the implementation to the CGPAC committee, who in turn, report the status to the Nomination, Compensation and Corporate Governance Committee and the Board.

Site/Human Resource heads ensure that all employees are informed about the Manual as soon as they join. This initiative has ensured that all new employees are aware of the program, and they are required to acknowledge that they have read and understood the Manual.

The CGPAC Implementation Report for 2019, which is based on the old version of our corporate policies and code of conduct, revealed that 80% of all employees have attended corporate governance training in the past three years with 68% of sites having 100% training coverage of their employees.

The Manual and related policies are reviewed annually. The CGPAC Committee submits their recommendations to the Board for changes to policies each year as required.

Anti-Corruption

The new Manual explains, among other things, the Company's strong position against bribery and corruption. As a global company, we aim to have the highest levels of governance and specified that we will abide by strict policies regarding corruption and bribery.

To demonstrate our firm commitment against corruption and bribery, the Board of Directors approved the Anti-Corruption Policy included in the new Manual. This policy provides a definition of corruption and explains the key practices in order to avoid any form of engagement.

IVL also adheres to all local, national and international laws where appropriate.

The CAC Certification was first received by the Company in 2014 and successfully renewed in 2018 for another three years.

Political activities and contributions

One IVL subsidiary made a political contribution in compliance with the applicable national regulations. However, the Company does not take any political position. We strongly recommend that our employees exercise caution when engaging with government personnel and political activities.

Other donations by IVL and our subsidiaries strictly follow a policy outlined by the CSR Committee and must be able to demonstrate having a positive impact. Additional information is available under "CSR Activities in 2019".



Compliance Management

Having operations in multiple countries and jurisdictions increases the risk of non-compliance, which is a major concern. The Regulatory Compliance System at IVL embraces compliance as an enabler of business performance, and has been integrated in the organization's risk management program. Through a top-down approach, the Sustainability and Risk Management Committee, the Audit Committee and senior management continue to advise all concerned on emerging risks and compliance requirements.

Whistleblower Policy

The Company has a "Whistleblower" policy that provides all employees with the opportunity to raise issues on any unethical practice (whether or not a violation of the law), to a Whistleblower Committee without necessarily informing their line managers or having to reveal their identities. This policy has been communicated to all employees globally and uploaded to the Company's website. Employees may contact the committee by e-mail at

- @ ethics@indorama.net, or by
- ☎ telephone or
- ✉ conventional mail directed to the Whistleblower Committee at IVL's head office in Bangkok.

In 2019, the CGPAC team launched another Whistleblower reporting channel by way of an independent website at: whistleblower.indoramaventures.com. The main objective was to provide another anonymous reporting option that would be more convenient, secure and easy to use and for better communications between the whistleblower and the Ethics Committee.



In return, the committee guarantees the protection of whistleblowers in that their identities remain confidential under all circumstances and no action will ever be taken against them for any reason whatsoever. This information has been provided to all business units.

In 2019, nineteen contacts were made to the Whistleblower Committee. Ten have been resolved while nine remain under an investigation. The results of the investigations and the actions taken were reported to the NCCG Committee and the Board of Directors.

The Whistleblower Policy and the reporting website are EU General Data Protection Regulation (GDPR) compliant.

As of 31 December 2019, there was no material litigation against IVL or our subsidiaries that had a negative effect on our assets exceeding 5% of shareholders equity. There was also no litigation that had a significant effect on our business.

Furthermore, during the reporting period in 2019, there were:

- No cases of material non-compliance.
- No cases or incidents of corruption or bribery; no employee, contractor or supplier was dismissed; and no contract with any business partner was terminated due to allegations of corruption.
- No legal cases involving corruption were brought against IVL or our employees.
- No complaints were reported concerning impacts to the public.

We are targeting the same outcomes for 2020.



For More Information

Risk and Crisis Management

To ensure that IVL remains resilient and responsive to challenges and opportunities with clear progress towards our organizational goals, we have embedded risk management as a mechanism to monitor and manage uncertainty. This allows us to understand principal business risks, explore new opportunities for continued and sustainable growth, and to adapt new strategies to mitigate any effects of a downturn in the global economy.

IVL's risk management process is based on the Committee of Sponsoring Organizations of the Treadway Commission (COSO) framework. An effective risk management structure provides strong support for risk management processes and their implementation. The Sustainability and 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.

Risk Assessment

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.

All significant risks which are identified are analyzed, recorded, reported and appropriate mitigation measures are initiated. The risk is assigned to the risk owner who is responsible for assessing risks and identifying associated controls to mitigate and/or reduce risk. Furthermore, continuous monitoring takes place including

supervising, critically observing, or determining the risk status in order to identify any performance level changes that are required or expected, to ensure that gaps are identified and that risk response and control activities are adequate and appropriate. The risk management report, together with the risk mitigation plan, is reviewed quarterly by sub-committees at the business segment and plant level. The SRMC reports to the Board periodically on its activities and evaluates its performance on an annual basis.

Sensitivity Analysis

At the corporate level, we conduct a sensitivity analysis every six months to ensure sustainability, especially on the environmental, social and governance impacts to our business operations covering strategy, operations, the environment, cybersecurity, and reputation.

We also conduct scenario analysis and Task Force on Climate-related Disclosures (TCFD) as guidelines on climate change. Sensitivity analysis covers the impacts on our production, revenue, and EBITDA.

Water sensitivity analysis is conducted to identify water stress locations at all of our operations globally using the AQUEDUCT Water Risk tool developed by the World Resources Institute (WRI). Risks relating to human rights in our workplaces and supply chains are also an important part of our risk management. Additional information on water and human rights risks is available in other chapters of our Sustainability Report 2019.

Risk Culture

We embed risk management in our operating processes. It is used day-to-day in executing our corporate strategy, daily activities and decision-making throughout the organization. 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.

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.

Improving risk culture is a continuous process that focuses on building cultural awareness, cultural change, and adopting improvements. IVL has increased training and awareness programs, from the Board through to the operational levels at our plants, including safety

training, safety observations, near-miss reporting rewards, knowledge-sharing systems to share lessons learned, and near-miss reporting through a variety of communication channels such as risk communication: a quarterly basis newsletter.

Emerging Risks

The failure to address anti-plastic campaigns may adversely impact the industry's growth potential			
Description	Potential Business Impacts	Potential Business Opportunities	Mitigation Measures
<ul style="list-style-type: none"> A significant rise in anti-plastic campaigns demanding a stop to producing single-use plastic. Governments being pressured to take meaningful steps towards reducing single-use plastic waste to help preserve the environment. Brand owners are also reacting, by making bold commitments targeted at managing waste from packaging. 	<ul style="list-style-type: none"> Concerns over the impact of plastic waste may threaten PET demand growth compared to historical trend line assumptions. A failure to address the challenge of global activism, governments, and brand owners' actions may present risks to our industry's growth potential and license to operate. 	<ul style="list-style-type: none"> The campaigns aid the company in disrupting the market by producing innovative, game-changing products and ideas that fundamentally change the way people live and work. Leveraging IVL's strong foundation in the PET market and geographic reach, we see vast opportunities to grow the POLYSHIELD® PET and OXYCLEAR® Barrier PET brands to their full potential by reaching out to both existing and new customers around the world. 	<ul style="list-style-type: none"> 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.

Disruptive innovation/technology potentially leading to vulnerabilities such as alternatives to PET

Description	Potential Business Impacts	Potential Business Opportunities	Mitigation Measures
Disruptive innovations or new technologies, which might outpace the company's ability to remain competitive. Resistance to change may restrict the company from making necessary adjustments to the business model and core operations.	<ul style="list-style-type: none"> Trend of eco-friendly substitutes for disposable plastic water bottles might be misunderstood to include recyclable PET, thus affecting the future use of PET. Advanced technology to invent alternatives for PET such as biodegradable plastic might make our business position vulnerable as one of the leading companies in the market. 	PET has become the top choice in the packaging sector. The environmental impact of PET is lower in comparison to glass, aluminum and other recyclable container materials. Being lightweight, PET saves resources, cuts costs and lowers environmental impacts during transportation. PET also generates a reduced carbon footprint by using less energy, creates fewer GHG emissions and generates less solid waste.	<ul style="list-style-type: none"> We work closely with brand owners to promote recycling campaigns and provide education to differentiate PET from other plastics. We recognize the strategic importance of research & development, choosing the appropriate level of investment, while also effectively measuring the return on those investments, which have meaningful impacts on our future positioning.

Water crises might result in a disruption of business operations and economic activity

Description	Potential Business Impacts	Potential Business Opportunities	Mitigation Measures
More severe climate change can lead to increased droughts and floods which may impact the company's entities as we operate in different geographic locations. The company will come under greater pressure to reduce water use and increase efficiency.	Increasing water scarcity can be a challenge and contribute to uncertainty given physical, financial, regulatory and reputational risks as the business focuses on securing long-term prosperity, to maintain a competitive advantage and differentiation, and to secure stability and optimal supply chains.	We can be a leader in water treatment by reducing fresh water consumption through our wastewater treatment plants. This can increase our water recycling and reduce fresh water intake alleviate concerns over water shortages.	<ul style="list-style-type: none"> A water sensitivity analysis was conducted to identify water stress locations, evaluate change in water demand & supply, risks from stakeholders and changes in regulations based on current and future conditions. We communicate on an ongoing basis and work with local authorities to check groundwater levels and levels in reservoirs in order to ensure a regular water supply and avoid any disagreements with nearby stakeholders.

The evolving sophistication of emerging cyber threats could have an adverse impact on our business financially and reputationally

Description	Potential Business Impacts	Potential Business Opportunities	Mitigation Measures
Cyber-attacks and other cyber incidents are occurring more frequently; are constantly evolving in nature; are becoming more sophisticated, and are being made by groups and individuals with a wide range of expertise and motives.	<ul style="list-style-type: none"> • We may suffer a loss or disclosure of confidential business or stakeholder information as a result of a breach of our IT systems. • We may suffer reputational, competitive and/or business harm; incur significant costs, and be subject to government investigations, litigation, fines and/or damages, which may adversely impact our business, results of operations, cash flows and financial condition. 	<ul style="list-style-type: none"> • Become a trusted partner for customers. Cyber security means putting customer trust at the center of competition. In digital businesses, one has to trust and be trusted (value and be valued). • Opportunity for continuous improvements. Cyber security is vital to the Digital Business Ecosystem and its continuity. • Leaders on safety, security, reliability, data privacy, and ethics will be the titans of tomorrow. 	<ul style="list-style-type: none"> • The SRMC and Audit Committee oversee cyber security risk management with policies and procedures that are aligned with the organization's strategy and risk appetite. • The Chief Strategy Officer, Chief Risk Officer and Chief Technology Officer oversee and encourage sustainably building an organizational culture of risk awareness. • Advanced threat protection measures are in place to ensure that our systems remain protected and that our security systems are robust. • Adopting emerging and modern AI-based protection technologies. • Network segmentation is planned to keep users, servers, and applications on different segments with inter-segment traffic passed through firewalls. • Ongoing assessments of security threats take place to ensure that security controls and countermeasures in place are commensurate with potential risks. • Disaster recovery and business continuity plans are in place to ensure that the business operates smoothly.



For More Information

Customer Relationship Management

IVL is a market leader in the polyester value chain. In order to maintain this position and drive consistent and sustainable growth, we believe that good Customer Relationship Management (CRM) is an integral part of our long-term success.

Customer engagement is our key strength. We continue to undertake new and constructive initiatives to drive our corporate culture and strategic partnerships to achieve consistent sustainable growth. We collaborate through various customer relationship channels with our customers to understand their needs and listen to their advice on regular basis. Our customer satisfaction survey is an important example where we survey customers to check on areas for improvement in regards to their expectations and evaluations of IVL. We then review those results as part of our efforts to better connect with them.

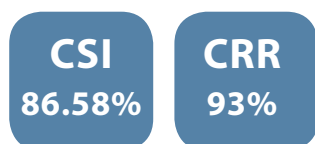
Based on an analysis of the survey results, we follow an improvement cycle that incorporates the feedback provided which allows us to improve customer satisfaction by implementing enhancements to our products and services.

In 2019, our Customer Satisfaction Index (CSI) reached 86.58%, increasing from 86.01% in 2018. Moreover, we received 1,535 responses from our global operations, a 19.7% increase from the previous year.

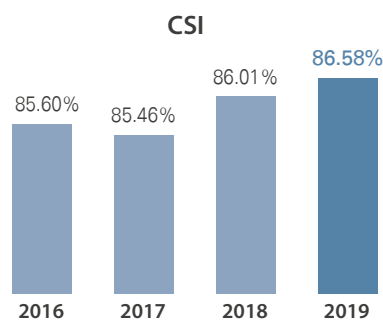
The study examined customer satisfaction from an all-inclusive perspective when doing business with IVL in relation to six factors, with deeper analysis of a total of 22 characteristics. The six factors covered are:



2019 Customer Satisfaction Index (CSI) and Customer Retention Rate (CRR)



Customer satisfaction measurement covered **100%** of global operations



Apart from the CSI, we take another step to comprehensively review our performance through the Net Promoter Score (NPS), which is used to measure customer loyalty and advocacy for IVL's business. In 2019, our NPS was 54, increasing 12.5% from 2018.

The study and its results are thoroughly analyzed in order to get an accurate sense of our CRM approach and spirit. We provide the survey results and feedback to business management meetings, establish and implement the necessary action frameworks across functions and use the relevant information to measure our business performance.

In addition, customers can anticipate our developments on innovation and products, as well as services, from the results. Our innovation teams take into account the needs of our customers in their R&D planning in order to achieve increasing customer satisfaction. This always drives our product and service innovation approach, which converge to ensure that we continue to achieve one of our values: the customer is why we exist. We support our customers with a broad range of products, applications and services leading to improved system performance. The following are two examples of our excellent product and service development in collaboration with our customers.

In 2019, there were no incidents of non-compliance concerning:

- Marketing communication
- Health and safety impacts of our products
- Breaches of customer privacy and losses of customer data

Indorama Ventures received the Coca-Cola Sustainability Award at Coca-Cola's Supplier Summit 2019 in Atlanta, Georgia.



IVL was recognized for its **commitment and responsiveness to Innovation and Sustainability**, particularly its ability to deliver solutions aligned with Coca-Cola's innovation pillars. The recognition also reflects the strategic alignment and strong partnership between the two companies in making products that **increase recycled content** and **reduce carbon emissions**.

The Sustainability Award was given to our **FuTuRePET®** Single Pellet Solution (SPS), which was developed and commercialized to increase recycled content in accordance with sustainability goals while maintaining high package performance standards.



Petform (Thailand) Limited, one of IVL's subsidiaries in Thailand, received the Gold Award from Thai Beverage Public Company Limited (ThaiBev).

One of Southeast Asia's largest beverage companies and the largest in Thailand, as recognition for IVL's outstanding performance. ThaiBev is currently one of the largest companies listed on the Singapore Stock Exchange and a member of the DJSI World and DJSI Emerging Markets Indices.

Presented as part of **ThaiBev's Business Partner Award Program 2019**, this award was given based on **quality, technical competencies, new product development, timely delivery, pricing, and sustainability** in the business operations of suppliers, and reflects the tremendous dedication of everyone at Petform (Thailand) Limited. This award was received at the ThaiBev Business Partner Award event on December 16, 2019.



For More Information

Innovation Management

IVL recognizes that innovation is crucial to its vision of making great products for society. It also pursues continuous improvements of its products and processes to keep pace with shifting market needs, to protect people and environment, and to incrementally improve our core business. With 17 R&D centers located globally, and 162 R&D employees, they have multiple functions to find better, safer, more cost effective ways to solve day to day problems and challenges of our customers.

We recognize its importance and engage with technology providers, customers, and suppliers to develop new products and processes to create customer value. Innovation in IVL focuses on new products and solutions to our customers by responding to their ongoing requirements and anticipating their future needs by rapidly as well as serving social and environmental needs. We aim to play a leading role in bringing customers of recycled products and recyclability into all our products. Our achievements in sustainable development demonstrate our leadership in promoting sustainability throughout the value chain and towards the circular economy.

Vitality Index*



Fibers Business

2019

Actual **21%**

Target **21%**

2020

Target **23%**



PET HVA Business

2019

Actual **35%**

Target **34%**

2020

Target **34%**

* Vitality Index: Revenue generated from the sales of products developed during the last five years.



The Indorama Ventures/Loop Industries partnership to become a reliable world leader in the “Circular Economy” for being 100% sustainable with recycled PET resins and polyester fibers

Indorama Ventures Plc.’s world-class manufacturing footprint and Loop’s proprietary science and technology launches a commercial solution for consumer packaged goods companies in response to the rapid growth in global plastic consumption for which there is a great need to responsibly collect and reuse these materials. Through this joint venture, Indorama Ventures and Loop Industries will be able to perpetually recycle the ever increasing amounts of PET plastic and polyester fiber proving the promise of and encouraging the shift to a circular economy.

Multi-year Supply Agreement with Beauty Leaders

This collaboration marks an important step to help brand owners, customers and consumers move towards a circular economy of PET packaging.

L'ORÉAL
PARIS

Supply PET resin made of 100% recycled materials for L'ORÉAL packaging needs

L'OCCITANE
EN PROVENCE

L'OCCITANE will meet its 100% recycled bottles goal ahead of schedule

Multi-year 100% Sustainable PET Packaging Supply Agreement with Food & Beverages Brands



Danone will purchase 100% sustainable and upcycled Loop-branded

PET from Loop’s joint venture facility with Indorama Ventures Limited in the US, for use in brands across its portfolio including evian®, Danone’s iconic natural spring water.

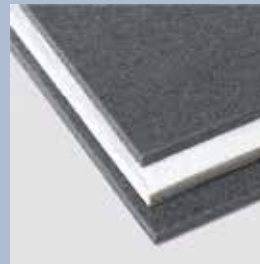


Upcycled Textiles Engineered Materials Designed for Circularity

Responding to the urgent global issue of waste, Really upcycles textiles to create materials that challenge the design and architecture industries to rethink their use of resources and to design their products with a circular economy in mind.

Solid Textile Board and Acoustic Textile Felt by Really are high-quality engineered materials made from end-of-life cotton and wool that is sourced from fashion and textile industries, industrial laundries and households.

These are thermally bonded with binder fibers supplied by IVL avoiding the use of chemical binders. The manufacturing does not involve the use of dyes, water or toxic chemicals and generates only recyclable waste. The mechanical properties of the solid textile board allow it to be used as a substitute for wood and composites in furniture and architecture.



Acoustic Textile
Felt Forming



Solid Textile
Board Forming

Enka TecTape Hybrid Roving wins AVK Innovation Award



Indorama Ventures has been recognized for our work in Fibers with the AVK Innovation Award during the Composites Europe Fair 2019, which was supported by the German government.

The project target was the development of a lightweight car seat with PHP Fibers' Enka TecTape Hybrid Roving. The fiber was highly malleable and the manufacturing process, using only two tools, was hailed as trendsetting in terms of resource efficiency and economy, making the application potential tremendously high. The car seat itself was designed by Brose and we look forward to seeing the next step of production with them.

Trevira wins Brandenburg Innovation Award

Trevira has been named winner of the "Brandenburg Innovation Award for Plastics and Chemistry 2019" by the Brandenburg Ministry of Economic Affairs for its flame retardant, UV-resistant polyester yarn. The yarn, which is available in a variety of colours, is specially designed for outdoor applications.



For More Information

ENVIRONMENT



3 GOOD HEALTH AND WELL-BEING



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



8 DECENT WORK AND ECONOMIC GROWTH



10 REDUCED INEQUALITIES



11 SUSTAINABLE CITIES AND COMMUNITIES



12 RESPONSIBLE CONSUMPTION AND PRODUCTION



13 CLIMATE ACTION



14 LIFE BELOW WATER



15 LIFE ON LAND



17 PARTNERSHIPS FOR THE GOALS



Environmental Stewardship

We recognize the need to continue improving our environmental performance by improving operational efficiencies, increasing the use of renewable energy and complying with environmental laws, regulations, and standards to achieve zero material non-compliance issues. We are aware of legislation that may be introduced going forward that can negatively impact our business if we are not proactively taking the lead in protecting the environment. We want to ensure that we have no negative impact on the communities where we operate.

Environmental Compliance

The aim of our corporate values and Environmental Policy is to protect and enhance the environment around us. We have a consistent and organized environmental compliance management system in place and are proactive throughout the year in ensuring that our operations are in accordance with all applicable environmental laws, regulations, and standards applicable to the countries where we operate. IVL subsidiaries go further by adhering to 'Responsible Care', a voluntary commitment by the global chemical industry to drive continuous improvements and achieve excellence in environmental, health and safety, and security performance. IVL aims to stay ahead of the curve by going beyond conventional compliance requirements. In order to grow sustainably, we use the criteria set out in our environment policy when conducting due diligence prior to mergers and acquisitions as well as when planning greenfield projects and expansions.

In alignment with our sustainability objectives and to support our commitment of having no major environmental non-compliance, we have performance-based incentive programs for senior management, heads of plants and concerned EHS managers.

We keep hazardous air emissions and waste from our operations within regulated limits and continuously monitor the impacts of all our products on the health and safety of our workforce, customers, and others who handle them in the value chain and regularly analyze the results for improvements.

In 2019, there were no incidents of major regulatory non-compliances (greater than USD 100,000) under our reporting scope. Management has issued additional guidelines to ensure full compliance given our stated commitment to protecting the environment.



2019 Target:

- No major cases of environmental non-compliance

2019 Achievement:

- No major cases of environmental non-compliance
- No monetary or non-monetary sanctions against IVL

2020 Target:

- No major cases of environmental non-compliance



Environmental Management

IVL is committed to effectively addressing and managing our environmental footprint and the impacts of our operations and our supply chain. The Environmental Management System is an important tool to manage the impacts of our activities on the environment. It provides a structured approach to planning and implementing environmental protection measures and enables us to achieve the following benefits:

- Setting up and reviewing environmental goals and targets
- Setting up targets for renewable energy procurement for GHG emissions reductions
- Environmental stewardship through operational eco-efficiency, resource conservation, and identifying opportunities for improvements and cost reductions
- Ensuring environmental compliance
- Enhancing employee morale, and our standing with external stakeholders
- Increasing employee awareness of environmental issues and responsibilities

By improving our operational eco-efficiency, process optimization and process innovation, we are demonstrating our commitment to protecting the environment through reductions in greenhouse gas emissions (GHGs), air emissions and ensuring certification of all our operating sites to the ISO 14001 standard. This helps to ensure standardization across all sites with respect to environmental management.

"IVL is committed to operating in compliance with all applicable regulatory, reputational and/or market risks related to climate change, and reducing GHG emissions".

IVL Certification Status

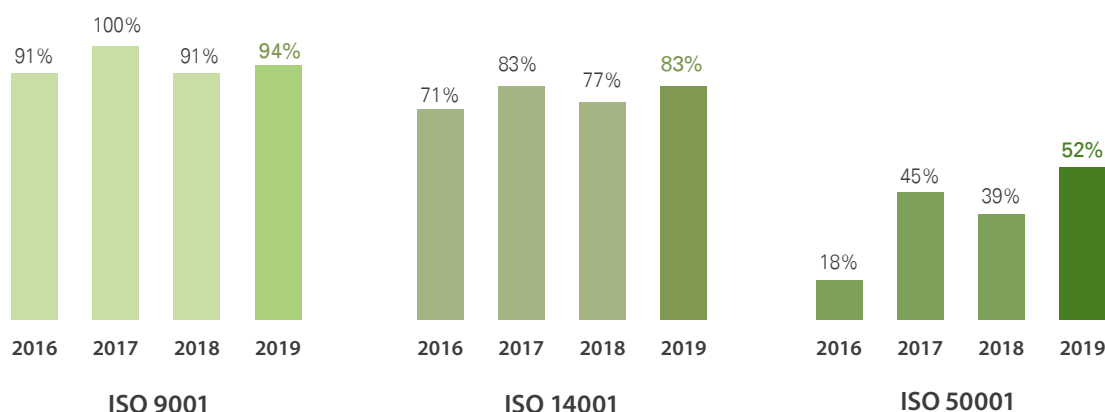
Certification status against the 2020 Target*

Certification	2020 Target	Status as of Dec 2019
ISO 9001	100%	99%
ISO 14001	98%	85%
ISO 50001	98%	57%

* Applicable for sites which were a part of IVL Group as of Dec 2018 (72 sites).

As of December 31, 2019, 83% of our operation (out of 94 sites) have ISO 14001 Environmental Management certification and 52% have ISO 50001 Energy Management certification.

IVL Certification Status (as of 31 Dec 2019)



Note: 2019 reporting scope (94 sites)

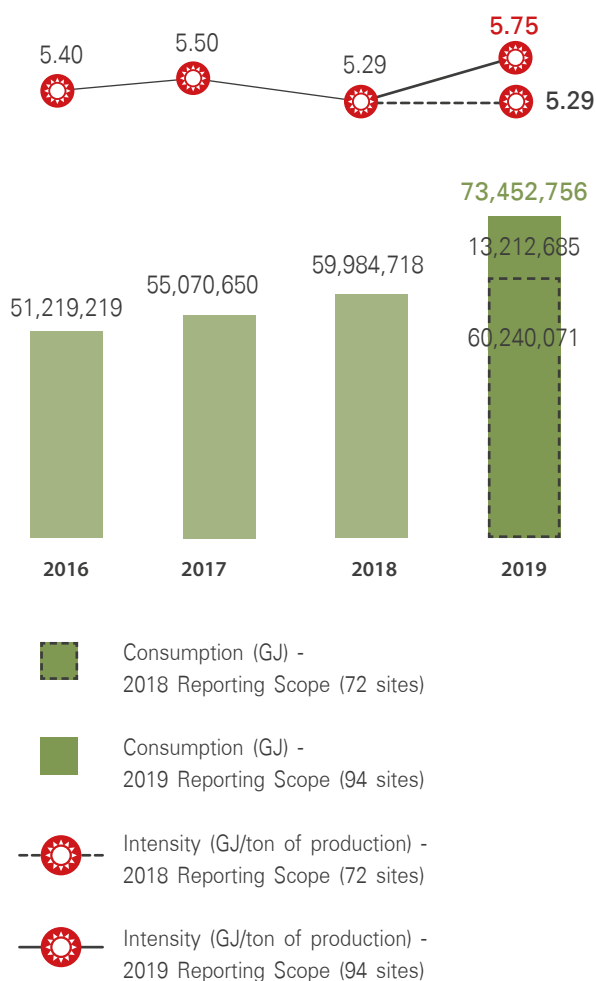
Energy Management



IVL has been undertaking many energy saving initiatives concurrently. Our focus on energy efficiency has continued to increase as this further helps the Company's competitiveness by reducing energy costs and impacts through solutions for a low-carbon economy, and dealing with climate change.

In 2019, there were 56 energy efficiency projects which delivered approximately 756,216 GJ in energy savings and a 44,733 reduction in tCO₂e. However, our overall energy intensity increased 8.7% over 2018 due to the high energy intensive units of new acquisitions. Nevertheless, with the same plant reporting scope as in 2018, we could maintain our energy intensity at the same level at 5.29% and we continuously explore options to further reduce our energy intensity.

Total Energy Consumption



Note: Intensities are calculated based on overall production including inter-company sales.



2019 Target:

≤ **5.29** GJ/ton of production

2019 Actual:

5.29 GJ/ton of production
(for 2018 Reporting Scope (72 sites)
i.e. excluding 2019 acquisitions)

5.75 GJ/ton of production
(for 2019 Reporting Scope (94 sites)
i.e. including 2019 acquisitions)

2025 Target:

5% reduction in energy intensity
from 2019 levels



Wellman International Ireland, Ireland



For More Information

Renewable Energy

IVL looks for opportunities to replace fossil fuels used in our own processes. We are increasing the use of renewable electricity across our business as natural resources are finite and we recognize the need to lower our dependency on carbon-based energy production. Four of our plants, Orion Global Pet in Lithuania, Indorama Ventures Quimica in Spain, Wellman International in Ireland, and UTT Technische Textilien in Germany use 100% renewable electricity. In addition to our Indorama Holdings in Thailand, this year, we have also completed three new solar rooftop installations: Indorama Polyester Industries – Nakhon Pathom in Thailand (840 kWp), Avgol in India (740 kWp), and IVL Dhunseri Panipat in India (1,000 kWp). Further solar rooftop projects are in progress and will be completed in 2020.

In 2019, the renewable electricity purchased by IVL was approximately 5% higher than in 2018. We continue to explore further possibilities to increase our use of renewables, and remain committed to sourcing more electricity from renewable sources for our sites. IVL joined the Renewable Electricity Buyers Alliance (REBA) to gain a better understanding of the renewable electricity market. We are exploring the option of renewable electricity procurement through a global Virtual Power Purchase Agreement (VPPA) to further reduce our GHG emissions. This is in line with our commitment to the Paris Agreement and our GHG emissions target.

Our combined use of 2.58 million GJ of renewable energy resulted in a savings of over 184,460 tCO₂e. We also consumed biogas and biomass as alternative renewable fuels in our processes. In 2019, our biomass consumption increased 1% from the 2018 level.

Highlights

5% increase in renewable electricity purchases from 2018



For More Information



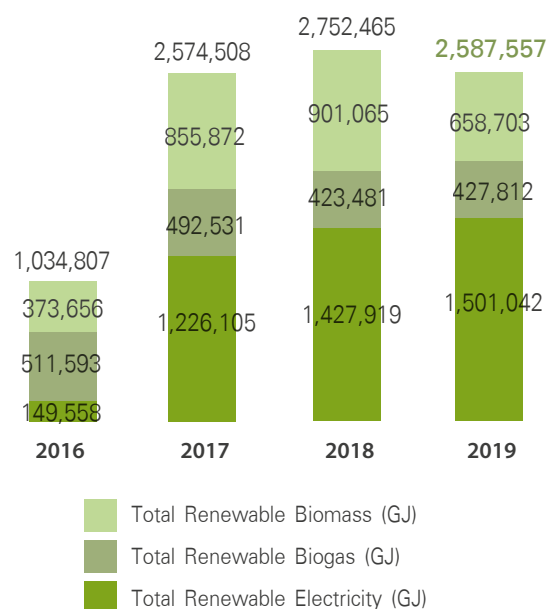
2025 Target:

10% renewable electricity consumption

2030 Target:

25% renewable electricity consumption

Total Renewable Energy Consumption



Solar Farm in Lopburi sites, Thailand



Clean and Renewable Electricity Supply from Solar Modules

Indorama Polyester Industries (Nakhon Pathom), Thailand, or IPI – N, a wholly-owned subsidiary of the Company, demonstrated its green credentials by installing photovoltaic modules for captive solar power generation on the roof of their facility. These high efficiency modules have a capacity of 840 kilowatt peak (kWp) and can generate an estimated 1,173 MWh per year. The advantages from this inexhaustible energy source are clear from a financial and environmental perspective, as they provide an annual electricity cost-savings of roughly

USD 122,000 with a reduction in CO₂ emissions of 560 tCO₂e/year. They were installed and started operating in July 2019. Total electricity generated in 2019 was 565,327 kWh which reduced 270 tons of GHG emissions. It reduced energy consumption from other conventional sources by 2,035 GJ and contributed to electricity cost-savings of USD 58,788. IPI – N's photovoltaic modules are an important step in reducing utility costs and greenhouse gas emissions.



GHG Management

Greenhouse gas emissions from our operations are primarily related to the fuel and power we use. We are actively working to reduce our carbon footprint across the value chain to improve our resource productivity and reduce our environmental footprint. We are, therefore, committed to reducing greenhouse gas emissions from our operations in a manner that supports national strategies and is in-line with our commitment to our stakeholders to operate a sustainable business and finding pathways towards developing effective low-carbon strategies to alleviate the activities that cause climate change. In addition to our Climate Strategy 2025, we developed a Climate Strategy Corporate Standard that guides our global operations in terms of best practices for the climate, including GHG management, with key actions and KPIs.

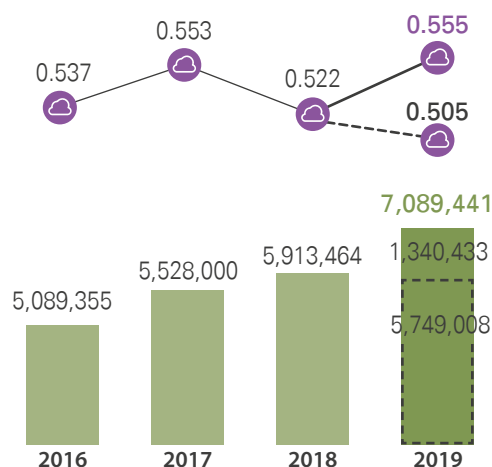
We have thoroughly analyzed the greenhouse gas emissions from our operations and implemented comprehensive reduction measures. We calculated direct and indirect greenhouse gas emissions (GHG Scope 1 and 2) for all of our operations globally in accordance with the GHG Protocol on Corporate Accounting and Reporting by the World Resources Institute (WRI) / World Business Council for Sustainable Development (WBCSD), ISO 14064-1 and ISO 14064-3. We also track and report our GHG Scope 3 emissions globally for selected criteria.

In 2019, our GHG intensity for reporting entities (72 sites) declined by 3% compared to 2018, to 0.505 tCO₂e/ton from 0.522 tCO₂e/ton of production. However, our overall GHG intensity increased by 6.5% over 2018 due to the high energy intensive units of new acquisitions in 2019.



For More Information

Total GHG Emissions (Scope 1 and 2)



- GHG Emissions (tCO₂e) - 2018 Reporting Scope (72 sites)
- GHG Emissions (tCO₂e) - 2019 Reporting Scope (94 sites)
- Intensity (tCO₂e/ton of production) - 2018 Reporting Scope (72 sites)
- Intensity (tCO₂e/ton of production) - 2019 Reporting Scope (94 sites)

Note: Intensities are calculated based on overall production including inter-company sales.

GHG Scope 1 and 2 verification:

The information on GHG Scope 1 and 2 emissions has been verified by an independent external assurance auditor, TUV Nord GmbH, in accordance with GHG Protocols, ISO 14064-1, and ISO 14064-3.



GHG Intensity:

2020 Target:

6% reduction in combined GHG (Scope 1 and 2) intensity from 2013 levels

2019 Actual:

0.505 tCO₂e/ton of production
(for 2018 Reporting Scope (72 sites)
i.e. excluding 2019 acquisitions)

0.555 tCO₂e/ton of production
(for 2019 Reporting Scope (94 sites)
i.e. including 2019 acquisitions)

We met our 2020 target in 2019 for a 6% GHG reduction from a GHG intensity of 0.590 in 2013.

We have revised our new GHG target to:

2025 Target:

10% reduction in combined GHG (Scope 1 and 2) intensity from 2019 levels

Our audited GHG Scope 1 and Scope 2 Emissions (both location-based and market-based)

Emissions Source	Amount (tCO ₂ e)
Scope 1	4,744,746
Scope 2 (Location Based)	2,344,695
Overall	7,089,441
Scope 2 (Market Based)	2,244,308

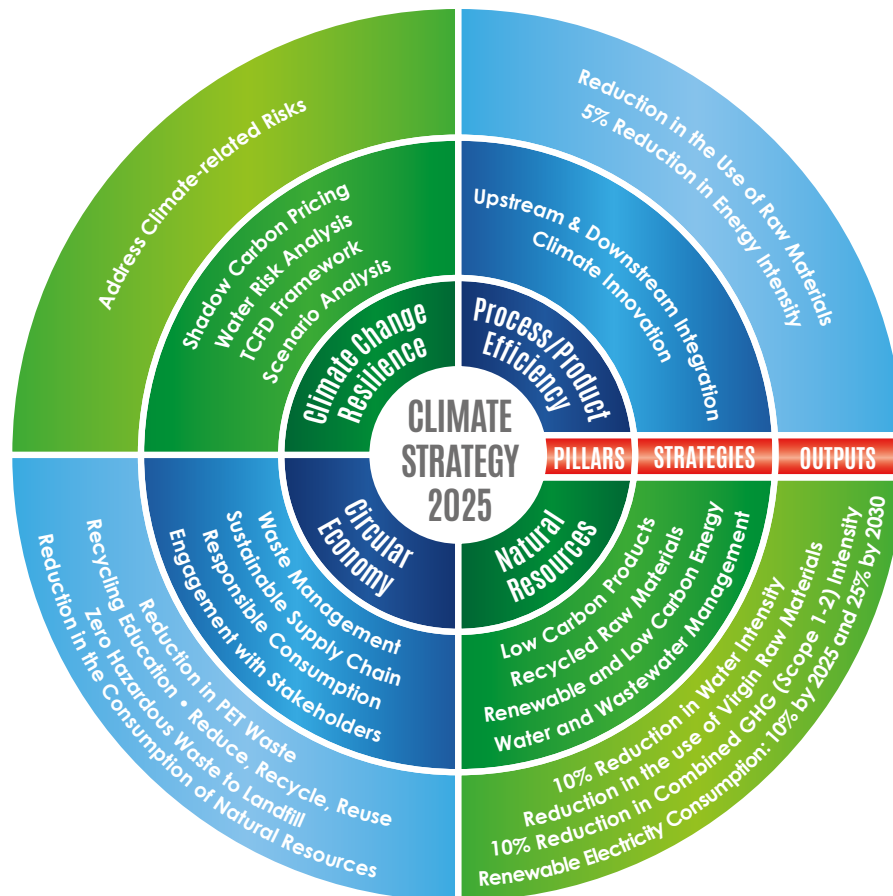
We monitor and evaluate financial and non-financial impacts as well as potential business risks of a regulated price on carbon and are taking further steps to study and implement a policy to embed the internal cost of carbon in our operations, including M&A decisions.

Climate 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°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.

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 to develop an effective low-carbon economy and to 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.



As climate change concerns become more intense on the global stage, IVL embraced the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) in our financial and non-financial evaluations. We relied on the IEA 450 scenario for financial analysis by using the internal shadow carbon price and the carbon tax imposed on countries which we have adopted as

a parameter to quantify monetary impacts, if the carbon tax were imposed in OECD and non-OECD countries. We conducted stress-testing analysis assuming USD 100 for OECD and USD 75 for non-OECD countries respectively for 2030 to anticipate the impacts on production, EBITDA, and revenue as part of our risk management process.

Implementation of the TCFD's Recommendations – Overview

The chemical sector supplies a broad range of products that serve a range of markets and industries. The sector is also 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 and across almost all other industries, and is a key enabler of the low-carbon economy.

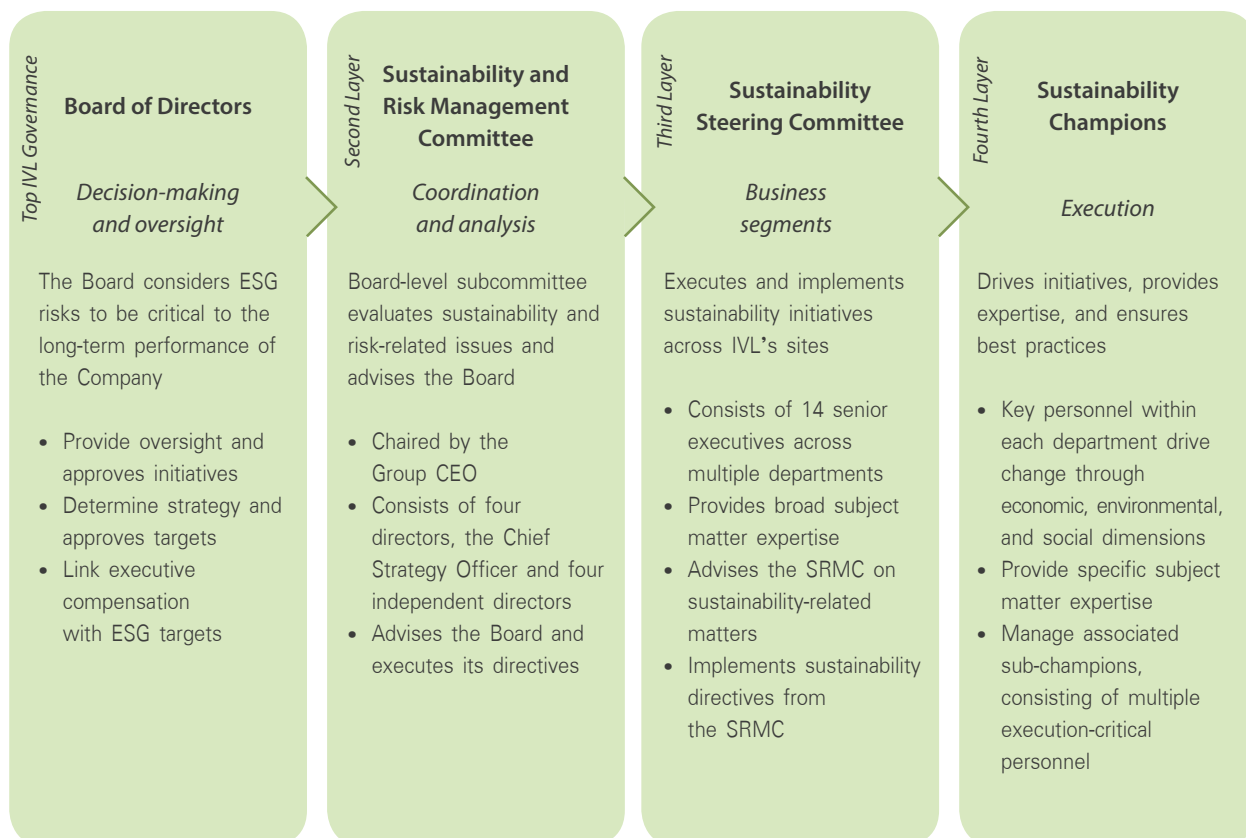
The TCFD's recommendations serve as a global foundation for effective climate-related disclosures. IVL's disclosures are in line with the TCFD's recommendations which enhance their consistency, robustness, and comparability. Our activities and contributions are detailed and clearly demonstrate how they support each of the four frameworks.



IVL has implemented the following core elements of recommended climate-related financial disclosures:

1. Governance

The Board of Directors oversees and reviews climate-related risks and opportunities, directly as well as through the Sustainability and Risk Management Committee (SRMC). The SRMC, one of three board sub-committees which meets semi-annually, works with a variety of departments including finance, risk, strategy, corporate governance and sustainability, in dealing with the broad and multidisciplinary nature of sustainability issues and concerns.



2. Strategy

Climate-Related Risks

Transition Risk	Technology	Market
	<p><i>Medium-term (3-10 years)</i></p> <ul style="list-style-type: none"> - 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 	<p><i>Medium-term (3-10 years)</i></p> <ul style="list-style-type: none"> - Changes in customer preferences from high carbon intensive to low carbon products - Increased cost of raw materials
Physical Risk	Policy and Legal	Reputation
	<p><i>Medium-term (3-10 years)</i></p> <ul style="list-style-type: none"> - 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 	<p><i>All timeframes</i></p> <ul style="list-style-type: none"> - Global focus on plastic pollution - Movements on fossil fuel avoidance - Change in consumer preferences - Increased stakeholder/investor concerns
Transition Risk	Acute	Chronic
	<p><i>Medium- and long-term (3+ years)</i></p> <ul style="list-style-type: none"> - Increased severity of extreme weather events such as cyclones, floods, and droughts 	<p><i>Medium- and long-term (3+ years)</i></p> <ul style="list-style-type: none"> - 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

Transition Risk	Technology	Market
	<p><i>Medium-term (3-10 years)</i></p> <ul style="list-style-type: none"> - Increased production of low carbon intensive products - Meeting changing consumer preferences - Meeting customer requirements 	<p><i>Medium-term (3-10 years)</i></p> <ul style="list-style-type: none"> - Development of new products - New markets
Physical Risk	Policy and Legal	Reputation
	<p><i>Medium-term (3-10 years)</i></p> <ul style="list-style-type: none"> - Technological improvements - Process innovations - Improving resource efficiency - Increasing recycling capacities - Emergence of new technologies, especially in the recycling business 	<p><i>All timeframes</i></p> <ul style="list-style-type: none"> - Opportunities from increased recycling - Opportunities from increased investments in renewable energy - Increased demand for low carbon products and products with recycled materials - Opportunities to attract investors with strong ESG performance
Transition Risk	Acute	Chronic
	<p><i>Medium- and long-term (3+ years)</i></p> <ul style="list-style-type: none"> - Utilizing advanced technologies - Improving efficiency - Zero liquid discharge - Production of low water and low carbon intensive products 	<p><i>Medium- and long-term (3+ years)</i></p> <ul style="list-style-type: none"> - Finding safe and suitable properties to set up new sites - Increasing water recycling capacity - Improving water efficiency

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.

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

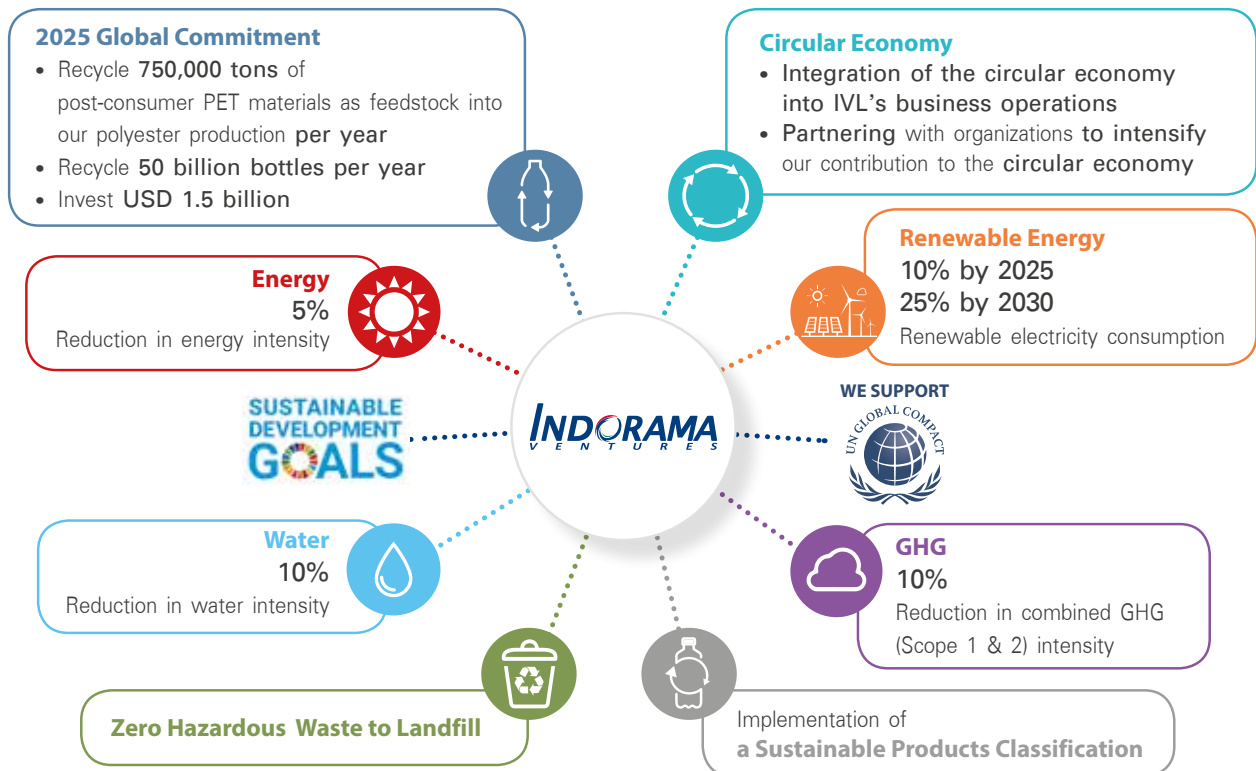
IVL is investing in numerous initiatives to achieve a more sustainable product portfolio. We are in the process of transitioning towards low carbon-intensive fuels, and aim to invest USD 1.5 billion in recycling systems by 2025. Furthermore, we aim to improve our ESG performance in order to attract additional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



Indorama Ventures Poland Sp. Z.O.O., Poland

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:



In addition, in line with the TCFD, we applied the AQUEDUCT Water Risk Atlas to forecast the change in future water stress and to identify sites that face the most significant risk in future water demand and supply. The results of these studies, which were presented under Water Management in this report, have been incorporated in our long-term adaptation measures which allows management to make informed and long-range decisions for IVL's sustainability.



For More Information

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 t CO_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.



Indorama Ventures Polimeros S.A. (IVPSA), Brazil

Water Management



We are committed to sustainable water management (including water withdrawal and discharge) through our Water Management Policy and Strategy, by complying with all applicable environmental laws, international standards, and regulations in the countries where we have operations, and by proactively demonstrating our leadership and responsibility in line with our values. Sustainably managing our water utilization is an important part of our day-to-day operations. We are committed to ensuring the most efficient water consumption by implementing the 3Rs (Reduce, Reuse, Recycle) as well as building wastewater treatment plants to recycle and reuse water, and to reduce freshwater withdrawal in most of our operations.

We achieved our 2019 water consumption target with a 4% reduction in water intensity, from 5.32 m³/ton of production in 2018 to 5.10 m³/ton of production in 2019.

Despite an increase in total water consumption, the total amount of water recycled and reused was 7.46% of total water consumption through a revised formula for the calculation in line with GRI guidelines.



Water Intensity:

2019 Target:

≤ 5.32 m³/ton of production

2019 Achievements:

2.44%

reduction in water intensity over 2018
(for 2018 Reporting Scope (72 sites)
i.e. excluding 2019 acquisitions)

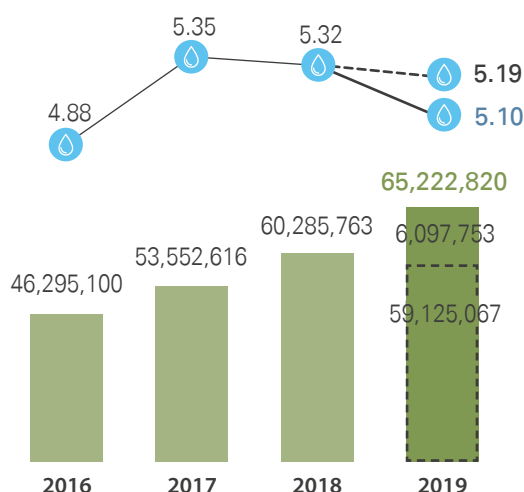
4.14%

reduction in water intensity over 2018
(for 2019 Reporting Scope (94 sites)
i.e. including 2019 acquisitions)

2025 Target:

10% reduction in water intensity
from 2019 levels

Total Water Withdrawal



Consumption (m³) - 2018 Reporting Scope (72 sites)

Consumption (m³) - 2019 Reporting Scope (94 sites)

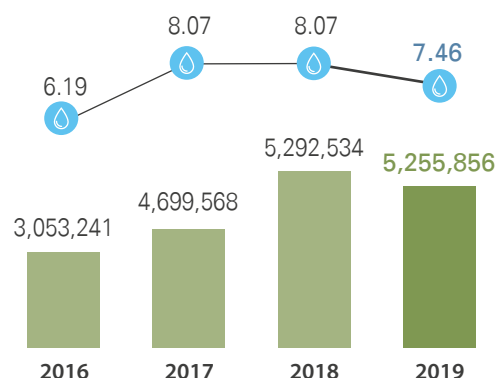
Intensity (m³/ton of production) - 2018 Reporting Scope (72 sites)

Intensity (m³/ton of production) - 2019 Reporting Scope (94 sites)

Note: Intensities are calculated based on overall production including inter-company sales.

Water Recycled/Reused*

* Percentage of historical recycled/reused water intensities are restated due to change in calculation methodology.



Total volume of recycled/reused water (m³)

Recycled/Reused water (%)



For More Information

Solution for a Large Volume of Wastewater and Excessive Disposal

For efficient and effective management of wastewater, Avgol (Russia), a subsidiary of the Company, installed a wastewater evaporator to reduce the volume of wastewater discharged thus lowering the load of wastewater treated after discharge, and in turn, reducing the treatment cost. The evaporator handles hydrophilic surfactant – 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 needed for a high boiling point condition and decrease the amount of water consumption as evaporated water can return to the process.



Water Risk

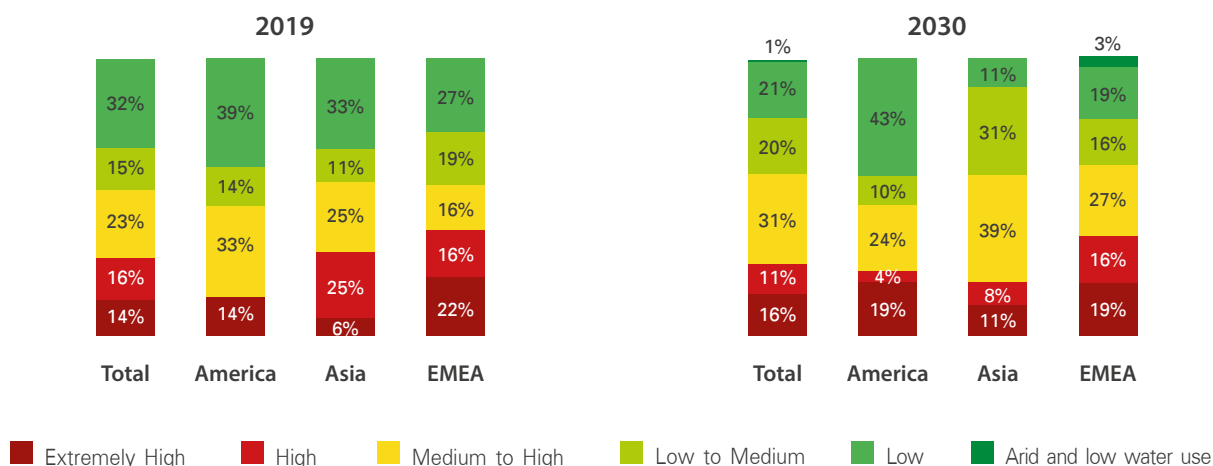
Conscious of water risk, IVL is demonstrating responsibility through our efficient water management and stewardship. We focus on local water risk assessments and through follow-up, have an effective risk management system in place, and regularly assess our exposure to water-related risks. We conducted 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.

In addition to the above, we also evaluated the financial impact on revenue, cost of goods sold, and EBITDA, among other components.

We also estimated the associated impact of water costs from this assessment in view of water scarcity. From the results and cost estimations, we communicate directly with plants to develop clear action plans and assign water champions to coordinate with all of the plants and regularly report to management. Further details are available in the Risk Factors section of our Annual Report 2019.



Summary of 2019 and 2030 Water Stress Assessment



% of IVL's operations identified in water stress areas using AQUEDUCT Water Risk Tool

Waste Management



We are committed to reducing our waste and increasing its disposal through sustainable vendors that reuse, recover or recycle, and are also committed to reducing our hazardous waste and ensuring that its disposal is handled by appropriate vendors. We manage our waste in a responsible manner and exceed regulatory requirements where possible in accordance with strict compliance standards in place to manage waste at our sites. We record the quantity of waste generated, stored onsite, and disposed of onsite and offsite, and are committed to waste reduction and disposal by using partners who can reuse, recover or recycle, thereby reducing hazardous waste and further ensuring that its disposal is handled by qualified vendors. In addition, we regularly carry out site audits of key vendors in order to ensure that the waste management standards of vendors are in line with our sustainable practices.

Our hazardous waste intensity reached 0.0058 tons/ton of production in 2019, increasing by 28.4% from 2018. We are working to further reduce both hazardous and non-hazardous waste and aim to minimize hazardous waste to landfill.

In 2019, the total amount of reused, recycled and recovered waste was 72% of total waste, increasing by 15% from 2018. This was the result of various new waste reduction, recycling and recovery initiatives implemented in 2019.



Total Hazardous Waste Intensity:

2019 Target:
 ≤ 0.0045 tons/ton of production

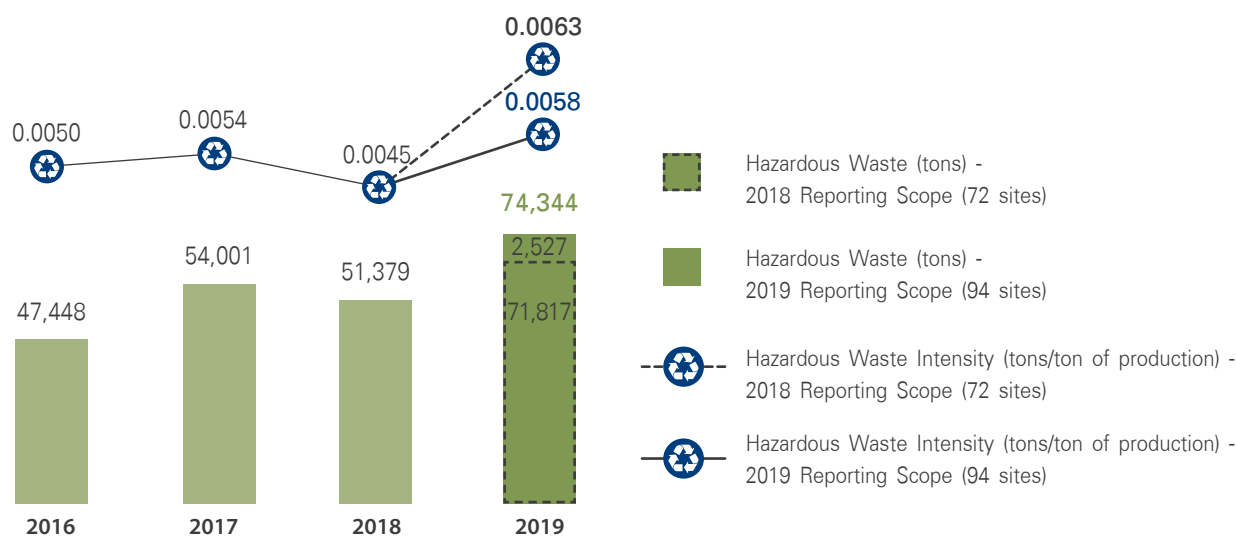
2019 Actual:
0.0063 tons/ton of production
 (for 2018 Reporting Scope (72 sites)
 i.e. excluding 2019 acquisitions)

0.0058 tons/ton of production
 (for 2019 Reporting Scope (94 sites)
 i.e. including 2019 acquisitions)



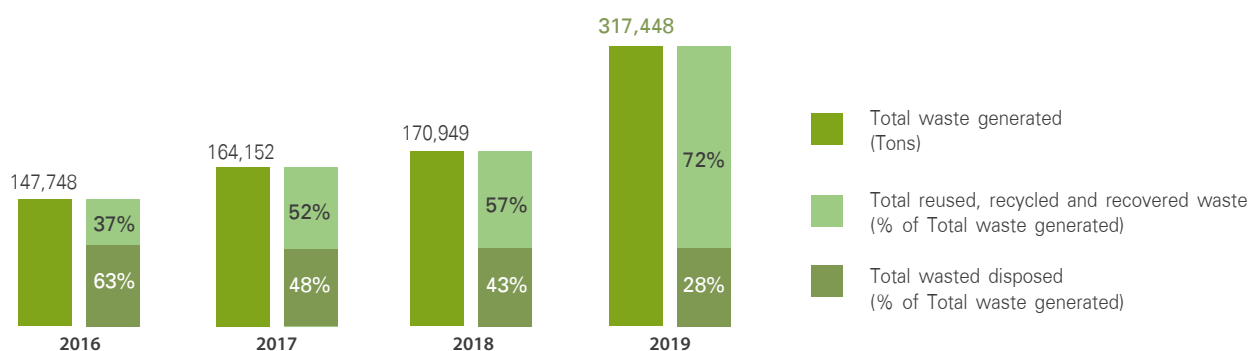
For More Information

Total Hazardous Waste



Note: Intensities are calculated based on overall production including inter-company sales.

Total Waste Generated, Disposed, Reused, Recycled and Recovered

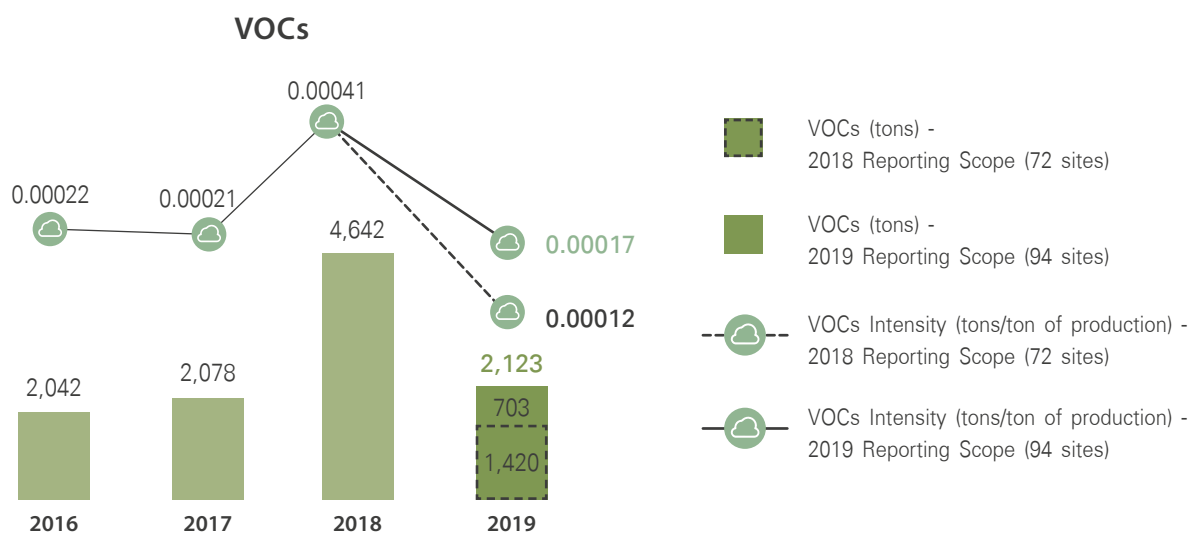
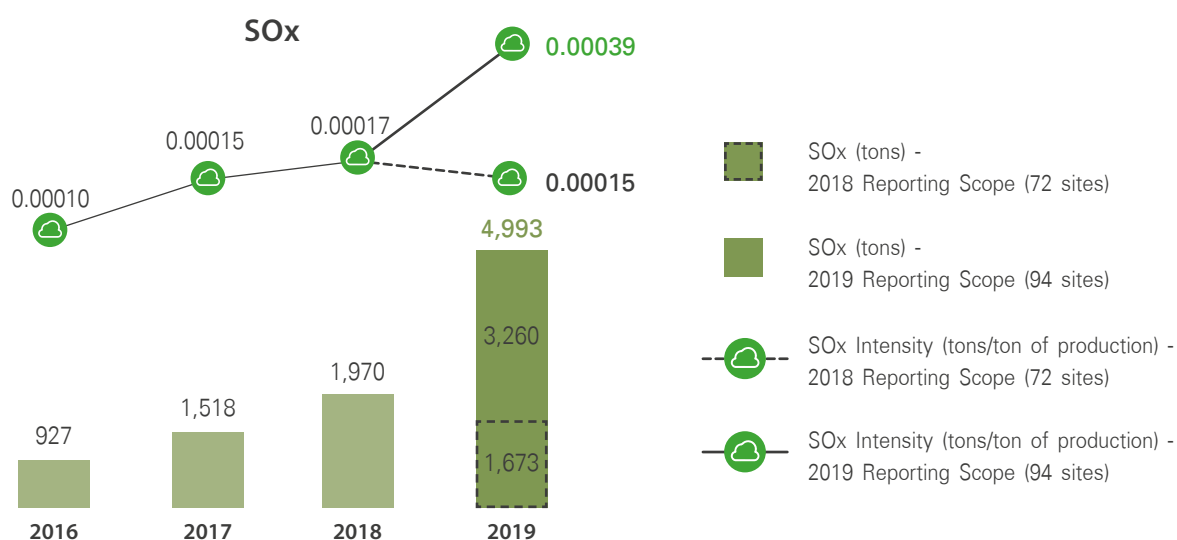
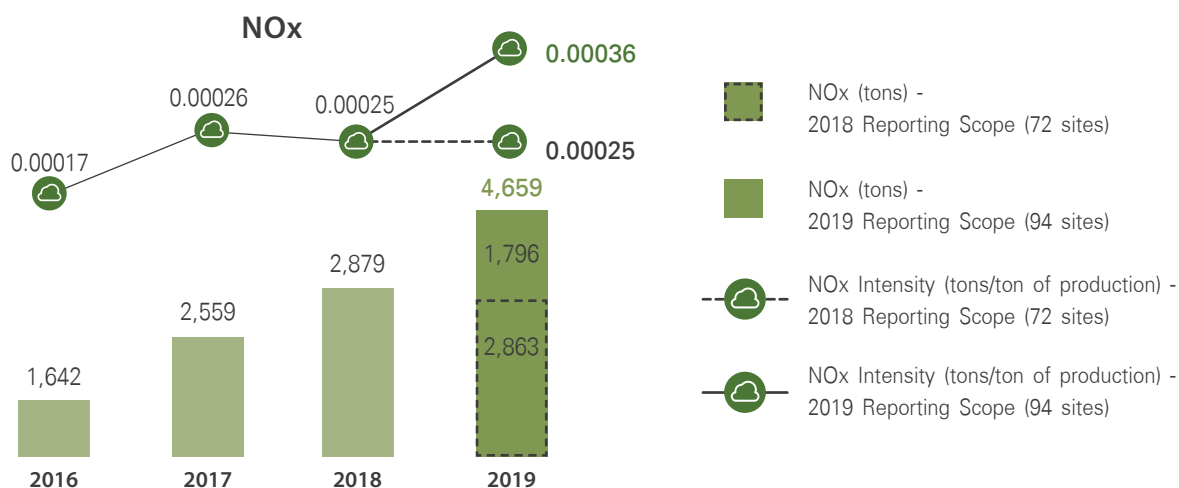


Indorama Ventures Europe B.V., Netherlands

Other Air Emissions

Air quality is an important priority for IVL. We monitor the following emissions from our activities and look for ways to improve our emissions standards, ensuring clean air for our employees as well as the communities surrounding our sites.

Our monitoring system involves periodic air sampling collected from monitoring stations. We are improving our calculation and sampling systems over time for more accurate data analysis and are seeing positive results.



Note: Intensities of NOx, SOx and VOCs were calculated based on overall production including inter-company sales.

Recycling PET – Trusted and Safe

Not all plastics are the same, and they are not all made the same way. Although there are seven types of plastics, Polyethylene Terephthalate, or PET, is one of the more unique materials offering a variety of advantages. It is versatile, lightweight, resilient, low-cost, has a longer shelf life and is 100% recyclable. PET is the most commonly used plastic with over 40% market share for water, beverage, and soda bottles. PET bottles are the most recycled of all plastics in the world. Most importantly, they have a significantly lower carbon footprint, compared to the alternatives, and with increased recycling rates, this can be further reduced substantially.

At Indorama Ventures, we believe that recycled PET (rPET) is a new engine for growth. We understand that there is considerable pressure on plastics and that many people around the world want a sustainable environment for future generations. Amid the challenges, there are also tremendous opportunities with PET, which is a 100% circular, recyclable plastic with a lower carbon footprint than other packaging materials such as glass and aluminum.

Our recycling strategy

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.

Our 2025 commitment and future strategy

The PET produced by IVL is 100% recyclable. As part of our recycling efforts, we have made a global commitment to recycle 750,000 tons of post-consumer PET materials as feedstock into our polyester production. We have also committed to investing USD 1.5 billion by 2025. This commitment is just the start of our journey, generating value from collected PET and promoting zero plastic in the environment.

Our recycling mission
To serve the recycling needs of IVL's customers by building a leading, differentiated, and economically attractive recycling business.

50 Billion Bottles Recycled

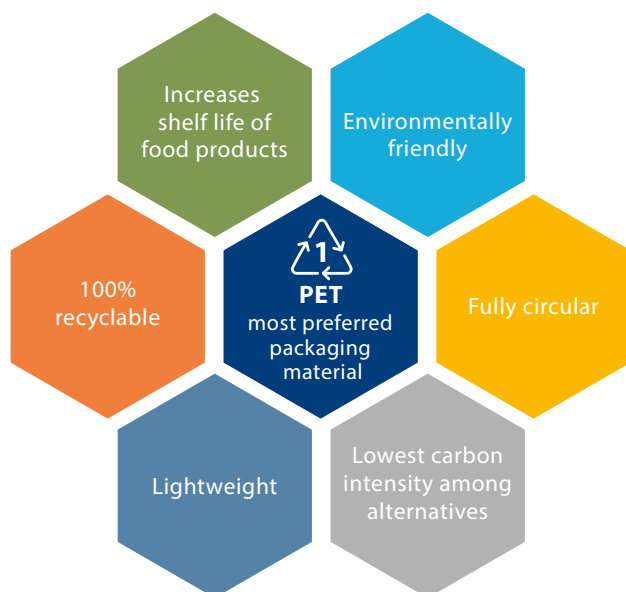
In the last decade, we recycled around 50 billion bottles and we aim to recycle much more. In 2019 alone, we recycled around over nine billion, or over 200,000 tons of post-consumer PET bottles.



On 23rd March, 2020 Indorama Ventures recycled our 50 billion PET bottles since 2011.

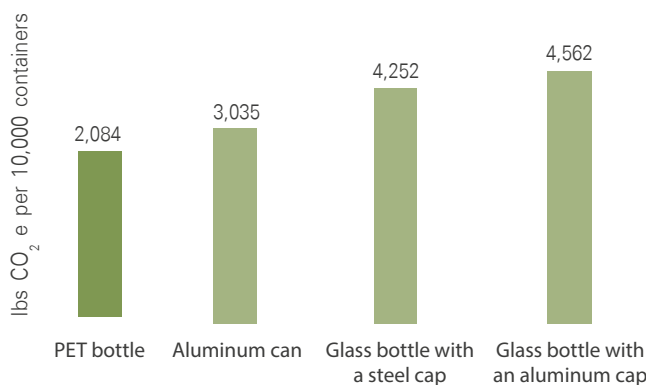
PET, a valuable resource

While PET has several economic, environmental, and social advantages, and is 100% recyclable, the mismanagement of PET after its use – leading to accumulation in landfills and oceans – is causing concerns globally.



While mismanagement of plastic resources has become a major emerging risk and ecological concern for the industry, it also presents significant opportunities, especially after China and several other countries took the bold step of banning imports of plastic waste in a move to protect their environments. The ban acted as a catalyst for companies around the world to change consumer behavior and gave rise to more effective recycling. Exporters are likely to be forced to expand their domestic recycling infrastructure as well as cut the levels of waste being produced. Furthermore, the lifecycle benefit of PET is well-established, and improved waste collection rates will mean an increase in recycling rates worldwide. PET, therefore, remains the standard in further promoting circular processing business models.

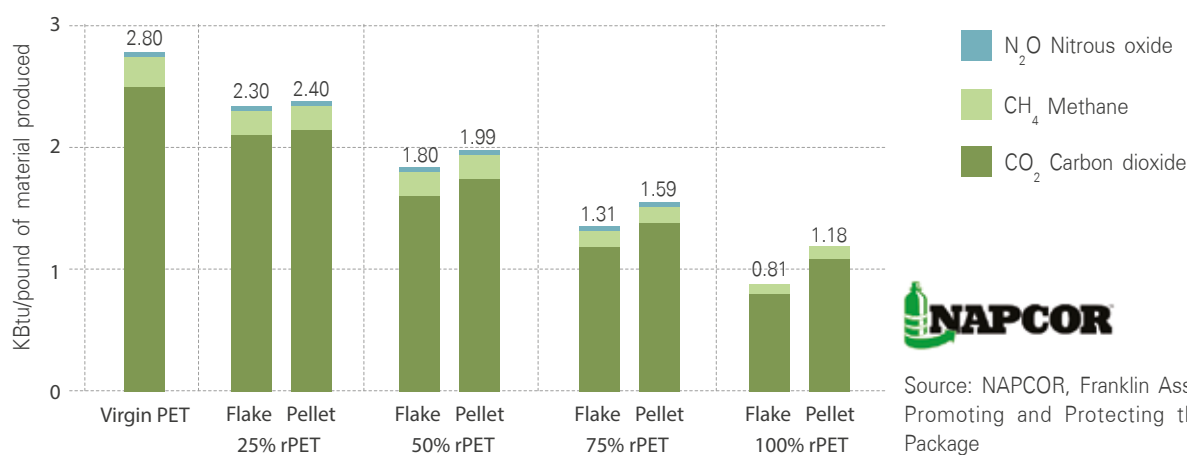
CO₂ Emissions (12 oz. container) based on 10,000 containers



Notes:

- Franklin Associates Assumptions (<http://www.petresin.org/pdf/FranklinLCISodaContainers2009.pdf>)
- Assumptions on recycling percentages of PET, AL & GL
 - PET bottles – 23.5% (2007 NAPCOR Report)
 - Aluminum – 45.1% (2007 EPA report)
 - Glass – 30.7% (2007 EPA report)

GHG Emissions: Varied %Virgin PET/rPET



Recycling for circularity and closing the loop

We are increasing our investments in recycling plants globally to close the loop, encouraging the end-use of recycled PET and delivering a circular economy for beverage packaging. IVL's global reach also provides the opportunity to demonstrate our leadership in innovations, bringing to market our own game-changing products, specialized solutions and High Value-Added (HVA) products. With a strong foundation in the PET market, we can tap into vast opportunities worldwide delivering the highest value to both existing and new customers, and creating long-term value for our stakeholders.

In 2011, our rPET resin production was roughly 3,576 tons, but by 2019, it had grown exponentially to about 206,996 tons. During this period, we recycled around 50 billion bottles. This worked out to 1.1 million tons of plastic waste not going to landfill, which would cover a span of 514 football fields, 1.65 million tons carbon footprint reduction, and a saving of more than three million barrels of crude oil.

Recycling education

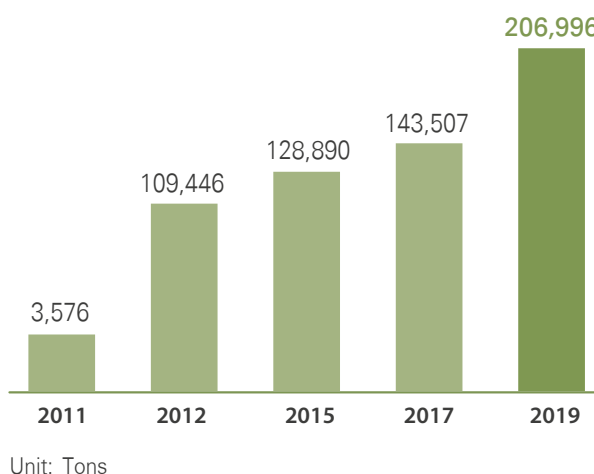
We encourage doing more with less through sustainable consumption and production in addition to educating consumers on the need to recycle and adopt a lifestyle focused on sustainability. Our global recycling education programs promote recycling and waste separation among children, communities, and consumers, and aim to increase their awareness and involvement in protecting the environment for a better future.

Recycling and the UN SDGs

We strongly support the global efforts underway to achieve the UN Sustainable Development Goals (SDGs). Our recycling efforts are particularly focused on addressing the following SDGs:



Post-Consumer PET Bottles Recycled



Collaborations with Industry Partners

We are working with several industry partners to achieve a circular economy for sustainable plastics, and intend to play a leading role by bringing customers of recycled products into the value chain and developing ways to include recyclability in all of our products. This is a major priority for us and is included in our climate change strategy.



Note: Please click on the logos to get further information on the recycling activities of the individual organizations.

In Thailand, we are closely collaborating with key customers, suppliers and industry associations, notably on efforts to persuade the government of Thailand to amend the current law banning the use of recycled PET in the production of new packaging for food and drinks. This process allows all parties to learn more about the need to recycle and to see the circular economy as an important approach to reducing waste.

With the many partnerships and initiatives underway, IVL remains singularly focused on doing better. PET is the ticket to creating “Zero Plastic Waste to Nature” due to its recyclability. With the need for compliance in accommodating post-consumer PET waste as a feedstock for the circular production of PET resin, IVL continues to play a leadership role in creating a better future.

Partnerships in innovative recycling technology

IVL is among 400 organizations that have committed to increasing the use of recycled plastic in packaging. We are accelerating our efforts in support of our very ambitious goal to increase our recycled content volumes by at least 750,000 tons.

We have acquired proprietary knowledge on mechanical recycling through our Wellman assets which we are scaling up. We have also developed partnerships with innovative players to develop and test next-generation chemical recycling technologies. For example, we collaborated with Ioniqa to create the first-ever PET bottle made from marine plastic waste.

rPET demand driven by brand owners

Many brands have set clear targets to increase rPET consumption in their beverage packaging. They likewise recognize the value of PET, not just from an economic point of view, but from a broader sustainability perspective. Therefore, PET, with the right collection and recycling infrastructure, will continue to be the market leader in beverage packaging. Progress in increasing rPET content has already been made to-date in commercial beverage products, demonstrating that brands have invested in making their rPET targets a reality. This presents a huge opportunity for us as many of these brands are major IVL customers.



For More Information

Product Stewardship

Managing the environmental impact of products is a major concern for stakeholders. Product Stewardship encourages innovation in our products and processes to meet increasing consumer, societal and business expectations on product sustainability and transparency. At the same time, we foresee a future where every product we innovate and bring to market is sustainable for the planet and society.

The integration of sustainable practices in the development of new products reflects an understanding of sustainability challenges and demonstrates our ability to capitalize on market opportunities and minimize market risk at the product level. Moreover, product stewardship processes add value to products by minimizing the risk of harm both to people and the environment, thereby reducing potential liabilities. We provide our product information to customers and always engage with them on initiatives to further promote product stewardship amongst stakeholders.

Our product eco-design criteria includes environmental impacts linked to the procurement of raw materials, product design, product manufacturing, product use and maintenance, take-back schemes as well as minimization of waste and hazardous materials by reusing and recycling, enabling the use of recycled feedstocks and support for our customers' initiatives in eco-impact per unit of use, for example, through weight reduction of the consumer product. Renewable raw materials and chemicals from bio-based content that we procure and use in our manufacturing needs to be certified (certifications must be provided) as originating from sustainable or environmentally friendly sources.

We have developed and are promoting a Sustainable Product Classification Methodology based on product safety and sustainability with various criteria including renewable resources, toxicity, energy sources, LCA and social factors. The sustainable product classification process is expected to be initiated in 2020 with a completed classification by 2021.

We ensure that our products present no risk to human health and the environment when used as intended, and generate value by identifying opportunities to reduce resource and material consumption, in addition to their eco-impact through Life Cycle Assessments (LCAs). We completed LCAs at all of our plants in Asia (excluding new acquisitions from 2017-2019) in accordance with ISO 14040/44:2006, with plans to extend LCAs to the rest of our operations.

Sustainable Pillow Made from Biopolymers PLA Feeling

The filling for the pillow consists of 95% biopolymer PLA made from sustainable raw materials offer a sustainable alternative to petroleum-based fibers, in addition to being recyclable and 100% biodegradable with industrial composting. This pillow has qualified for our Sinfineco brand, which is only awarded to sustainable Trevira products.



AEROPOWDER – biodegradable insulating material

This productive collaboration between Trevira and AEROPOWDER resulted in the creation of a completely biodegradable insulating material. A start-up based in London launched a new sustainable product called pluumo – a biodegradable, innovative packaging material that harnesses the power of feathers. Feathers have naturally insulating properties, and to find a fiber that would help realize their design idea, AEROPOWDER turned to Trevira GmbH. We developed special binding fibers – bicomponent fibers consisting of two different biopolymers.



PLA filament yarns obtained ISEGA certification

Trevira's PLA fibers can also help meet the needs of the food industry. Together with our customers, we have already obtained ISEGA certification for selected products. Trevira not only offers PLA staple fibers, but also PLA filament yarns. Some examples of products made from this sustainable material are knitted massage gloves by the Italian firm MDD di Maddaleno Massimiliano; an interior lining fabric that protects against the sun, by Spanish company Vertisol; and a woven 100% PLA fabric by French firm Chamatex.



From PET bottles to filament yarns

Filament yarns from recycled PET bottles are available at Trevira as raw white and spun-dyed flat and textured yarns in various colors and yarn counts. We have already been awarded Global Recycled Standard (GRS) certification for our recycled combed tops, which are deployed in polyester-wool mixes (55% PET/45% wool) for corporate wear and uniforms. We are working with our sister company, Schoeller GmbH & Co. KG, to develop cable types from recycled materials that can be used in the automotive industry, and we expect to obtain GRS certification for these products in the near future.



IVL wins two awards from Thaistar Packaging Award 2019

Indorama Polymers won two awards from the Department of Industrial Promotion's Thaistar Packaging Awards 2019 event at the Bangkok International Trade and Exhibition Center (BITEC).

- “Thaistar Packaging Award 2019” for Packaging Materials and Components
- “Best Sustainable Packaging Design Award 2019” a special recognition for “Ramapet HPC”, a high-quality PET material, which in 2018 won the “Eco Package Award” in this category as well



Product Safety

IVL is targeting zero violations of domestic and international regulations as well as zero use of any substance of very high concern (SVHC). We evaluate the chemicals used in our operations and their exposure to our employees and the environment, with effective controls in place of volatile substances on the SVHC list and the Substitute it Now (SIN) list that may present a risk.

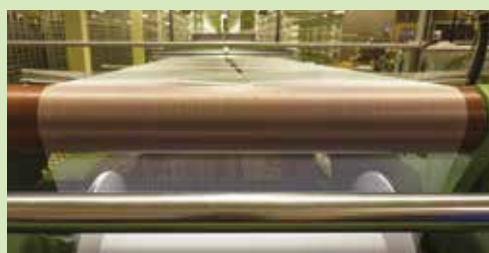
We comply with the European Chemicals Agency (ECHA)'s SVHC list and are proactively removing products on the SIN list. We monitor the release of SVHC updates and assess our raw material streams. In some cases, a substance could be on an SVHC list in raw form, but once it is converted to a different, benign form, it no longer has a product safety risk. The Product Compliance Risk Characterization (PCRC) process undertaken for 100% of our products is the mechanism by which this assessment is performed for their potential impact on human health and the environment. Specifically, the PCRC process gathers inputs from those interfacing with customers to obtain information about intended downstream applications. What follows is an assessment of each raw material with a focus on potentially new formulation components along with their effects on both manufacturing hazards and product compliance (in terms of both chemical registration and food safety) in target markets.

Highlights

- **100%** of European entities are compliant with REACH regulations
- **100%** compliance with the ECHA SVHC list and proactively removing products on the SIN list IVL is not listed as a manufacturer of chemicals on the SIN list

Antimony-free flame retardant staple fibers

An important functional fiber which we produce is Trevira CS[®], the world's premier flame-retardant fiber. Trevira has extended the antimony-free technology to these fibers.



In addition, we developed a Management of Hazardous and Chemicals/Substances Plan in which we are evaluating our portfolio for challenged chemicals/substances and setting an approach for substitution. Through this plan, we are committed to identifying products and setting targets for improvement by phasing out at risk hazardous chemicals. The substances may

not be directly regulated today, but as there is sufficient concern among stakeholders, IVL will be proactive in monitoring and seeking alternatives. Our goal is to complete the comprehensive assessment of our raw materials, chemicals, and products in 2020-2021 regarding the SIN list and to set a target for improvements in 2021-2022.

The result of our focus on Product Stewardship: iCare™ Heavy Metal-Free PET Fibers

As consumers demand increased safety standards, governments, consumer safety organizations, testing agencies and watchdog groups are expressing growing concerns over substances of interest (SOIs) that may be harmful to human health, particularly intimate hygiene products. Some of IVL's global customers challenged us to deliver antimony-free PET fibers. The request was simple: "The quality must remain consistent and the product specifications unchanged across multiple SKUs, with no disruption to our global supply chain". The CEO of IVL Fibers answered the call in keeping with our core values, "The Customer is why we exist", and seeing "Change as an opportunity". IVL's subsidiary, Trevira GmbH (Germany), had planned to launch antimony-free PET by January 2018. This set the stage to develop the capability at IVL's plant in Rayong, Thailand. Detailed capability reviews and trials were conducted, and after meticulous efforts over many months, quality antimony-free polyester was produced and received by staple fiber and filament plants, and downstream process parameters were adjusted to ensure that final products met specifications. This success was due to the incredible teamwork and passion of IVL's global team.

A new star has joined the IVL family: Heavy Metal-Free iCare™

iCare™ symbolizes the fifth core value of IVL: "We are responsible", demonstrating our industry leadership, sustainability, innovation, passion for excellence, eco-friendliness and a commitment to the success of our customers. Today, IVL has the capability of supplying a whole range of iCare™ fibers, filament yarns and PET resins for the apparel, home care, hygiene, automotive sectors, and industrial applications. iCare™ staple fibers include, but are not limited to, 100% PET fine and coarse deniers, hollow conjugated, and bicomponent fibers for various downstream products including clothing, disposable hygiene, pillows and bedding, toys, automotive nonwovens, and industrial nonwovens. iCare™ PET filament yarns include partially oriented yarns, draw textured yarns, fully oriented yarns, colored yarns and differential shrinkage yarns. IVL also offers iCare™ Heavy Metal Free Chips (resin) for filament yarns, spunbond/spunmelt and other products.



For More Information

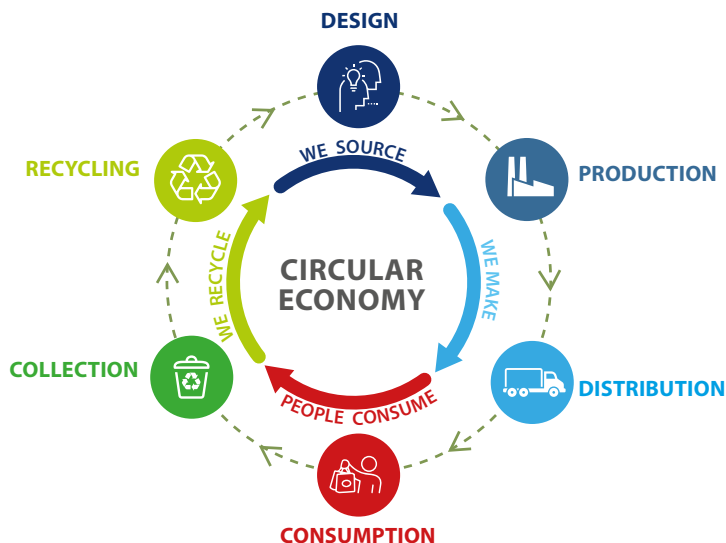
Circular Economy

Many integral parts of the jigsaw in an emerging circular economy, always strive to close the sustainability loop. IVL aims to use our combined power of innovation, industry, policy and people to ensure plastic we produce stay in the economy and is always seen as resource not waste.

IVL Recycling strategies enhances our capacity to drive closed loop solutions and move towards circular economy.



For More Information



DESIGN

Products are designed to be light weight, achieve high performance in the use phase, and include more sustainable and recycled materials which can be easily managed at their end of life.



Lightweight preform



Freshness and taste protection



Flame retardant polyester fibers



Nylon 6.6 tire cord



Upcycled textiles
Solid Textile Board/
Acoustic Textile Felt



Deja Brand – 100% Recycled PET



PRODUCTION

Operations that aim to reduce GHG emissions by using alternative raw materials and renewable energy as well as minimize resources consumption.



184,460 tCO₂e GHG emissions reduced through the use of renewable electricity and bio-based fuels.



- **33,968** tons of bio-based raw materials consumption
- **206,996** tons recycling of PCR bottles



- **100%** renewable electricity at four sites
- **5%** increase in renewable electricity consumption in 2019
- **416,916** MW of Renewable Energy including generation from Solar roof top plants



- **4%** water intensity reduction
- Water reused / recycled = **7.5%**



Total Waste recovery = **72%**



DISTRIBUTION

Improving Logistics Management / GHG Scope 3 Accounting

- Improving upstream and downstream transportation and distribution
- Shifting from road to rail transportation
- Moving to direct shipments by avoiding intermediary transshipments



CONSUMPTION

Advocating for Changes in Laws and Regulations by providing and promoting waste management and demand for rPET.



Collaboration to further encourage regulatory amendment that will allow the use of recycled PET in food and beverage packaging in Thailand.

Multi-year 100% rPET Supply Agreements

- Food and Beverages
- Global FMCG Brands



COLLECTION

Collaborating with Stakeholders to build Recycling Education Awareness (suppliers / partners / customers / general public / students / teachers / private sector)

890,310 bottles collected globally and 4,970 kgs of bottles were sent back to our recycling factory in Thailand.

Recycling Education Programs

IVL flagship program continues to be implemented at all of our operations globally.



MOU with GEPP - Partnering for Bottle Collection and Logistics



"Coke Collects" Project with Coca-Cola Thailand, 2,741 kgs PET bottles collected



MOU with Kasetsart University - Recyclable Waste Partnership



"Rak Pan Suk" project with Bangchak Corporation PCL. 600,000 bottles collected



RECYCLING

Recycling is the Heart of A Sustainable and Future Global Economy

Our 2025 global commitment

Towards Ellen McArthur Foundation as part of the New Plastic Economy



Collaborations with Industry Partners



Mechanical Recycling

We acquired proprietary knowledge on mechanical recycling in 2011 and scaled it up to 11 recycling facilities worldwide as of December 2019 with a total of 350,903 tons of PCR bottles recycled in 2019.

Chemical Recycling

Through our joint venture with Loop Industries, we will be able to perpetually recycle the ever-increasing amounts of PET plastic and polyester fiber.

We also have developed a partnership with Ionika to create the first-ever PET bottle made from marine plastic waste.



<https://www.coca-cola.eu/news/marine-bottle/>

SOCIAL



Occupational Health and Safety Management

The health and safety of staff is essential to the success and sustainability of our business. We place the health and safety of our workforce at the forefront of our activities and constantly implement programs for improvements. We believe that the ongoing health and safety of everyone involved in and impacted by our work, including our employees, contractors, communities and the public, is essential to our license to operate. We comply with our core values and even go beyond the provisions of the law. This enhances our appeal as an employer of choice, promotes employee satisfaction and productivity, and ensures that we continue to attract and retain a talented workforce.



2020 Target*:

Certification:

OHSAS 18001/ISO 45001

2020 Target:

98%

Status as of Dec 2019:

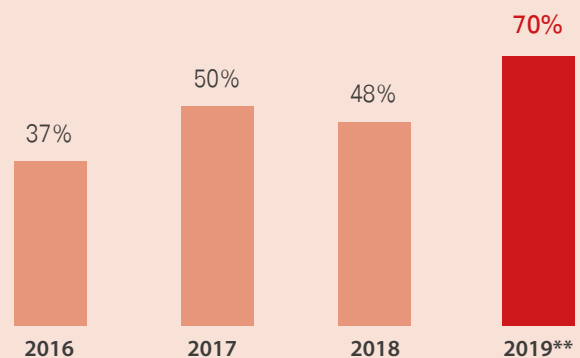
76%

* Applicable for the sites which are in IVL Group as of Dec 2018 (72 sites).

Management Approach

We continuously implement program improvements focused on the health, safety and well-being of our workforce. Our management approach involves going 'beyond compliance' with applicable legislation, regulations as well as government approvals and license conditions. We also have OHSAS 18001/ISO 45001 (Occupational Health and Safety Management System) certified at our plants. As of 31 December 2019, 70% of our operations across the globe were certified.

OHSAS 18001/ISO 45001 Certification Status



** Applicable for the sites which are in IVL Group as of 31 Dec 2019 (94 sites).



Health and Safety Management System, and Risk Assessments

The safety of our employees, contractors, communities, and protecting the environment are our top priorities and core values. We use our Health and Safety Policy and other occupational health and safety related documents to frame our safety approach and ensure that our employees implement health and safety practices for all site-based operations.

We also ensure that appropriate information, training courses and supervision are maintained including occupational health and safety training as part of the orientation process for staff, and that more detailed training workshops for project-related staff are provided for more in-depth operations. Providing training courses also helps to strengthen risk awareness among our employees and prevent work-related accidents.

In 2019, we continued to invest in occupational health and safety training for all our employees, who participated in over 465,000 hours of Health and Safety training. Beyond our employees, visitors also recognize that we strive to implement health and safety practices by developing a culture which supports good practices in addition to distributing health and safety materials to improve the focus on awareness and prevention.

Through our effective management approach, in 2019, there were no incidents of significant non-compliance with respect to regulations or voluntary codes concerning the health and safety of our operations as well as the impacts of our products.

Measures and Reporting

We have identified a number of measures which form the focus of data collection, reporting and analysis for both our corporate and business occupational health and safety.

Total Recordable Injury Rate (TRIR) and Lost Time Injury Frequency Rate (LTIFR)

In 2019, we recorded 1.45 cases per 200,000 man-hours and 4.18 cases per 1,000,000 man-hours for the TRIR and LTIFR respectively. The rate slightly increased over 2018 due to higher injury rates in our newly acquired plants, which are more labor intensive.

However, if we engage in a deeper analysis of the performance, we could reduce our TRIR and LTIFR by 8.5% and 1.6% respectively over 2018 within the same scope of the existing plants. We have set a goal of reducing the TRIR by 10% by 2025 from the 2019 level.

While our performance was dynamic, it is nevertheless important to thoroughly analyze every incident and their causes in detail at a global and business level to learn from the experience, take measures to reduce the injury rate and strive to minimize the potential impacts of incidents.



2025 Target:

10% reduction in
Total Recordable Injury Rate
from 2019 level

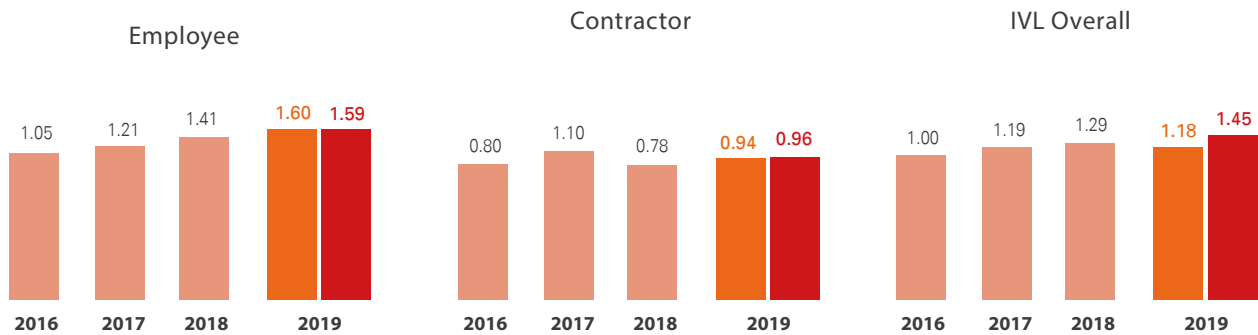


Indorama Petrochem (PET), Rayong, Thailand

Total Recordable Injury Rate: TRIR

(Cases/200,000 man-hours)

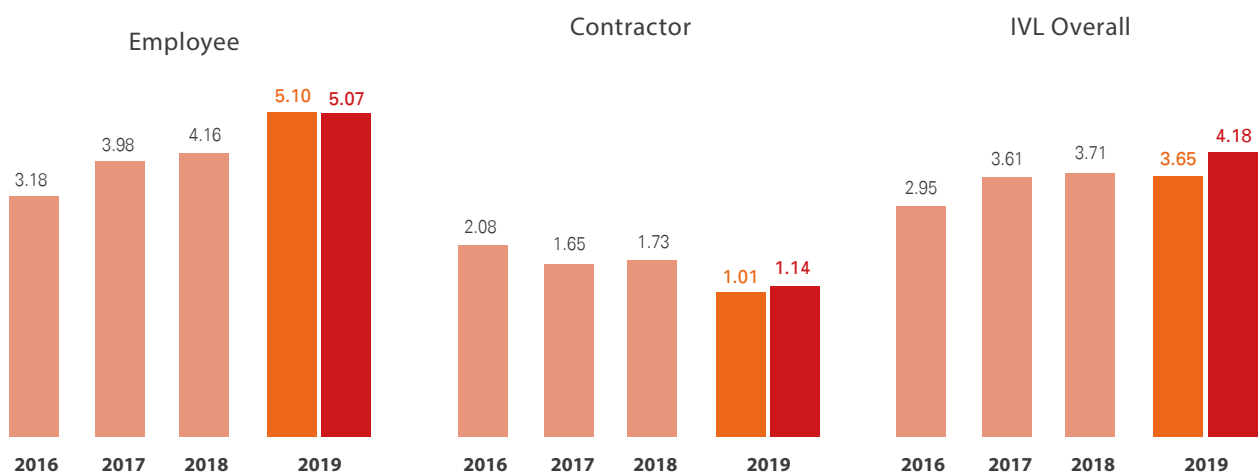
2018 Reporting Scope (72 sites)
2019 Reporting Scope (94 sites)



Lost Time Injury Frequency Rate: LTIFR

(Cases/1,000,000 man-hours)

2018 Reporting Scope (72 sites)
2019 Reporting Scope (94 sites)



Zero-accident: We strive to be an incident and injury-free company. A total of 35 (over 37%) of our sites attained the goal of “Zero-Accident” in 2019. We aim to have a higher number of sites in the future.

Near-miss: We reported 3,015 near-miss incidents in 2019, with the number rising significantly from 1,870 in 2018. Near-miss reporting is a useful tool for driving continuous safety improvements across the organization as it promotes a culture of safety in the workplace, and prevents and proactively reduces future accidents.

What went wrong:

Fatality: Unfortunately, there was one fatal work-related accident in 2019. A contractor of one of our plants in Thailand was electrocuted. We supported the relevant authorities in their investigation into the circumstances and cause of the accident. We undertook an in-depth investigation and used the findings to take appropriate measures to prevent this from happening again. Furthermore, the lessons learned, post-incident safety measures undertaken, including improving risk management practices, strengthening behavioral safety initiatives as well as the initiation of disciplinary action on those concerned, were communicated to all entities in the group.

Fire Accident: One of our facilities in Spain experienced a fire which was quickly brought under control. The working teams worked together effectively and rapidly took actions on incident handling and the recovery plan. Moreover, an injury root cause analysis was performed and mitigation plans were developed, while lessons learned from the incident were also shared across the group. Because the right incident and emergency response processes were in place and due to the prompt response from our teams, there were no injuries or shutdowns, and the business could continue seamlessly without any complications.

We continue to regularly monitor our occupational, health and safety, and overall approach so that we deliver a measurable and high standard of health and safety performance.

Process Safety

We are committed to ensuring the safety of our workforce, including process safety in our value chain, for more efficient operations. We ensure high safety standards in the design and construction of new plants, equipment, and the operations of all our plants around the world. We have rigorous process safety standards and Standard Operating Procedures (SOPs), some of which go beyond local legal requirements, to protect our employees and contractors. We assess all of the risks in our operations and ensure that appropriate safeguards are in place.

Process safety incidents can have a major impact on people and the environment. We continually improve our occupational health and safety performance by adapting OHSAS 18001/ISO 45001 standards and Process Safety Management (PSM) principles.

There were 24 Process Safety – Tier 1 cases in 2019. Our reporting coverage increased to 100% from 50% in 2018. Most incidents were related to the accidental release of material from containment, however, they were immediately restricted within IVL’s premises and there was no leakage into the environment.

Year	Process Safety – Tier 1	
	No. of Events	Rate (Cases/1,000,000 man-hours)
2016	0	0
2017	5	0.48
2018	8	0.43
2019	24	0.44

Year	Process Safety – Tier 2	
	No. of Events	Rate (Cases/1,000,000 man-hours)
2016	1	0.31
2017	3	0.29
2018	4	0.21
2019	14	0.26

Trevira Awarded “Systematic Safety” Seal of Approval

Trevira, our subsidiary in Germany, received the “Systematic Safety” seal of approval from the German Social Accident Insurance Institution for the Raw Materials and Chemical Industry (Berufsgenossenschaft Rohstoffe und chemische Industrie, BG RCI). The award confirms that Trevira GmbH meets the requirements for systematic and effective occupational health and safety management through the company’s occupational health and safety management system, which helps optimize production workflows and demonstrates the value that Trevira GmbH places on the health and safety of its employees. The “Systematic Safety” award, valid for three years, also certifies that Trevira fully meets the requirements of the ISO 45001:2018 industry standard.



Orion Global PET Recognized as a Health Promoting Company in 2018 by Lithuania’s Institute of Hygiene

Orion Global PET (OGP) received an appreciation certificate and award as a health promoting company in 2018 granted by the director of the Institute of Hygiene in Lithuania which was officially announced in 2019. Taking place at the Occupational Health Promotion in Lithuanian Enterprises Conference, OGP was recognized for focusing on improving the mental health and overall workplace climate for all of their employees.

Some qualifications of this award include providing optimal work related to physical and mental health conditions, adapting work to the abilities of each individual based on their physical and mental health status, and preventing occupational health hazards, among others. The selected companies successfully create healthy work environments and set an important example for other businesses.



Performance Fibers (Kaiping) continues to improve safety performance

Throughout 2019, all departments at Performance Fibers (Kaiping) implemented BBS activities to continually improve safety performance. All safety requirements were implemented in a timely and efficient manner with the aim of engaging every employee in the concept and requirements of “Safety First.”

Furthermore, Performance Fibers (Kaiping) successfully implemented two Industry 4.0 projects in 2019, auto doffing and packaging of spinning, and an auto loading cabler system. These two projects led the trend of Performance Fiber’s intelligent manufacturing, laid a solid foundation, and provided valuable experience for future fully automated production lines.

The ability to transport yarn pallets to the cabler and load the feeding creel automatically **greatly reduces labor intensity and the risk of injury**. This will reduce heavy physical work for around 11 operators, enabling the operations team to focus on production improvements leading to better production and safety performance.

This is the first successful case of a fully automatic solution for spinning in the tire fiber industry. After this system is implemented, all production tasks can be carried out by automated machine systems. **The auto loading cabler system is also the first successful case in the tire cord fabric industry, utilizing AGVs and robots.**

After undertaking several initiatives, including the above, Performance Fibers’ safety performance hit their best record in 10 years (2009-2019). At the same time, Performance Fibers (Kaiping) also successfully passed the ISO 45001 and ISO 14001 certifications in October 2019.



Wellness Workplace

We care about our employees and make every effort to create a healthy work-life balance without compromising productivity or efficiency. We are proud that 91.43% of our employees are covered by joint management worker health and safety management committees at our plants. Promotion of good health, safety and wellness is addressed through the committees.

We also encourage employees to stay fit, and promote stress management in the workplace for the improved health and well-being of our employees globally. Some of our other programs include access to fitness centers, participation in charity fitness challenges, company outings, community engagement opportunities, and team-building exercises involving badminton, basketball, yoga, cycling and running clubs. IVL supports a safe and healthy work environment, including ergonomic workplaces, ventilated offices that provide acceptable indoor air quality, and noise mitigation in our plants and manufacturing facilities. Stress management is another

area of concern as stress is sometimes not acknowledged by the affected employee and can have negative impacts on their health, well-being and employability. In response, local wellness initiatives are on increasing to help employees make smart and healthy choices. This addresses our responsibility to our employees and helps in developing a vibrant workforce that is best able to support our goals.

Highlights

- **91.43%** of our employees are represented in formal joint management-worker health and safety committees
- **61.47%** of our employees covered by collective bargain agreements



For More Information



Indorama Ventures Química S.L.U., Spain

Supplier Human Rights Assessment



Committed to protecting human rights

At IVL, we strongly believe in the rights and dignity of people. Slavery and human trafficking in any form are prohibited throughout our Group and supply chain.

We believe in having an inclusive environment and a diverse workforce. Diversity is not only one of our core values, it is also a hugely important asset. As a global company, we value the variety of knowledge, perspectives and experiences throughout our organization, and draw strength from our worldwide team to fuel our competitiveness.

Aloke Lohia

The supplier assessment is essential to ensure social compliance, labor standards including human rights, labor safety, a workforce free of child labor and discrimination in the supply chain, as well as environmental compliance by suppliers within the supply chain. Our supply chain is global, and to not be complicit in human rights abuses, we must know where the risks are and how to mitigate them. For this reason, we strongly believe that it is important to fulfill our responsibility to respect human rights while taking into consideration the range of our impacts. Accordingly, the Human Rights Policy and Supplier Code of Conduct should be followed both within and outside of the Company. Adherence to the Policy and Code of Conduct, and compliance with social standards elevates our competitive advantage and also strengthens the trust of internal and external stakeholders, especially our customers.

Compliance is an ongoing process and standards are updated regularly. IVL continuously evaluates and manages risks across end-to-end supply chains to

develop and implement an effective business risk strategy based on the UN Global Compact and on ILO and ISO standards in areas relating to human rights, labor conditions, environmental responsibility and systematic environmental work, anti-corruption and, finally, the way in which a company's own sustainability work is followed up and evaluated. The risk management committees of our respective businesses review supply chain risks on a quarterly basis and appropriate risk mitigation actions are initiated as needed.

Our Commitment

In line with our Human Rights Policy, we are committed to promoting human rights throughout our entire value chain. We require our suppliers to comply with all applicable laws and regulations, to ensure health and safety in the workplace and to deploy appropriate labor and hiring practices. IVL is further committed to complying with environmental standards and has included ESG compliance clauses in legally binding agreements with key suppliers.



Actions Taken

In addition to their operations, the supplier is also responsible for ensuring compliance of any subcontractor(s) as if it were the supplier itself. IVL expects that its suppliers will establish and maintain appropriate management systems related to the content of our Supplier Code of Conduct. Across IVL Group, a global procurement directive is in place which establishes, as binding, the Human Rights Policy and Supplier Code of Conduct to safeguard human rights in our supplier selection process. Such requirements include, among others:

- Establishing and maintaining an appropriate management system related to the content of the Human Rights Policy and Supplier Code of Conduct
- Actively reviewing and monitoring their management processes and business operations to ensure they align with the principles set forth in the Human Rights Policy and Supplier Code of Conduct
- Reviewing the progress of suppliers and subcontractors in implementing the Human Rights Policy and Supplier Code of Conduct

IVL may take various supportive initiatives, including a request that suppliers self-certify that they are in compliance with the Code, and in some cases, conducting onsite evaluations and sections of supplier facilities, and those of their sub-contractors. If an audit identifies any non-compliance of the Code and Policy, suppliers must act promptly to remedy the situation to the Company's satisfaction. Failure to do so may impact the future ability of a supplier to do business with IVL.

Methodology and Results

The human rights assessment is part of the ESG evaluation of our Supplier Evaluation Process, which was initiated in 2014, extended to 100% of raw material suppliers and critical non-raw material suppliers in 2015, and has continued up until now. This process applies to all new raw material and critical non-raw material suppliers, requesting that they respond to a self-assessment questionnaire that will assist in assessing opportunities and risks relating to human rights, child and forced labor, governance (regulatory compliance) and improving a sustainable supply chain. Child labor, forced or compulsory labor, and a human rights grievance mechanism have been established as the main action items that IVL will address first, taking into account the level of impact of business activities and the level of social interest.

The assessment results in 2019:

- 100% of raw material suppliers and critical non-raw material suppliers were assessed based on human rights related risks
- No key raw materials and critical non-raw materials suppliers were identified as human rights related risks
- No key raw materials and critical non-raw materials suppliers were specified of being exposed to risks of incidents of child, forced and compulsory labor
- No complaints concerning human rights were submitted through the grievance reporting system



For More Information



Workplace Human Rights Assessment

The United Nations Global Compact, a policy platform and a practical framework for companies that are committed to sustainability and responsible business practices, remains the guiding force for IVL's Workplace Human Rights Assessment (WHRA) framework. Our WHRA framework includes four different levels: corporate, country, site, and product. It covers the following stakeholders for our operations, including joint ventures:

- a. Own employees
- b. Children
- c. Indigenous people
- d. Migrant labor
- e. Third-party contracted labor
- f. Local communities

The WHRA framework embodies a three-stage assessment process called IACM – Identify; Assess; Communicate and Mitigate. The Online WHRA survey tool which IVL started using in 2016 continues to play pivotal role in this assessment process. In 2019, the survey was conducted for IVL's work locations across 33 countries. It also encompasses five vulnerable groups within IVL's operations, including joint ventures. These groups are: national minorities; disabled persons; senior citizens; people with HIV; and the LGBT community. The range of questions was extended by incorporating one new risk indicator, environmentally friendly technologies, to make the survey more relevant with emerging trends. This indicator was identified by analyzing feedback and roundtable discussions received from communities and business partners.

1 Corporate Level

The corporate level identifies emerging trends in human rights and initiates risk mitigating actions

2 Country Level

A country initiates specific actions based on the Human Rights Risk Assessment

3 Site Level

Site/business units initiate specific actions based on the Human Rights Risk Assessment

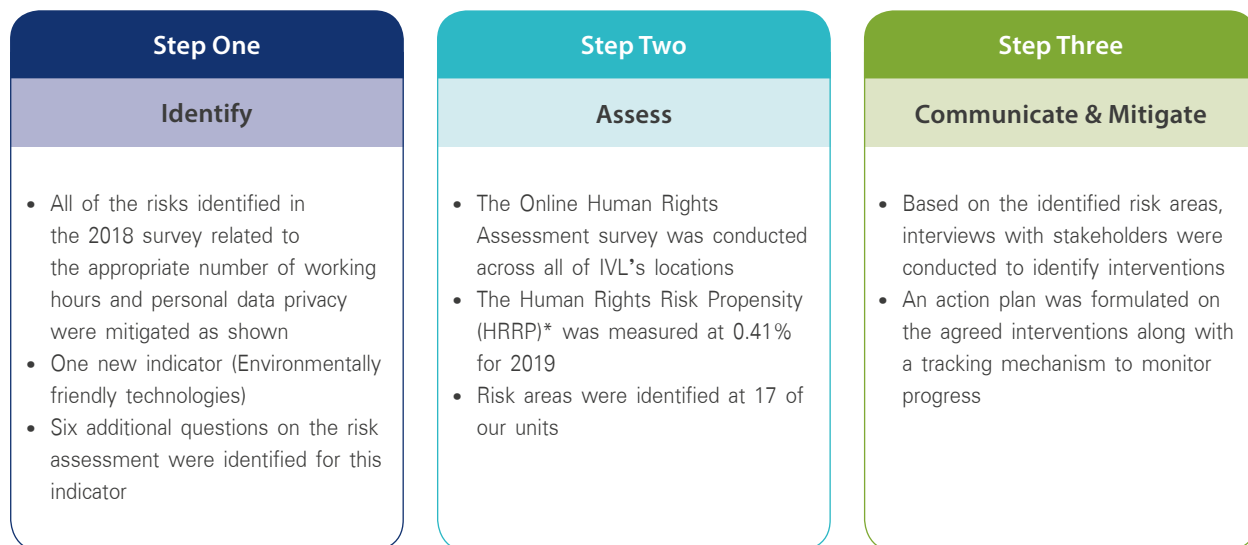
4 Product Level

Product specific risks are to be mitigated in consultation with manufacturing heads



Indorama Ventures Corlu PET Sanayi A.Ş., Turkey

The outcome of the assessment process for 2019 is as follows:



*HRRP = The number of potential human rights risks identified/(Responses from total units * total questions)

The following areas of improvement and remedial actions were identified:

Areas of Improvement		Remedial Actions	
		Corporate Level	Country/Site Level
Safe, suitable and sanitary work facilities	Intensive protection for safe, suitable and sanitary workplaces and facilities during the COVID-19 outbreak	<ul style="list-style-type: none"> Consult with the International SOS organization Set up the Global Emergency Management (GEM) team 	<ul style="list-style-type: none"> Align with corporate practices on legal, communications, and human resource management based on the specific context at own country/site
Employment-related decisions based on relevant and objective criteria	Ensure that decisions concerning hiring, compensation & benefits, promotions, training, discipline, retirement and termination are based on appropriate principles	<ul style="list-style-type: none"> Continuous improvement of Global HR standard practices and processes with an integrated HR structure 	<ul style="list-style-type: none"> Provide support and feedback for improvements to Global HR and implement at own country/site

Major areas for improvement:

No major risks were observed for the five vulnerable groups.

We will continue with our three-stage assessment approach to ensure that the assessment needs are evaluated on a continuous basis with IVL's unique risk profile and operating context.



For More Information

Unlocking Human Capital

IVL's sustainable human capital strategy focuses on Leadership Development, and investing in and developing the best management team in the industry. The quality of leaders in an organization, with ambitions to achieve superior and sustainable performance, is crucial.

In 2019, Leadership Development was our highest human resource priority and this will continue going forward. We launched several activities to support our leadership development process, starting with the alignment of the Performance Management Process which applies to the top 50+ roles in the group. The Group CEO's objectives have been aligned with the company's vision and strategic business priorities. These objectives are implemented by those reporting directly to the GCEO and by the support levels below in a coordinated process, resulting in structured and well-aligned coverage of all the important business processes, with positive short and long-term impacts.

Our journey to unlock our human capital for sustainable long-term results also depends on ensuring that a new generation of leaders is ready to take an active role in directing the Company's continued growth and evolution.

With this in mind, in 2019, we introduced the Group Succession Planning Process, initially targeting the top 50+ in the group, resulting in a defined pool of successors and dedicated development plans already in place.

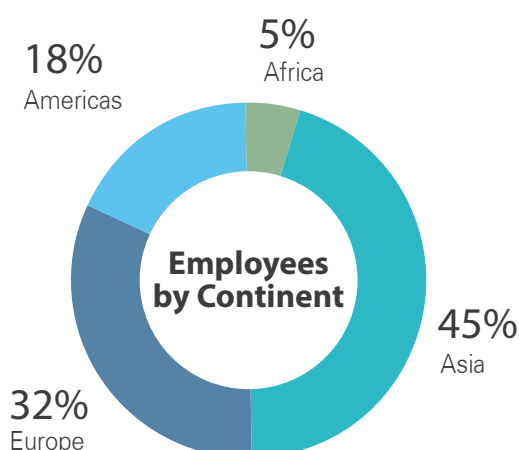
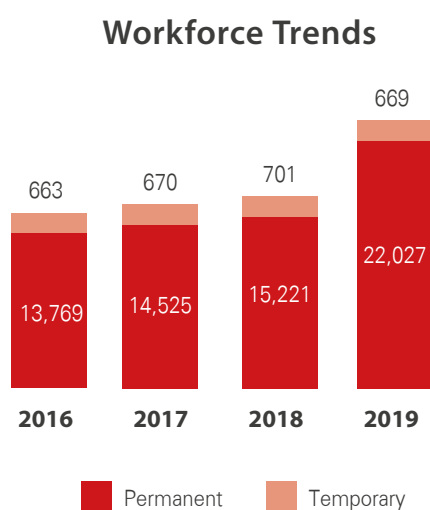
Last year, we also introduced the IVL Group Leadership Curriculum, and in 2020, all of the initiatives of the Leadership Curriculum will be implemented, following a plan that over time will include all of IVL's leaders in all geographies and organizational levels.

IVL's vision of unlocking our human capital is related to our ongoing HR journey which is following a roadmap detailing our priorities over the next three years and touching on all of the fundamentals of people management: Leadership and People Development, Talent Management, Talent Acquisition, Total Rewards, Performance Management, Employee Engagement, HR Tools & Digitalization, and HR Function Capabilities.

We are also committed to sustainably building IVL Group's growth culture where employees are engaged, inquisitive, inclusive, and become ambassadors of a great place to work.

Global Workforce

Our global workforce of 22,696 employees includes 669 temporary staff, with some relevant highlights below:



IVL's acquisitions in the Asia-Pacific, Europe and the US contributed to 95.68% of our employee growth in 2019. It is therefore important to maintain an effective HR strategy which ensures that the Company is better able to respond to the needs of a rapidly changing marketplace and business.

Diverse and Inclusive Workforce

At IVL, diversity goes beyond culture, language, gender, age, or nationality. It also includes different approaches and ways of thinking. We value our diverse and inclusive workforce and see it as an important competitive advantage. Our diversity and inclusion efforts begin with the recruitment of candidates, and continues through career management, learning and development, and promotions and rewards for all employees. We offer careers suited to the skills and experiences of employees so they can add value to the Company and contribute to our long-term success. Some of our diversity indicators are as follows:

Gender Diversity



22%

Women

Nationalities



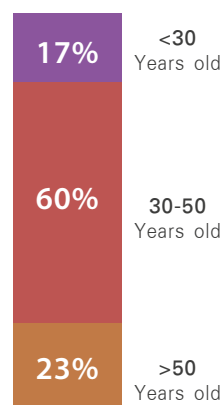
79

Employees with Disabilities



198

Age Diversity



To reinforce our belief that inclusion is the foundation of a sustainable and strong culture, our diversity policy is communicated to employees across all of IVL's locations. Diversity practices are further reinforced across employee life cycle processes.



For More Information

Talent Attraction and Retention

Staffing needs resulting from retirement, attrition and future strategic needs are well-embedded with our talent attraction, retention and succession planning programs. In 2019, IVL welcomed 2,042 new employees of whom, 28.2% were women.

Continent	Male		Female		Total	
	Number	%	Number	%	Number	%
Asia	571	28.0%	264	12.9%	835	40.9%
Europe	334	16.4%	165	8.1%	499	24.4%
The Americas	410	20.1%	146	7.1%	556	27.2%
Africa	149	7.3%	3	0.1%	152	7.5%
Total	1,464	71.8%	578	28.2%	2,042	100.0%

While our global and regional employee referral program is pivotal in attracting talent, we also use other platforms such as Campus Connect and LinkedIn to further reach potential candidates.

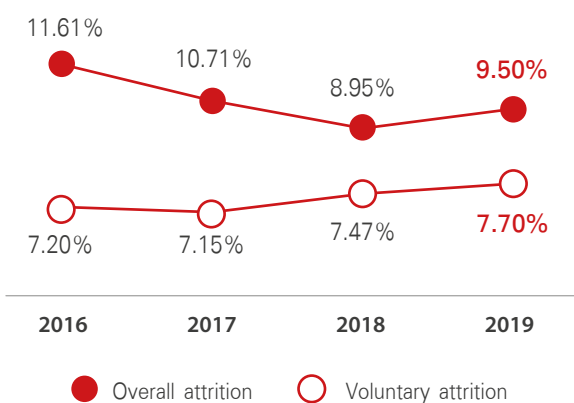
We are complying with local minimum wages and the ratios of standard entry level wage compared to local minimum wage of both male and female employee is greater than one.



For More Information

Retention Rate Over 90%

We calibrate employee lifecycle processes through insights gathered from labor market scenarios, strategy meet sessions, the Global Employee Engagement survey, and focus group discussions. This calibration is underpinned by data analytics to identify the best options for talent retention.



Note: Turnover rates have been recalculated and restated using a more stringent definition and methodology.

Beginning in 2018, we have increasingly relied on data analytics, which is one of the best approaches to identifying hot-spots requiring a response. Retention interventions were crafted by understanding a Business Unit's specific needs, with appropriate action taken at the country, regional or global level.

To better understand and analyze our data, we implemented a new methodology with a change of concept that expands the focus area by covering all of the group's employees including newly acquired units and additional voluntary reasons as well.

With a shift of 0.55%, our overall attrition rate for 2019 was 9.50%. This is a result of our rapid growth due to the large number of acquisitions in 2019 resulting in the integration of more than 22,000 employees across the globe.

We believe that a firm foundation will lead to sustainable and positive changes. We have begun to deliver a global platform in many HR-related areas that are aligned with our strategic long-term HR priorities as follows:

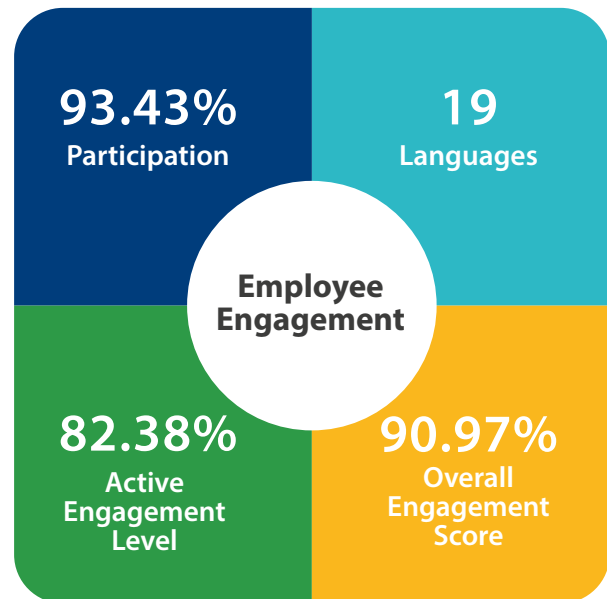
- **SAP HR:** Began a detailed feasibility study in 2019 together with a project to configure our systems, ensuring they are aligned with the new HR global processes in 2020 and to prepare and implement an effective and efficient global HR platform covering the key HR processes.
- **Talent Acquisition and Management:** Began a detailed feasibility study and initiated a project to deploy Succession Planning scoping from the top level down to N-3 levels in 2020.
- **Global Employee Engagement:** We decided to move the yearly GEE process to every second year to ensure a deeper review of the feedback given by employees, and improved implementation of the initiatives as per the feedback from the engagement process before we further approach our employees for the survey. We plan to rollout a new and more efficient GEE program in 2021 which promotes diversity, delegation, trust, and inclusive management.
- **HR Function Capabilities and Engagement:** To strengthen merger & acquisitions; skills and benefits; and engage all HR managers in projects, process design and policy setting.



UAB Orion Global PET, Lithuania

Workforce Engagement

The Global Employee Engagement (GEE) survey is proving to be an effective tool in listening to every single employee and understanding what matters most to them. In 2019, we decided to move the annual GEE process to every second year with the next one set to take place in 2021. The GEE survey results from 2018, which we continue to use, was made available in 19 languages with the participation of 93.43% of permanent employees. The 90.97% overall engagement score (equivalent to 3.85 out of 5) shows that we are on track to exploring and establishing ways to engage our workforce in a more meaningful way.



Operational Excellence Awards

The Award is a significant initiative at IVL to sustain and improve employee engagement, and is meant to inspire our employees to challenge all boundaries and produce outstanding results. Underway since 2017, this award is based on stellar performance across 10 criteria based on: Financial Performance, Operational Performance, and Sustainability Performance (environment, health and safety). The best Business Units are identified by benchmarking their performance across these criteria, and are awarded at the annual Global Management Conference (GMC).



Feedstock Business

Indorama Ventures Portugal PTA, Portugal



Fibers Business

Indorama Polyester Industries Public Company Limited (Nakhon Pathom), Thailand



PET Business

AsiaPet (Thailand) Limited, Thailand



Packaging Business

Petform (Thailand) Limited, Lopburi, Thailand

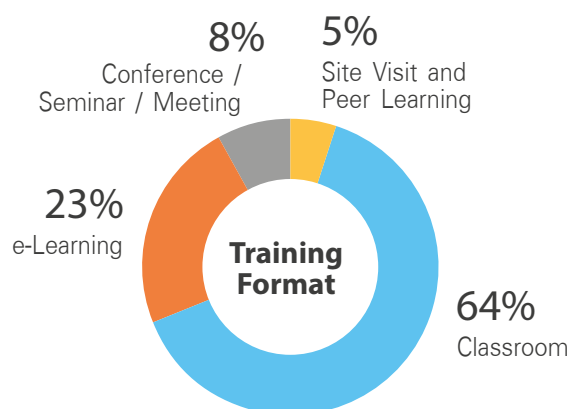
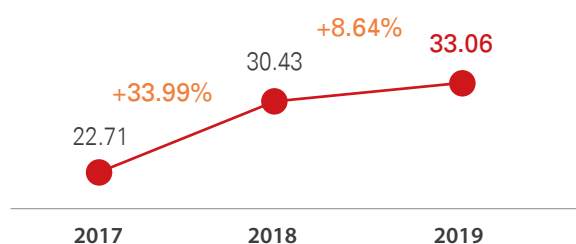


People Development

We continued to invest in our people at all levels by providing access to a modern workplace, development opportunities and an inspirational culture. In 2019, we invested an average of USD 170.67 per employee in people development. Our average training hours per employee increased in 2019 to 33.06 hours compared to 30.43 hours in 2018 for a total of 728,206 training hours.

All of the programs are designed to ensure that our employees are fully supported, empowered in their day-to-day work, and suitably equipped for future challenges.

Number of Training Hours Per Employee



Ongoing Developments

The V-Lead Fibers Business program has been implemented since 2018 to strengthen our functional knowledge and skills in the Fibers Business segment along with our Shadow Development initiative which supports a pipeline of qualified and talented experts to become part of a dedicated team at IVL. In addition, our Lean Six Sigma (LSS) program is essential in helping to promote operational excellence in our manufacturing.

Development Programs	Program Objectives/Led By	Development Program Outcomes
1. V-Lead Fibers Business	<ul style="list-style-type: none"> Develop a leadership pipeline in the respective business Led by the Business Head 	27 management personnel participate in this nine-month blended-learning approach designed to develop cross-functional expertise
2. Shadow Development	<ul style="list-style-type: none"> Develop local talent who can replace senior leadership Led by local HR 	18 high potential middle management personnel participate in this unique co-developed program between IVL and the prestigious Sasin School of Management in Thailand, to prepare local talented.
3. Lean Six Sigma (LSS) Program	<ul style="list-style-type: none"> Streamline processes which result in efficient services and quality products at optimum costs Led by a global operational excellence champion 	<p>In 2019, 1,880 employees attended LSS programs and undertook over 300 projects. From 2012 to 2019, over 62,896 Six Sigma training hours resulted in over USD 41 million in savings for the Company.</p> <p>From 2018-2019, highlighted projects were selected in line with IVL's strategy, covering all function areas:</p> <ol style="list-style-type: none"> 1) Environment Health & Safety (EHS) 2) Customer-related (Complaints or New product development) 3) Quality 4) Productivity 5) Reliability 6) Sustainability 7) Cost-savings 8) Manpower development 9) CSR

Development Programs	Program Objectives/Led By	Development Program Outcomes
		<p>Cross-functional teams are formed and projects are undertaken to break silos and enhance the subject's knowledge and experience.</p> <p>Lean Six Sigma strongly supports a strategy focused on sustainability and our values. We have an important opportunity to positively impact our environment along with our company globally.</p>

Developing and implementing the Group Leadership Curriculum

The IVL Leadership Skills Profile is defined around the capabilities needed to implement the long-term Group Strategy, by living the Company's values. The IVL Leadership Curriculum is designed to assist leaders at all levels in developing the skills needed to ensure a sustainable business performance. Having begun in May 2019, it combines existing and new initiatives, training portfolios, coaching and mentoring.

We continue to monitor and explore global learning trends and resources for valuable online learning opportunities as part of a blended set of tools which allows our team to gain knowledge anytime, anywhere. With our newly launched IVL Intranet (InVoLve), we have optimized online learning as "Learning Choices" for our employees to access and to align with standard classroom training, thereby promoting a lifelong learning culture at IVL.

Last but not least, the V-Lead PET & Feedstock Business and IBC Platform were successfully introduced in 2019 and will continue in 2020.

Development Programs	Program Objectives/Led By	Development Program Outcomes
1. IVL Leadership Curriculum	<ul style="list-style-type: none"> Designed to assist leaders at all levels to develop the skills needed to ensure sustainable business performance Combines existing and new initiatives, training portfolios, coaching and mentoring Led by Global HR 	<ul style="list-style-type: none"> The company launched the "Leadership Curriculum" project which aims to develop existing and next-generation leaders globally starting from senior executives to first time junior managers This year, we developed a common IVL Leadership skills profile and communicated to a target group of 200 Global Leaders The Leadership training curriculum will be implemented in 2020 onwards as a long-term development journey
2. Learning choices through IVL's Intranet	<ul style="list-style-type: none"> Blends online learning along with standard classroom training Promotes a life-long learning culture at IVL Led by Global HR 	IVL is promoting a valuable learning opportunity through a leading Massive Open Online Course (MOOC) platform, edX, on our intranet which is available for employees to learn new skills and advance their careers

Development Programs	Program Objectives/Led By	Development Program Outcomes
3. V-Lead PET & Feedstock Business	<ul style="list-style-type: none"> • Develops a leadership pipeline in the respective businesses • Led by a Business Head 	With the successful launch of the V-Lead program for the Fibers business, IVL started the same development initiative for 33 management personnel in the PET and Feedstock segment this year with a focus on specific analysis and strategy development for this segment
4. Indorama Business Council (IBC) Platform	<ul style="list-style-type: none"> • Provides the possibility of discussing and shaping the Company's future direction, through a highly interactive set-up • Led by IVL's Management Team 	The IBC introduced a forum this year for a group of 45 Senior Executives



IBC meeting in November 2019

This important platform allowed senior IBC team members to learn and share innovations across business functions and join strategic discussions among different teams.



The Leadership Skills Profile workshop for targeted leaders has been held since 2019, and is jointly facilitated by senior business leaders and local HR colleagues.

Performance Management

IVL's performance management is the key element to driving the contributions of individuals and achieving positive business results, and begins with setting KPIs and approval targets, a common appraisal scale, and standard calculation formulas to evaluate merit increments and incentives.

It is also closely linked with the individual development ecosystem. This covers past performance, reasons for unmet targets, opportunities, threats and prioritization of actions for the next cycle. Multi-source feedback also continues to remain one of the pivotal tools offering insights on any calibrations needed in regards to leadership competencies. The outcome of these tools

is then used by the Talent Review Committee (TRC). In consultation with the Nomination, Compensation and Corporate Governance Committee, a subcommittee of the board, the Management Team reviews both the adequacy of the succession planning process and the plan for the Group CEO and the Executive Board positions. For other key positions, the TRC ensures successful leadership transitions by periodically implementing plans for the development of the next generation of leaders. Through our pursuit of people development, we will continue to invest in our employees by providing opportunities for them to explore the different facets of experiential learning.



The 2019 Lean Six Sigma Regional Americas and Europe Conference in Queretaro, Mexico (2019) allowed participants to share LSS efforts, learn new techniques, and build networking relationships.

Lean Six Sigma 2019

As we transition to a new decade, it is exciting to review what transpired previously. The past paves the way for a new and better future, and serves as a platform to build a more successful foundation. Our goal is to be in an advantageous position as we move forward. This position does not come by chance, but through hard work, a sound strategy, and excellent methodologies. Lean Six Sigma (LSS) supports our aspirations.

LSS is a continuous improvement program at IVL that helps us build a culture that advances people development and employee engagement. While LSS does have many world-class analytical techniques and a disciplined approach to project work, it is essentially a people-focused endeavor.

In 2019, 1,880 employees attended almost 19,800 LSS program training hours and undertook over 300 projects. Of these projects:

- 17 projects focused on reducing water, energy, and power usage
- 27 projects focused on improving process efficiency
- 226 projects focused on operational improvements generating over USD 9 million in savings

LSS started with four sites in 2014 and grew to 41 sites on 5 continents by 2019. Over 62,896 Six Sigma training hours took place from 2012-2019, resulting in over USD 41 million in savings for the Company. More people got involved in 2019 than ever before.

LSS specifically impacts two of our values: Our People Make the Difference and Diversity is Our Strength.

We know that Our People Make the Difference. In response, we have a program to effectively engage people and stimulate well thought out improvement projects. We create new opportunities for gifted colleagues around the world to work in teams. LSS enhances their natural abilities and gives a them boost to accomplish even more than they could without Lean Six Sigma.

The second value is Diversity is Our Strength. We are a global company that needs a method to transfer valuable knowledge and perspectives across our enterprise. This transfer must be intentional and routine. With Lean Six Sigma's monthly global lesson sharing sessions and regional symposiums, we successfully strengthened this IVL value. From a local perspective, diverse voices are heard through cross-functional project teams. It is impressive that an operator's voice in Thailand can be heard around the world conveyed from a floor-level improvement project via regional and global sharing venues.

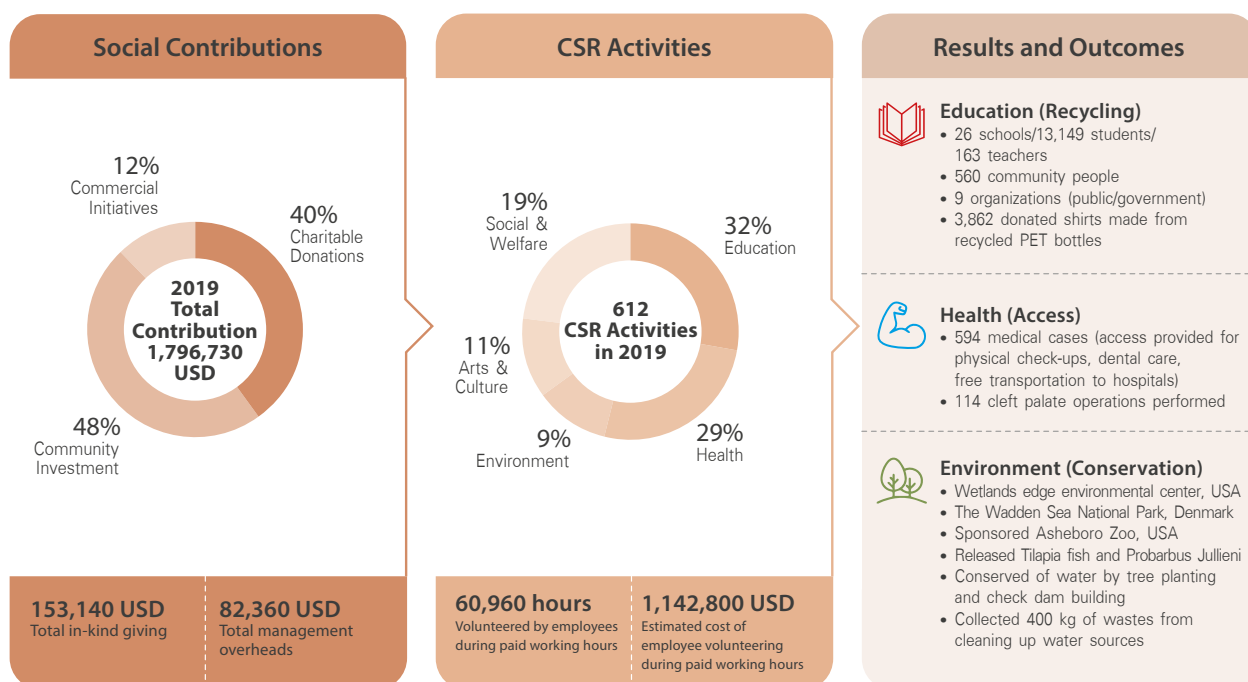
One way that LSS supports sustainability is by making our processes more efficient. We produce less waste and use fewer precious resources. In 2020, the focus will be on engaging more people through LSS. We will look to further integrate Industry 4.0 tools into LSS through the digital excellence belt that is currently in development, and will continue to focus on being a responsible industry leader that empowers passionate, talented people through important projects.

Corporate Social Responsibility

We continue to integrate the idea of creating shared value in each of our three focus areas, Education, Health, and Environment, ensuring they are aligned with our CSR initiatives and have positive business and socio-environmental impacts. At the same time, our group-wide strategy and philanthropy efforts are helping to build relationships with local communities to gain their trust and support. These include building and promoting resilient and sustainable communities through initiatives that support local economic development, better living and improved well-being. We are especially interested

in supporting social programs that benefit a wide range of needs of our communities and stakeholders. Moreover, we aim to be a business that enables increased collaborations and partnerships across borders that drives collective social and environmental impacts at scale.

Our CSR themes fully support the UN Sustainable Development Goals (SDGs). This year, we expanded our CSR activities to include two additional SDGs: SDG 12 (Responsible Consumption and Production) and SDG 17 (Partnerships for the Goals).



13,149 Students	163 Teachers	26 School Visits	371 Teaching Hours
560 Community People	6 Provinces	533 Recycling Materials Downloads	187 Recycling VDO Downloads
22 Public Events	7 Recycling Talks	124 Articles about Recycling	9 Recycling Factory Visits*
791 Recycling Bins Donated	3,862 rPET Shirts Donated	890,310 Bottles Collected Globally	Bottles Back to Factory** 4,970 kg

* Recycling Factory groups visit only in Thailand at Indorama Polyester Industries Public Company Limited (Nakhon Pathom)

** Only bottles back to Indorama Polyester Industries Public Company Limited (Nakhon Pathom), Thailand

We were pleased to engage in programs with local organizations, charity associations and business partners around the world in support of:

- i) healthy lifestyles and well-being to improve the lives and positions of local communities by providing increased health awareness and ensuring the availability of services, including access to better healthcare together with basic infrastructure such as clean water and electricity;
- ii) education in science, technology, engineering, and mathematics, and collaborating with schools and universities to create education programs that fit with and support their initiatives. We are also relying on education to be an important catalyst to providing a wider understanding of the lifecycle analysis of PET, and how we can better play our part; and
- iii) protecting biodiversity through financial contributions and volunteer time to organizations involved in a cleaner and healthier environment, waste removal and clean-up efforts, increasing marine life and protecting their habitats, and by working with partners in support of wildlife and conservation.



For More Information

CSR Global Activity Highlights 2019



Education



Indorama Ventures Xylenes and PTA supported 2019 SWeETY Camp which offered 20 female high school students an opportunity to gain hands-on technical skills that can lead to high-paying, satisfying careers in high growth industries.



Performance Fibers (Kaiping) organized a plant visit and workshop on plant operation and environmental concerns for 60 students and 3 teachers from Kaiping Gangkou Middle School, which is located near the plant.



EcoMex, in coordination with the National Institute for Adult Education (INEA), supported elementary and middle school students, allowing them to complete their studies. Three of our employees are in the process of finishing their middle school education.



Indorama Ventures Corlu PET Sanayi established a 9-month internship program for 9 universities and 7 high school students to work with the company.

CSR Global Activity Highlights 2019



Health



IVL Dhunseri Petrochem Industries India supported 250 residents from the surrounding community by organizing free health check-ups.



IVL's subsidiary in Rayong donated 100,000 baht for the "Run Fast, Stop Stroke" running activity which encourages participants and residents in the community to exercise and maintain good health. Proceeds from the activity were donated to local hospitals.



StarPet employees raised USD 1,000 for Ronald McDonald House which provides assistance and accommodation to families whose children are being treated for serious medical illnesses.



Indorama Ventures Polimeros provides culinary training for mothers of children who study at the Creche California daycare. The objective of this activity is to allow participants to gain knowledge and practice in order to pursue a career in the food industry.

CSR Global Activity Highlights 2019



Environment



Indorama Ventures Poland welcomed two teachers and the 16 winners from the “Ecology for me is...” art competition, who visited their operating site on International Environment Day. The children made beautiful ecological shopping bags and planted 20 trees on the company’s grounds together with company staff.



Indorama Ventures Polimeros worked with 350 community residents to increase awareness on the importance of recycling through activities involving recycled PET bottles. The event demonstrated how recycling is able to create jobs and save the environment. Together, they collected 281 kilograms of PET bottles.



One hundred employees at Indorama Petrochem joined 150 community residents and local organizations to repair, perform maintenance checks and plant 500 trees around the dam at the Poodon Community Forest to support the local environment. This initiative will help increase the collection of rainwater for use during droughts and the dry season, and will help keep the forest green.



Asia PET & Indorama Polymers helped Wat Mudcharin School set up a waste bank and cashless shop where recycled waste can be exchanged for small products. Students were able to learn about waste management through the waste bank.



The IVL Foundation was registered and began operating in May 2018 to support communities in Thailand. The Foundation largely collaborates with other charities, associations and non-profit organizations, while some initiatives are carried out directly together with company volunteers to achieve our four key objectives:

1. To support activities focused on quality of life for the poor, elderly, and underprivileged.
2. To promote sports activities and cooperate with relevant organizations for the well-being of society.
3. To prevent wildlife trafficking and support conservation.
4. To help victims of natural disasters.

The IVL Foundation's projects and achievements in 2019 included:

Raising Public Awareness about Waste Management

The Waste Management project was initiated by the IVL Foundation to support conservation efforts and environmental sustainability. In order to increase public awareness on proper waste separation and recycling to solve the waste issue and other associated health concerns, the IVL Foundation will provide almost 300 recycle waste bins and 100 containers for post-consumed PET plastic bottles to over 50 venues including embassies, schools, medical centers/hospitals, temples and offices located in Bangkok, Nakhon Pathom, Rayong and Lopburi.

Apart from providing recycling waste bins for the public, we also donated numerous education materials focused on waste separation and recycling. In 2019, a total of 228 sets of education materials together with 3 recycling bins and 73 containers to collect bottles were given to 84 organizations including 39 schools, 9 embassies, 23 temples, 6 hospitals and 7 workplaces. A total of 19 organizations received short education programs and training courses on waste separation and recycling. The IVL Foundation hopes to improve society's focus on responsible consumption and helps achieve a better tomorrow.





Educating Young Unregistered Refugees in Bangkok

The IVL Foundation sponsored the Good Shepherd Home Foundation which runs an education program for 70 young unregistered refugees in Bangkok from Vietnam, Pakistan, North Korea, Iraq, Afghanistan, Cambodia, and Palestine. This education program is preparing the refugees, aged 3-19 years, with competencies in the Thai and English languages along with mathematics and Thai culture.

Professional Development for Science Teachers in Rayong

The IVL Foundation supports Kenan Foundation Asia, which works in partnership with Thailand's Ministry of Education to inspire students, develop skilled teachers, and grow strong school leaders. Kenan organized the 'Teacher Professional Development Program' for science teachers and an 'innovation camp' for students in Rayong ensuring they receive a 21st century education and are prepared for the careers of tomorrow. A total of 32 teachers from 30 schools participate in the development program, while 58 secondary high school students participated in the innovation camp.



The Rajanukul Institute supports disabled children in collaboration with the IVL Foundation

The IVL Foundation, having been approached by the Rajanukul Institute to help with the development and advancement of autistic children, donated 30 sets of creative and sensory toys which will be part of the children's educational tools. The goal is to increase the engagement of autistic kids, allow for creativity, and improve their development. The Rajanukul Institute has distributed more than half of the donated toy sets to 16 hospitals for use by autistic children while the rest of the toy sets will be shared among 16 internal units of the institute.

Safe, Free Surgeries to Address Facial Deformities in Mae Hong Son and Surin Provinces

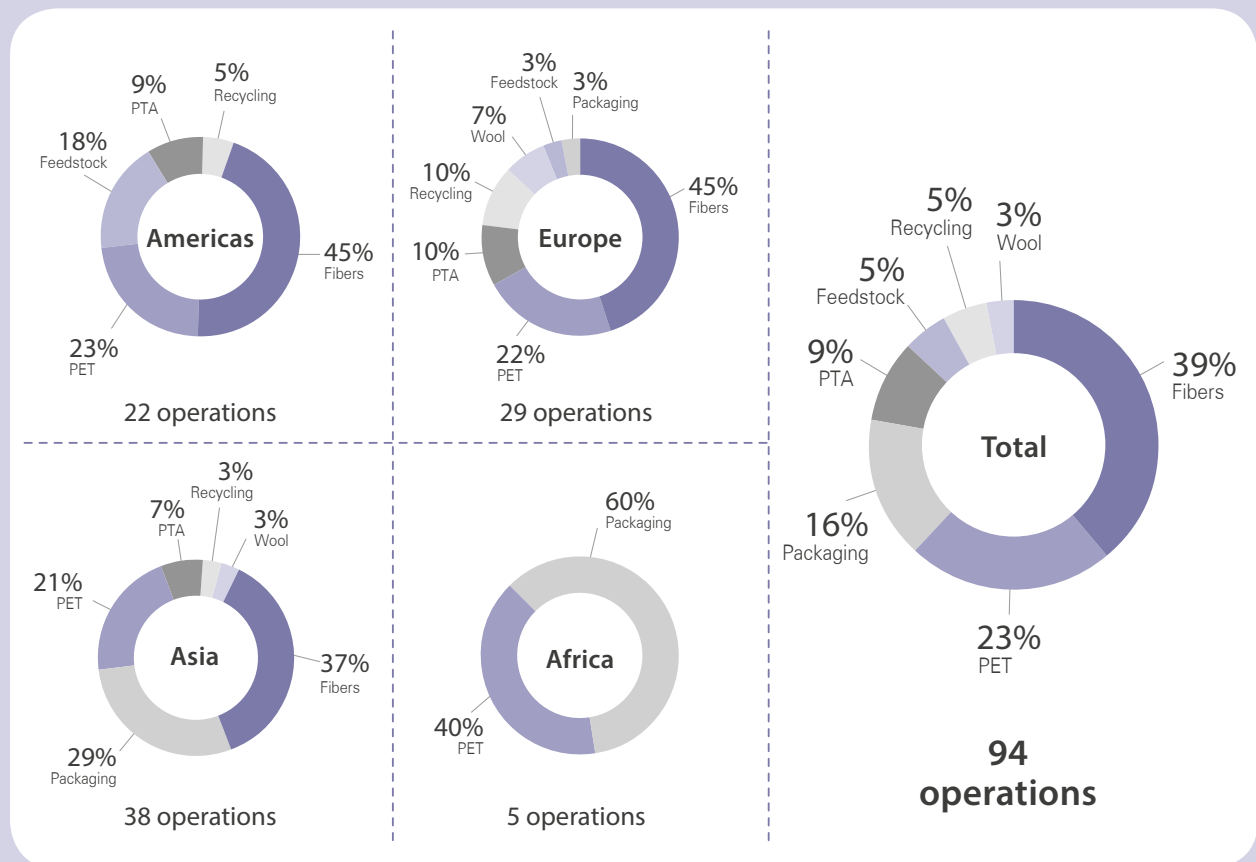
The IVL Foundation sponsored Operation Smile Thailand, which provides surgeries to underprivileged children and young adults at no cost to address facial deformities such as cleft lips, cleft palates and burns. In 2019, 63 patients were treated in Mae Hong Son province and 51 patients were treated in Surin province during a week-long medical mission.



GLOBAL PERFORMANCE DATA



Our 2019 Sustainability Report covers 94 sites across the globe in all business units including Feedstock (PTA, PIA, EO/EG, PX, NDC), PET, Fibers, Packaging, Recycling and Wool as listed below by regions.



Coverage of Data Collection (% of IVL Total Global Production)

Material Indicators	2016	2017	2018	2019
Total energy consumption	100	100	100	100
Direct GHG Emissions Scope 1	100	100	100	100
Indirect GHG Emissions Scope 2	100	100	100	100
Total NOx Emissions	95.2	100	100	100
Total SOx Emissions	83.9	100	100	100
Total VOC Emissions	77.4	100	100	100
Total waste (excluding reuse and recycle)	100	100	100	100
COD in treated wastewater discharge	93.5	100	100	100
BOD in treated wastewater discharge	83.9	100	100	100
Total water withdrawn by sources	100	100	100	100
Wastewater discharge	98.4	100	100	100
Occupational Health & Safety	100	100	100	100
Process safety events	10	30	50	100
Spills	88	100	100	100
CSR	79	91	94	88.3
HR	100	100	100	100

Information on Operations Included in the 2019 Sustainability Report

REGION	COUNTRY	BUSINESS
Americas		
AlphaPet, Inc.	USA	●
Auriga Polymers Inc.	USA	● ●
Avgol America Inc.	USA	●
FiberVisions Manufacturing Company	USA	●
FiberVisions Products, Inc.	USA	●
Indorama Ventures (Oxide & Glycols) LLC	USA	○
Indorama Ventures Fibras Brazil Ltda	Brazil	●
Indorama Ventures Polymers Mexico, S. de R.L. de C.V.	Mexico	● ●
Indorama Ventures Polymeros S.A.	Brazil	●
Indorama Ventures PTA Montreal LP	Canada	●
Indorama Ventures Sustainable Solutions LLC	USA	●
Indorama Ventures Xylenes and PTA LLC	USA	● ○ ○ ○ NDC, PIA, PX
Performance Fibers Operations Mexico, S. de R.L. de C.V.	Mexico	●
PHP Fibers Inc.	USA	●
StarPet Inc.	USA	●
UTT de Mexico Technical Textiles S.A. de C.V.	Mexico	●
Winnsboro Fibres LLC	USA	●
Europe		
Avgol Limited Liability Company	Russia	●
Beverage Plastics Limited	Northern Ireland	●
FiberVisions A/S	Denmark	●
Glanzstoff Bohemia s.r.o.	Czech Republic	●
Glanzstoff Industries S.R.L.	Italy	●
Glanzstoff Longlaville S.A.S.	France	●
Indorama Ventures Corlu PET Sanayi Anonim Sirketi	Turkey	●
Indorama Ventures Europe B.V.	The Netherlands	● ○
Indorama Ventures Poland Sp. z o.o.	Poland	●
Indorama Ventures Polymers Germany GmbH	Germany	●
Indorama Ventures Portugal PTA - Unipessoal, LDA.	Portugal	●
Indorama Ventures Quimica S.L.U.	Spain	● ● ○ PIA
Kordarna Plus a.s.	Czech Republic	●
Kordarna Plus a.s.	Slovakia	●
PHP Fibers GmbH	Germany	●
Schoeller GmbH & Co KG	Austria	●
Schoeller Kresice s.r.o.	Czech Republic	●
Textilcord Steinfort S.A.*	Luxembourg	●
Trevira GmbH, Bobingen	Germany	●
Trevira GmbH, Guben	Germany	●
UAB Orion Global Pet	Lithuania	●
UTT Technische Textilien GmbH & Co.	Germany	●
Wellman France Recyclage S.A.S	France	●
Wellman International Limited, Ireland	Ireland	●
Wellman International Limited, The Netherlands	The Netherlands	●
Wellman Neufchateau Recyclage S.A.	France	●

REGION	COUNTRY	BUSINESS
Asia		
Asia Pet (Thailand) Limited	Thailand	●
Avgol India Private Limited	India	●
Avgol Limited (Bagan)	Israel	●
Avgol Limited (Dimona)	Israel	●
FiberVisions (China) Textiles Products Limited	China	●
Glanzstoff Industries (Qingdao) Co., Ltd.	China	●
Guangdong IVL PET Polymer Company Limited	China	●
Hubei Gold Dragon Nonwoven Fabrics Co. Ltd.**	China	●
Indorama Holdings Limited	Thailand	●
Indorama Petrochem Limited	Thailand	●
Indorama Petrochem Limited (2 nd Branch)	Thailand	●
Indorama Polyester Industries Public Company Limited, Nakhon Pathom	Thailand	● ●
Indorama Polyester Industries Public Company Limited, Rayong	Thailand	● ●
Indo Rama Synthetics (India) Limited	India	●
Indorama Ventures Packaging (Myanmar) Limited	Myanmar	●
Indorama Ventures Packaging (Philippines) Corporation, Bacolod	The Philippines	●
Indorama Ventures Packaging (Philippines) Corporation, Batino	The Philippines	●
Indorama Ventures Packaging (Philippines) Corporation, Davao	The Philippines	●
Indorama Ventures Packaging (Philippines) Corporation, Meycauayan	The Philippines	●
Indorama Ventures Packaging (Philippines) Corporation, MOP	The Philippines	●
IVL Dhunseri Petrochem Industries Private Limited (Haldia)	India	●
IVL Dhunseri Petrochem Industries Private Limited (Panipat)	India	●
Performance Fibers (Kaiping) Company Limited	China	●
Performance Fibers (Kaiping) No.2 Company Limited	China	●
Performance Fibers (Kaiping) No.3 Company Limited	China	●
Petform (Thailand) Limited, Korat	Thailand	●
Petform (Thailand) Limited, Lopburi	Thailand	● ●
Petform (Thailand) Limited, Pathumthani	Thailand	●
Petform (Thailand) Limited, Rayong	Thailand	●
PT Indorama Petrochemicals	Indonesia	●
PT Indorama Polychem Indonesia	Indonesia	●
PT Indorama Polypet Indonesia	Indonesia	●
PT Indorama Ventures Indonesia	Indonesia	● ●
TPT Petrochemicals Public Company Limited	Thailand	●
Africa		
Egyptian Indian Polyester Company S.A.E.	Egypt	●
Indorama PET (Nigeria) Limited	Nigeria	●
Indorama Ventures Packaging (Ghana) Limited	Ghana	●
Indorama Ventures Packaging (Nigeria) Limited	Nigeria	●
Medco Plast Co. for Packing & Packaging Systems (S.A.E.)	Egypt	●

Remarks:

○ Feedstock ● PTA ● PET ● Fibers ● Packaging ● Recycling ● Wool
NDC = Naphthalene Dicarboxylate PIA = Purified Isophthalic Acid PX = Paraxylene

* One of the five Glanzstoff sites, the other four are Glanzstoff Bohemia, Glanzstoff Industries S.R.L., Glanzstoff Industries (Qingdao) and Glanzstoff Longlaville S.A.S.

** One of the five Avgol sites, the other four are Avgol America Inc., Avgol India Private Limited, Avgol Limited Liability Company, Avgol Limited (Bagan) and Avgol Limited (Dimona)

Global Performance Data

GRI Standards		Unit	2016	2017	2018	2019
Production						
General	Total production (captive consumption)	Ton of production	9,479,184	10,004,534	11,338,992	12,780,005
	PET	Ton	3,632,085	3,648,922	4,211,040	5,167,714
	PTA	Ton	3,412,773	3,735,362	4,192,671	4,191,627
	Packaging	Ton	113,202	134,838	155,319	226,184
	Fibers	Ton	1,344,039	1,320,941	1,438,564	1,793,043
	Feedstock (e.g. IPA/PX/NDC)	Ton	872,173	1,057,123	1,236,703	880,183
	Wool	Ton	2,673	2,188	2,712	6,622
	Recycling production (fakes+in process reuse)	Ton	102,239	105,160	101,983	206,996
	Olefins	Ton	0	0	0	307,634
Revenue						
General	Total revenues (including inter-company sales)	USD (million)	8,655	10,575	12,933	14,089
Materials						
301-1	Total material used	Ton	9,846,945	10,656,101	11,418,542	13,058,127
	Raw materials					
	- PTA	Ton	3,802,674	4,061,686	4,281,652	5,195,207
	- MEG	Ton	1,453,127	1,492,315	1,647,427	2,034,280
	- Paraxylene	Ton	2,271,643	2,452,829	2,755,828	2,751,180
	- Acetic acid	Ton	124,232	139,606	162,234	168,183
	- Purified isophthalic acid	Ton	44,479	64,042	70,510	88,511
	- PET	Ton	302,352	259,809	302,396	405,181
	- PP	Ton	131,853	123,825	118,622	274,540
	- PE	Ton	32,504	37,193	67,172	55,494
	- HDPE	Ton	4,538	5,481	7,134	9,140
	- Wool	Ton	2,938	2,521	2,600	5,096
	- Cardboard packaging	Ton	11,096	39,556	3,516	57,745
	- Partially oriented yarn (POY) + Textile grade chips	Ton	24,506	21,150	0	4,009
	Bio-raw materials					
	- Bio-MEG	Ton	10,718	7,447	15,808	9,130
	- Cellulose	Ton	-	11,043	11,004	10,079
	- PLA	Ton	-	2,383	1,088	2,023
	Others	Ton	1,490,979	1,791,707	1,830,309	1,781,332
301-2	Total recycled materials	Ton	139,306	143,507	141,242	206,996
Energy						
302-1	Total energy consumption	GJ	51,219,219	55,070,650	59,984,718	73,452,756
	• Fuel oil	GJ	289,919	89,531	109,772	308,901
	• Natural gas	GJ	21,725,557	23,905,980	28,089,267	31,777,505
	• LPG	GJ	43,109	71,919	60,629	69,024
	• Diesel	GJ	66,716	90,493	150,835	188,489
	• Gasoline	GJ	32,272	31,971	30,422	28,782
	• Fuel gas	GJ	9,945	31,676	7,709	-
	• Coal	GJ	14,436,785	13,921,799	14,143,189	23,190,958
	• Other	GJ	463,662	27,371	101,404	66,495
	• Renewable energy consumption	GJ	885,249	1,348,403	1,324,546	1,086,515
	Biomass	GJ	373,656	855,872	901,065	658,703
	Biogas	GJ	511,593	492,531	423,481	427,812
	• Direct energy sold	GJ	(1,276,304)	(1,416,948)	(1,961,330)	(2,422,922)
	Total indirect energy consumption (electricity, cooling, steam purchased from outside of IVL group)	GJ	14,542,309	16,968,455	17,928,274	19,159,008
		MWh	4,115,769	4,713,460	4,980,076	5,321,947
	- Electricity purchased from conventional sources (e.g. natural gas, coal, nuclear, heating oil)	GJ	11,486,827	11,934,309	12,684,116	14,060,847
		MWh	3,190,785	3,315,086	3,523,366	3,905,791
	- Purchased steam	GJ	2,238,688	3,763,243	3,723,250	3,492,387
		MWh	621,858	1,045,345	1,034,236	970,108
	- Purchased heating	GJ	805,571	414,514	428,143	489,516
		MWh	223,770	115,143	118,929	135,977
	- Purchased cooling	GJ	133,308	371,063	300,998	292,655
		MWh	37,030	103,073	83,611	81,293
	- Renewable electricity generated and consumed	GJ	6,278	6,237	6,072	11,964
		MWh	1,744	1,733	1,687	3,323
	- Renewable electricity purchased through certificate	GJ	149,558	1,221,327	1,423,629	1,489,077
		MWh	41,544	339,257	395,453	413,633
	Total direct electricity sold	GJ	86,376	421,526	417,225	396,190
		MWh	23,993	117,091	115,896	110,053

GRI Standards		Unit	2016	2017	2018	2019
	Total steam sold	GJ	188,085	257,933	165,745	221,703
		MWh	52,246	71,648	46,040	61,584
	Total indirect electricity sold	GJ	3,461	62,778	54,964	59,547
		MWh	961	17,438	15,268	16,541
302-3	Energy intensity	GJ/Ton of production	5.40	5.50	5.29	5.75
302-4	Energy saved due to conservation and efficiency improvements	GJ	786,520	614,892	416,617	756,216
Water Withdrawal and Consumption						
303-1	Total water withdrawn by sources	m ³	46,295,100	53,552,616	60,285,763	65,222,820
	- Surface water	m ³	28,612,964	32,036,781	34,920,909	35,480,047
	- Once through cooling water	m ³	1,245,728	2,533,355	1,681,646	263,010
	- Municipal water and water utilities	m ³	10,632,287	13,630,142	18,229,684	21,826,915
	- Groundwater	m ³	5,761,373	5,263,939	5,341,836	7,630,654
	- Rainwater	m ³	42,748	88,398	111,689	22,194
	Water intensity	m ³ /Ton of production	4.88	5.35	5.32	5.10
Reused/Recycled Water						
303-3	Total volume of recycled/reused water	m ³	3,053,241	4,699,568	5,292,534	5,255,856
	% of recycled/reused water	%	6.19	8.07	8.07	7.46
Emissions						
305-1	Direct GHG emissions of all sources owned or controlled by company (Scope 1 emissions)	tCO ₂ e	3,109,687	3,211,409	3,688,970	4,744,746
305-2	Indirect GHG emissions resulting from the generation of electricity, heat, or steam (Scope 2 emissions)	tCO ₂ e	1,979,668	2,316,591	2,224,494	2,344,695
	Total GHG emissions (Scope 1 + Scope 2)	tCO ₂ e	5,089,355	5,528,000	5,913,464	7,089,441
305-4	Scope 1 GHG intensity	tCO ₂ e/Ton of production	0.328	0.321	0.325	0.371
	Scope 2 GHG intensity	tCO ₂ e/Ton of production	0.209	0.232	0.197	0.184
	Scope 1 + Scope 2 GHG intensity	tCO ₂ e/Ton of production	0.537	0.553	0.522	0.555
	GHG intensity in tons of CO ₂ e per currency total revenue	tCO ₂ e/USD (million)	588.02	522.74	457.24	503.19
	GHG intensity in tons of CO ₂ e per full time equivalent (FTE) employees	tCO ₂ e/FTE	352.64	363.80	371.40	312.37
305-7	Total NO _x emissions	Ton	1,642	2,559	2,879	4,659
	Total SO _x emissions	Ton	927	1,518	1,970	4,993
	Total VOC emissions	Ton	2,042	2,078	4,642	2,123
Wastewater Discharge						
306-1	Total water discharge volume	m ³	22,131,959	32,222,930	33,659,202	28,812,422
	COD in treated wastewater discharged	Ton	1,164	1,542	2,357	1,693
	BOD in treated wastewater discharged	Ton	112	100	357	328
	TSS in treated wastewater discharged	Ton	1,659	295	478	532
	Oil and grease in treated wastewater discharged	Ton	-	15.60	16.70	20.45
	COD in untreated wastewater discharged to third party	Ton	3,781	4,090	4,374	2,578
	BOD in untreated wastewater discharged to third party	Ton	1,602	888	793	420
	TSS in untreated wastewater discharged to third party	Ton	1,034	421	302	146
	Oil and grease in treated wastewater discharged to third party	Ton	4.04	8.01	5.41	5.79
Solid Waste						
306-2	Total hazardous waste	Ton	47,448	54,001	51,379	74,344
	- Reuse	Ton	720	30,248	28,959	43,574
	- Recycling	Ton	12,037	4,725	2,960	4,796
	- Recovery (including energy recovery)	Ton	2,153	1,748	2,188	2,542
	- Composting	Ton	43	-	-	0
	- Incineration	Ton	4,860	11,183	9,616	9,996
	- Landfill	Ton	2,348	5,376	7,349	12,260
	- Others	Ton	25,288	721	306	1,175
	Total non-hazardous waste	Ton	100,300	110,151	119,570	243,104
	- Reuse	Ton	5,864	5,810	7,960	120,151
	- Recycling	Ton	28,221	36,616	43,990	43,423
	- Recovery (including energy recovery)	Ton	5,642	5,919	11,959	12,835
	- Composting	Ton	6,143	5,911	6,850	11,235
	- Incineration	Ton	779	1,367	1,080	1,080
	- Landfill (General waste)	Ton	27,831	35,746	38,609	49,596
	- Others	Ton	25,820	18,781	9,122	4,784
	Total Reused, Recycled and Recovered waste	Ton	54,637	85,066	98,017	227,321
	Total waste disposed (not Reused, Recycled or Recovered)	Ton	93,112	79,086	72,932	90,127
306-4	Total weight of hazardous waste transported	Ton	43,869	57,724	48,388	67,709
	Total weight of hazardous waste treated	Ton	6,724	5,530	5,985	1,821
	The total weight of hazardous waste shipped internationally	Ton	25	183	362	261

GRI Standards		Unit	2016	2017	2018	2019
Spills						
306-3	Total significant spills	Case	38	42	18	20
		Ton	90	513	28	89
	- Hydrocarbon spills	Case	2	4	5	6
		Ton	0	7	13	6
	- Chemical spills	Case	31	26	13	14
		Ton	50	30	15	83
	- Other spills	Case	5	12	0	0
		Ton	39	476	0	0
Process Safety Events						
Tier 1						
	- No. of events	Case	0	5	8	24
	- Rate	Case/Million man-hours	0	0.48	0.43	0.44
Tier 2						
	- No. of events	Case	1	3	4	14
	- Rate	Case/Million man-hours	0.31	0.29	0.21	0.26
Environmental Compliance						
307-1	ALL FINES: Monetary value of ALL fines for non-compliance with environmental laws and regulations	USD	260	54,618	36,607	0
	FINES OVER USD 10,000: Monetary value of significant fines over USD 10,000 for non-compliance with environmental laws and regulations	USD	0	47,233	36,607	0
	Total number of non-monetary sanctions for non-compliance with environmental laws and regulations	Case	2	0	0	0
	Total number of non-monetary sanctions for non-compliance with environmental laws and regulations were incurred	Case	2	0	0	0
Employees						
102-8	Total employees	Person	14,432	15,195	15,922	22,696
	- Male	Person	11,257	11,844	12,524	17,749
	- Female	Person	3,175	3,351	3,398	4,947
	Total contractors	Person	2,811	2,115	3,234	6,904
	- Male	Person	2,277	1,704	2,730	6,137
	- Female	Person	534	411	504	767
Occupational Health and Safety						
403-1	Total workforce represented in formal joint management - worker health and safety committees	Person	3,650	12,461	13,118	19,310
	Percentage of workforce represented in formal joint management - worker health and safety committees	%	25.29	82.01	82.39	91.43
403-2	Total Recordable Injury Rate (TRIR)	No/200,000 man-hours	1.00	1.19	1.29	1.45
	Employees	No/200,000 man-hours	1.05	1.21	1.41	1.59
	- Male	No/200,000 man-hours	1.12	1.41	1.52	1.60
	- Female	No/200,000 man-hours	0.77	0.50	0.98	1.57
	Contractors	No/200,000 man-hours	0.80	1.10	0.78	0.96
	- Male	No/200,000 man-hours	0.94	1.35	0.87	0.96
	- Female	No/200,000 man-hours	0	0	0.33	0.99
	Total Recordable Injuries (not including first aid incidents)	Case	151	206	241	394
	Employees	Case	126	176	214	335
	- Male	Case	109	160	184	270
	- Female	Case	17	16	30	65
	Contractors	Case	25	30	27	59
	- Male	Case	25	30	25	52
	- Female	Case	0	0	2	7
	Lost Time Injury Frequency Rate (LTIFR)	No/Million man-hours	2.95	3.61	3.71	4.18
	Employees	No/Million man-hours	3.18	3.98	4.16	5.07
	- Male	No/Million man-hours	3.13	4.40	4.47	4.77
	- Female	No/Million man-hours	3.40	2.49	2.93	6.30
	Contractors	No/Million man-hours	2.08	1.65	1.73	1.14
	- Male	No/Million man-hours	2.44	2.03	1.92	1.10
	- Female	No/Million man-hours	0	0	0.82	1.43
	Total Lost Time Injuries	Case	89	125	138	227
	Employees	Case	76	116	126	213
	- Male	Case	61	100	108	161
	- Female	Case	15	16	18	52
	Contractors	Case	13	9	12	14
	- Male	Case	13	9	11	12
	- Female	Case	0	0	1	2

GRI Standards		Unit	2016	2017	2018	2019
403-3	Occupational Illness Frequency Rate (OIFR)	No/Million man-hours	0.07	0.14	0	0.02
	Employees	No/Million man-hours	0.08	0.03	0	0.02
	- Male	No/Million man-hours	0.10	0.04	0	0.03
	- Female	No/Million man-hours	0	0	0	0
	Contractors	No/Million man-hours	0	0.73	0	0
	- Male	No/Million man-hours	0	0.90	0	0
	- Female	No/Million man-hours	0	0	0	0
	Total number of occupational disease cases	Case	2	5	0	1
	Employees	Case	2	1	0	1
	- Male	Case	2	1	0	1
	- Female	Case	0	0	0	0
	Contractors	Case	0	4	0	0
	- Male	Person	0	4	0	0
	- Female	Person	0	0	0	0
	Fatalities (all employees and contractors)	Person	0	0	0	1
	Employees	Person	0	0	0	0
	- Male	Person	0	0	0	0
	- Female	Person	0	0	0	0
	Contractors	Person	0	0	0	1
	- Male	Person	0	0	0	1
	- Female	Person	0	0	0	0
	Lost Day Rate (LDR)	Days/Million man-hours	42	51	66	104
	Employees	Days/Million man-hours	47	51	77	124
	- Male	Days/Million man-hours	43	58	87	106
	- Female	Days/Million man-hours	62	28	37	198
	Contractors	Days/Million man-hours	26	47	17	34
	- Male	Days/Million man-hours	30	57	17	37
	- Female	Days/Million man-hours	0	0	17	19
	Total number of lost days (only including lost scheduled work days)	Man Days	1,275	1,754	2,452	5,649
	Employees	Man Days	1,116	1,499	2,336	5,225
	- Male	Man Days	842	1,322	2,106	3,590
	- Female	Man Days	273	177	230	1,635
	Contractors	Man Days	160	255	116	424
	- Male	Man Days	160	255	95	398
	- Female	Man Days	-	-	21	26
	Absentee Rate (AR)	%	2.21	2.05	2.01	1.99
	Employees	%	2.60	2.37	2.40	2.38
	- Male	%	2.39	2.37	2.34	2.02
	- Female	%	3.55	2.38	2.65	3.87
	Contractors	%	0.70	0.37	0.32	0.65
	- Male	%	0.54	0.29	0.29	0.66
	- Female	%	1.61	0.71	0.46	0.54
	Absentee days	Days	83,206	88,825	93,668	135,091
	Employees	Days	77,779	86,318	90,871	125,176
	- Male	Days	58,178	67,179	70,527	85,194
	- Female	Days	19,601	19,139	20,344	39,982
	Contractors	Days	5,427	2,507	2,797	9,915
	- Male	Days	3,577	1,609	2,098	8,966
	- Female	Days	1,850	898	699	949
	Near miss	Case	720	959	1,870	3,015
	Employees	Case	643	861	1,750	2,531
	- Male	Case	575	726	1,611	2,357
	- Female	Case	68	135	139	174
	Contractors	Case	77	98	120	484
	- Male	Case	68	90	118	474
	- Female	Case	9	8	2	10
	Workers with high incidence or high risk of diseases related to their occupation	Person	882	402	744	652
	Employees	Person	825	307	703	584
	- Male	Person	789	307	587	470
	- Female	Person	36	0	116	114
	Contractors	Person	57	95	41	68
	- Male	Person	54	91	37	58
	- Female	Person	3	4	4	10

Global Human Resources Data

GRI Standards		Unit	2016	2017	2018	2019
Employees						
405-1	Total employees by gender	Person	14,432	15,195	15,922	22,696
	- Male	Person	11,257	11,844	12,524	17,749
	- Female	Person	3,175	3,351	3,398	4,947
	Total permanent employees	Person	13,769	14,525	15,221	22,027
	- Male	Person	10,718	11,299	11,944	17,225
	- Female	Person	3,051	3,226	3,277	4,802
	Total temporary employees	Person	663	670	701	669
	- Male	Person	539	545	580	524
	- Female	Person	124	125	121	145
	Total employees by level*	Person	13,769	14,525	15,221	22,027
	• Executive Management	Person	88	94	101	109
	- Male	Person	79	83	88	95
	- Female	Person	9	11	13	14
	• Senior Management	Person	369	388	414	577
	- Male	Person	286	301	320	468
	- Female	Person	83	87	94	109
	• Middle Management	Person	1,409	1,485	1,619	2,341
	- Male	Person	1,125	1,185	1,281	1,820
	- Female	Person	284	300	338	521
	• Junior Management	Person	5,778	6,106	5,831	8,495
	- Male	Person	4,028	4,246	3,521	5,097
	- Female	Person	1,750	1,860	2,310	3,398
	• Non-Management*	Person	6,125	6,452	7,256	10,505
	- Male	Person	5,200	5,484	6,734	9,745
	- Female	Person	925	968	522	760
	Total employees by age*	Person	13,769	14,525	15,221	22,027
	• Over 50 years old	Person	2,153	2,488	3,328	5,033
	- Male	Person	1,810	2,118	2,742	4,027
	- Female	Person	343	370	586	1,006
	• 30-50 years old	Person	8,222	8,542	9,024	13,199
	- Male	Person	6,210	6,412	6,896	10,191
	- Female	Person	2,012	2,130	2,128	3,008
	• Below 30 years old	Person	3,394	3,495	2,869	3,795
	- Male	Person	2,698	2,769	2,306	3,007
	- Female	Person	696	726	563	788
New employees hires*						
401-1	Total new employees	Person	1,484	1,732	1,758	2,042
	- Male	Person	1,054	1,274	1,216	1,464
	- Female	Person	430	458	542	578
	Total new employee hire rate	New hire rate (%)	10.78	11.92	11.55	9.27
	- Male	New hire rate (%)	9.83	11.28	10.18	8.50
	- Female	New hire rate (%)	14.09	14.20	16.54	12.04
	Total new employees by age	Person	1,484	1,732	1,758	2,042
	• Over 50 years old	Person	102	99	93	145
	- Male	Person	93	80	74	105
	- Female	Person	9	19	19	40
	• 30-50 years old	Person	691	698	754	897
	- Male	Person	500	485	497	621
	- Female	Person	191	213	257	276
	• Below 30 years old	Person	691	935	911	1,000
	- Male	Person	461	709	645	738
	- Female	Person	230	226	266	262
	Total new employee hire rate by age	New hire rate (%)	10.78	11.92	11.55	9.27
	• Over 50 years old	New hire rate (%)	4.74	3.98	2.79	2.88
	- Male	New hire rate (%)	5.14	3.78	2.70	2.61
	- Female	New hire rate (%)	2.62	5.14	3.24	3.98
	• 30-50 years old	New hire rate (%)	8.40	8.17	8.36	6.80
	- Male	New hire rate (%)	8.05	7.56	7.21	6.09
	- Female	New hire rate (%)	9.49	10.00	12.08	9.18
	• Below 30 years old	New hire rate (%)	20.36	26.75	31.75	26.35
	- Male	New hire rate (%)	17.09	25.60	27.97	24.54
	- Female	New hire rate (%)	33.05	31.13	47.25	33.25

GRI Standards		Unit	2016	2017	2018	2019
Employees Turnover*		Full time employees				
401-1	Total employee turnover	Person	1,599	1,556	1,363	2,093
	- Male	Person	1,190	1,203	1,021	1,502
	- Female	Person	409	353	342	591
	Total employee turnover rate	Turnover rate (%)	11.61	10.71	8.95	9.50
	- Male	Turnover rate (%)	11.10	10.65	8.55	8.72
	- Female	Turnover rate (%)	13.41	10.94	10.44	12.31
	Total employee turnover by age	Person	1,599	1,556	1,363	2,093
	• Over 50 years old	Person	303	353	388	411
	- Male	Person	233	284	309	304
	- Female	Person	70	69	79	107
	• 30-50 years old	Person	770	748	554	949
	- Male	Person	552	577	383	642
	- Female	Person	218	171	171	307
	• Below 30 years old	Person	526	455	421	733
	- Male	Person	405	341	328	556
	- Female	Person	121	114	93	177
	Total employee turnover rate by age	Turnover rate (%)	11.61	10.71	8.95	9.50
	• Over 50 years old	Turnover rate (%)	14.07	14.19	11.66	8.17
	- Male	Turnover rate (%)	12.87	13.41	11.27	7.55
	- Female	Turnover rate (%)	20.41	18.65	13.48	10.64
	• 30-50 years old	Turnover rate (%)	9.37	8.76	6.14	7.19
	- Male	Turnover rate (%)	8.89	9.00	5.55	6.30
	- Female	Turnover rate (%)	10.83	8.03	8.04	10.21
	• Below 30 years old	Turnover rate (%)	15.50	13.02	14.67	19.31
	- Male	Turnover rate (%)	15.01	12.31	14.22	18.49
	- Female	Turnover rate (%)	17.39	15.70	16.52	22.46
	Voluntary employee turnover	Person	992	1,039	1,137	1,695
	Voluntary employee turnover rate	Turnover rate (%)	7.20	7.15	7.47	7.70
	Number of employee laid off	Person	89	113	81	0
	- Male	Person	89	107	69	0
	- Female	Person	0	6	12	0
	Number of negotiations	Person	28	35	36	0
Parental Leave*						
401-3	Number of employees entitled for parental leave	Person	5,448	8,382	9,750	14,717
	- Male	Person	4,299	6,114	7,429	10,675
	- Female	Person	1,149	2,268	2,321	4,042
	Number of employees who took parental leave	Person	224	368	768	863
	- Male	Person	149	264	543	601
	- Female	Person	75	104	225	262
	Number of employees who returned to work after taking parental leave	Person	194	345	639	726
	- Male	Person	143	257	494	559
	- Female	Person	51	88	145	167
	Return to work rate (after parental leave)	%	86.61	93.75	83.20	84.13
	- Male	%	95.97	97.35	90.98	93.01
	- Female	%	68.00	84.62	64.44	63.74
	Retention to work (after parental leave and still employed for the next 12 months)	Person	171	325	603	693
	- Male	Person	131	239	465	532
	- Female	Person	40	86	138	161
	Retention rate (after parental leave and still employed for the next 12 months)	%	88.14	94.20	94.37	95.45
	- Male	%	91.61	93.00	94.13	95.17
	- Female	%	78.43	97.73	95.17	96.41
Employees training*						
404-1	Total training hours provided to employees	Hour	284,356	329,779	463,175	728,206
	- Male	Hour	211,450	247,584	352,338	552,725
	- Female	Hour	72,906	82,195	110,837	175,481
	Total average training hours	Hour/Employee	20.65	22.70	30.43	33.06
	- Male	Hour/Employee	19.73	21.91	29.50	32.09
	- Female	Hour/Employee	23.90	25.48	33.82	36.54

GRI Standards		Unit	2016	2017	2018	2019
	Total training hours by management category	Hour	284,356	329,779	463,175	728,206
	• Executive Management	Hour	2,349	2,676	3,077	3,604
	- Male	Hour	2,077	2,324	2,675	3,141
	- Female	Hour	272	352	402	463
	• Senior Management	Hour	8,537	9,489	10,687	19,075
	- Male	Hour	6,717	7,228	7,987	15,472
	- Female	Hour	1,820	2,261	2,700	3,604
	• Middle Management	Hour	23,726	32,629	38,734	77,393
	- Male	Hour	17,979	26,023	29,034	58,053
	- Female	Hour	5,747	6,606	9,700	19,340
	• Junior Management	Hour	115,958	144,175	200,014	280,842
	- Male	Hour	88,521	111,341	145,014	202,226
	- Female	Hour	27,437	32,834	55,000	78,616
	• Non-management	Hour	133,786	140,810	210,663	347,292
	- Male	Hour	96,156	100,668	167,628	273,833
	- Female	Hour	37,630	40,142	43,035	73,459
Performance Review*						
404-3	Total employees receiving regular performance reviews	Person	13,769	14,525	15,221	22,027
	• Executive Management	Person	88	94	101	109
	• Senior Management	Person	369	388	414	577
	• Middle Management	Person	1,409	1,485	1,619	2,341
	• Junior Management	Person	5,778	6,106	5,831	8,495
	• Non-Management	Person	6,125	6,452	7,256	10,505
	Percentage of employees receiving regular performance reviews	%	100	100	100	100
	• Executive Management	%	100	100	100	100
	• Senior Management	%	100	100	100	100
	• Middle Management	%	100	100	100	100
	• Junior Management	%	100	100	100	100
	• Non-Management	%	100	100	100	100
	Total employees receiving career development reviews	Person	12,514	14,242	14,237	21,281
	• Executive Management	Person	88	94	101	109
	• Senior Management	Person	369	388	414	577
	• Middle Management	Person	1,409	1,485	1,619	2,341
	• Junior Management	Person	5,778	6,106	5,831	8,495
	• Non-Management	Person	4,870	6,169	6,272	9,759
	Percentage of employees receiving career development reviews	%	90.89	98.05	93.54	96.61
	• Executive Management	%	100	100	100	100
	• Senior Management	%	100	100	100	100
	• Middle Management	%	100	100	100	100
	• Junior Management	%	100	100	100	100
	• Non-Management	%	79.51	95.61	86.44	92.90
Remuneration ratio of women to men						
405-2	Strategic	Ratio	0.950	0.960	0.960	0.962
	Managerial	Ratio	0.931	0.944	0.945	0.947
	Supervisory and Operational	Ratio	0.912	0.929	0.930	0.931
Employee Engagement Score*						
(We decided to move the annual employee engagement process to every second year. Hence our 2019 results are the same as 2018.)						
	Employee engagement score	%	86.02	90.68	90.97	90.97
	- Male	%	82.62	93.20	93.28	93.28
	- Female	%	89.39	89.90	90.01	90.01
	Data coverage of employee engagement survey		93.50	93.75	93.43	93.43
	- Male	% of male employees	93.40	93.60	93.10	93.10
	- Female	% of female employees	93.31	93.98	93.78	93.78
Collective Bargaining						
102-41	Total employees covered by collective bargaining agreements	Person	6,948	7,748	7,810	11,337
	Percentage of total employees covered by collective bargaining agreements	%	48.14	50.99	51.31	51.47
	Number of consultations/negotiations with trade unions over organizational changes [unit]	Number	65	94	334	262

GRI Standards		Unit	2016	2017	2018	2019
Human Rights Integration						
412-2	Total number of hours of employees training on human rights policies or procedures concerning aspects of human rights that are relevant to operations	Hour	9,269	14,256	17,210	20,799
	Total number of employees trained in human rights policies or procedures concerning aspects of human rights that are relevant to operations	Person	7,997	11,403	12,819	19,362
	Percentage of employees trained in human rights policies or procedures concerning aspects of human rights that are relevant to operations	% of total employees	55.4	75.0	80.5	85.3
Non-discrimination						
406-1	Total number of incidents of discrimination and corrective actions taken	Case	2	4	0	0
	Number of incidents of discrimination and corrective actions taken regarding employees	Case	1	3	0	0
	Number of incidents of discrimination and corrective actions taken to all excluding employees	Case	1	1	0	0
Security Practices						
410-1	Total number of security personnel	Person	461	376	352	388
	Total number of security personnel trained in the organization's human rights policies or procedures that are relevant to operations [unit]	Person	405	332	305	345
	Percentage of security personnel trained in the organization's human rights policies or procedures that are relevant to operations [%]	%	87.85	88.30	86.65	88.92
Rights of Indigenous People						
411-1	Incidents of violations involving rights of indigenous people	Case	0	0	0	0
Human Rights Assessment						
412-1	Total number of operations	Number	69	83	91	108
	Total number of operations that have been subject to human rights reviews or impact assessments	Number	69	83	91	108
	Percentage of operations that have been subject to human rights reviews or impact assessments [unit]	%	100	100	100	100
Human Rights Grievances						
103-2	Total number of grievances concerning human rights through the formal grievance process	Case	0	0	0	0
	Number of grievances about human rights (related to employees) through the formal grievance process	Case	0	0	0	0
	Number of grievance about human rights (not related to employees) through the formal grievance process	Case	0	0	0	0
	Total number of human rights grievances addressed in this reporting period	Case	0	0	0	0
	Number of human rights grievances (related to employees) addressed during the reporting period	Case	0	0	0	0
	Number of human rights grievances (not related to employees) addressed during the reporting period	Case	0	0	0	0
	Total number of human rights grievances filed in the previous reporting period that were resolved during the reporting period	Case	0	0	0	0
	Number of human rights grievances (related to employees) filed in the previous reporting period that were resolved during the reporting period	Case	0	0	0	0
	Number of human rights grievances (not related to employees) filed in the previous reporting period that were resolved during the reporting period	Case	0	0	0	0
Labor Practice Grievances						
103-2	Total number of grievances about labor practices filed through the formal grievance mechanism	Case	41	26	27	24
	Total number of grievances about labor practices addressed during the reporting period	Case	44	16	25	18
	Total number of grievances about labor practices resolved during the reporting period	Case	32	19	18	18
	Total number of grievances about labor practices filed prior to the reporting period that were resolved during the reporting period	Case	24	15	21	22

* Does not include temporary manpower. Temporary manpower is contingent manpower hired through an agency. Appropriate compliance training on Human Rights, Health & Safety has always been given to temporary manpower.

Global CSR Data

GRI Standards		Unit	2016	2017	2018	2019
Local Community Engagement						
413-1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	%	73	89	67	88
	Total number of operations with any of the below local community engagement, impact assessments and developed programs (e.g. if site A has SIA and EIA, and site B has EIA the total number of sites with programs is 2)	Number	18	15	29	32
	Number of operation with implemented social impact assessment including gender assessment	Number	4	11	10	9
	Number of operation with implemented environmental impact assessment	Number	14	20	21	21
	Number of operation with implemented public disclosure of results of environmental and social impact assessment	Number	9	13	12	13
	Number of operation with implemented local community development programs	Number	10	17	18	18
	Number of operation with implemented stakeholder engagement plans	Number	9	14	13	12
	Number of operation with implemented broad base local community consultation committees and processes	Number	4	9	10	7
	Number of operation with implemented works councils, occupational health and safety committees and other employee representation bodies to deal with impacts	Number	12	20	21	23
	Number of operation with implemented formal local community grievance process	Number	6	12	3	7
Social Grievances						
	Number of grievances regarding society received through the formal grievance process	Number	4	1	1	0
	Total number of societal grievances addressed during this reporting period	Number	4	0	0	0
	Total number of societal grievances resolved during this reporting period	Number	4	0	0	0
	Total number of societal grievances resolved in the previous reporting period	Number	1	4	1	0
Total Philanthropic Activities						
	Total philanthropic activities	%	100	100	100	100
	Charitable donations	USD	131,135	888,367	970,856	350,980
	Community investments	USD	445,808	645,634	971,420	715,351
	Commercial initiatives in the community	USD	77,239	325,003	406,629	730,397
Philanthropic Contributions						
	Total cash contributions	USD	546,010	1,749,830	1,771,435	1,796,730
	Time: Estimated employee costs	USD	866,390	1,918,393	1,007,502	1,142,800
	Time: Employee volunteering during paid working hours	Hour	53,102	103,681	58,640	60,960
	Total in-kind giving	USD	79,923	93,160	122,914	153,140
	Total management overheads	USD	32,687	16,012	454,556	82,360



ABOUT THIS REPORT



About This Report

Our Approach

IVL has published its Sustainability Reports annually since 2010, as part of our commitment to communicating effectively and transparently, and providing a better understanding of our sustainable development efforts. This includes our Environmental, Social and Governance (ESG) initiatives, which allows us to strengthen our engagement with stakeholders by demonstrating how we are integrating sustainability into our operations. This report provides insights into our approach, along with our objectives, strategy and performance covering a broad range of issues pertaining to economic, environmental, social dimensions.

This report is based on the Global Reporting Initiative (GRI) standards. Our materiality analysis guided our reporting process, and the issues included in this report in particular. The key elements of the GRI standards for sustainability reporting that we have focused on, in keeping with the intent of the standards, are described below.

Since 2018, we also have applied the International Integrated Reporting Council (IIRC)'s Integrated Reporting Framework in developing our Sustainability Report. We are providing a holistic analysis of IVL's strategic vision, performance, governance, and value creation, while fostering a more in-depth understanding of the financial and non-financial key performance indicators that the company uses to manage its business over the short, medium, and long-term. Furthermore, our GRI Content Index is cross-referenced with the UN Sustainable Development Goals (SDGs).

Scope of the Report

We consolidated information from all of our countries and operations in preparation for this report, excluding the entities and other operations mentioned under 'Exceptions' below.

It covers our operations in 32 countries around the world. The report includes both our sustainability update and a comprehensive collection of sustainability disclosures and materials. All of the quantitative data included covers the January 1 to December 31, 2019 period, unless otherwise stated. We also provide some information about decisions and events that took place in early 2020 so that readers have more up-to-date information. As IVL is undergoing significant growth, we recognize the importance of ensuring progress on sustainability.

Our previous Sustainability Reports are available on our site from 2010-2018.

The scope and reporting boundaries cover our disclosures across IVL as a group, including subsidiaries and factories, except those mentioned under the "Exceptions" topic, within social, environmental and economic parameters, and are indicated in the GRI Content Index. The information on the companies acquired during the year and included in the report contains information from the acquisition date.

We report on consolidated data from entities (more than 50% ownership) and joint ventures where we have management control, but exclude all data from entities in which we participate, but where we have minority ownership, or no management control.

The environmental data is based on data sources from accounting, meter readings, data from production systems and estimation with ground rules.

Greenhouse Gas (GHG) Accounting

During the reporting year, GHG accounting was carried out systematically across all of our operations globally as per the Greenhouse Gas Protocol on Corporate Accounting and Reporting by the World Resources Institute (WRI)/World Business Council for Sustainable Development (WBCSD).

Reporting Principles

Report Content

We strongly believe that a broad and inclusive materiality process, including stakeholder engagement, can deliver valuable benefits to the entire organization. This includes:

- Prioritizing our resources for the sustainability issues that matter most to our business and stakeholders.
- Ensuring the right business strategy by taking into account significant social, environmental, and economic initiatives thereby focusing our time and resources on the most important material topics.
- Embedding sustainability issues into the day-to-day management and operations of our wider business processes.
- Identifying trends on the horizon and potential emerging risks, thereby enabling our business to be ready to quickly adapt and take advantage of opportunities to develop new products or services, and to stay ahead of our competitors.

Report Quality

Our Sustainability Report was prepared based on the GRI standards, Core option. The standards set out principles for defining reporting quality – Balance, Comparability, Accuracy, Timeliness, Clarity, and Reliability. We have taken a number of actions to meet the above reporting quality principles.

- We continue to improve on our quality of information and disclose it in a timely manner enabling our stakeholders to effectively integrate this into their decision-making.
- We value the opinions of our internal and external stakeholders, and incorporate their feedback in preparing this report.
- The information and feedback received from stakeholders through various channels has been compiled and analyzed, including key focus areas (i.e. material topics have been identified).

The GRI's standards on defining content are applied throughout the report. The process consists of the following three steps:

1. Sustainability Context:

This process involves the analysis and identification of sustainability-related materiality topics. Materiality topics of significance to our business strategy and operations occur in the economic, environmental and social areas of the business and are identified based on business opportunities, levels of risk and possible impacts to our long-term sustainable growth. This process also involves the evaluation of external trends relating to our business. Furthermore, stakeholders' points of view arising from our stakeholder engagement process are used as inputs to identify the issues they underlined as important.

2. Materiality Assessment:

By combining the significant topics that may affect us and our stakeholders, we are able to identify materiality topics. As part of the materiality assessment, we have conducted a survey covering both external stakeholders (suppliers, customers, investors, media, analysts and bankers) and internal stakeholders (across all operations, businesses, and key functions). Details of the materiality assessment are provided in the Materiality Assessment chapter in this report.

We also created a materiality matrix with key material topics, which were assessed by business leaders, plant heads, the Sustainability Steering Committee and people from various functions across the organization and our external stakeholders. Based on this assessment, senior management agreed on the material topics for our business going forward. We reviewed the GRI topics and where relevant, assigned indicators (please see the GRI content index).

Twelve material topics were identified. Details of the materiality matrix are given in the Materiality Assessment chapter in this report. In order to drive performance improvements, we established key performance indicators and targets directly related to our material topics.

3. Sustainability Report Assurance and GHG Verification:

External assurance of our sustainability disclosures is an integral part of our approach to provide accurate information and metrics for our stakeholders and the public and further enhances the transparency and completeness of the report.

Selected content and data disclosed in our Sustainability Report has been verified and assured by an independent external assurance auditor, TUV India Private Limited, in accordance with the Global Reporting Initiative Standards and AA1000AS. An Assurance Statement issued by TUV India is available in the Independent Assurance Statement section of this report. The assured data is indicated in the GRI Content Index.

The information on GHG Scope 1 and 2 emissions has been verified by an independent external assurance auditor, TUV Nord GmbH, in accordance with the GHG Protocol, ISO 14064-1, and ISO 14064-3.

The non-financial information included in the report is subject to certain uncertainties due to limitations inherent in the nature of measuring such data. For example, variances can result from the selection or measurement techniques used across the complete IVL system. However, we are committed to disclosing the most accurate information and metrics possible for our stakeholders and the public.

Methodology of the Data

Data Coverage

Data verification coverage was expanded this year to 94 operating sites, excluding the entities mentioned in the exceptions below, compared to 72 operating sites last year. Twelve indicators, as mentioned in the Assurance Statement, were selected for the assurance audit based on the issues that are most significant to the sustainability performance of the business, as well as the key risks identified by the entire group.

Unless otherwise stated, we report data for our operations on a 100% ownership basis (e.g. for an 80%-owned operation, we report 100% of the data). Data is reported using the metric system and in US dollars, unless otherwise stated. The information provided in this report is for the company as a whole.

Changes in size, structure, ownership and developments

The list of entities acquired, incorporated and other developments is available in the 2019 Annual Report on pages 90-99 and on our site under News & Events.

Exceptions

The 2019 Sustainability Report includes environmental, safety and human resources data from all entities, including joint ventures in which we hold a shareholding of 50 percent or more and have management control. However, environmental and safety information excludes the following:

- The information of the entities acquired or operations commenced on or after 1 July, 2019^A
- Joint ventures with a 50% or less shareholding and no management control^B
- Sales and corporate offices

Human resources information other than human rights and employee engagement excludes the joint ventures with a 50% or less shareholding and no management control.

A: Entities acquired or operations commenced on or after 1 July, 2019:

- Bevpak (Nigeria) Limited
- Sinterama Bulgaria
- Sinterama Asia
- Sinterama S.p.A (Sandigliano and Saluzzo)
- Sinterama do Brazil
- Indorama Ventures Sustainable Solutions Fontana Inc.

B: Joint ventures with a 50% or less shareholding and/or no management control

- ES FiberVisions (Suzhou) Co., Ltd., China
- ES FiberVisions (Thailand) Co., Ltd., Thailand
- Shenma-PHP (Pingdingshan) Air Bag Yarn Manufacturing Co., Ltd., China
- Indorama Ventures EcoMex S. de R.L. de C.V., Mexico
- Corpus Christi Polymers LLC, the United States
- Huvis Global Corporation, the United States

Forward-Looking Statements

This Sustainability Report contains statements reflecting our views about our future performance that constitute “forward-looking statements”. Forward-looking statements are generally identified through the inclusion of words such as “aim”, “believe”, “estimate”, “expect”, “goal”, “intend”, “may”, “plan”, “target” and “will” or similar statements or variations of such terms and other similar expressions. Forward-looking statements inherently involve risks and uncertainties that could cause actual results to differ materially from those predicted in such statements, including changes in demand for our products, changes in the legal and regulatory environment, imposition by any jurisdiction (within or outside of Thailand) of new or increased taxes or other measures that impact our products and the timing thereof, our ability to compete effectively, our ability to achieve our goals with respect to sustainability, unfavorable economic conditions in the countries in which we operate and other factors discussed in our public securities filings. Investors are cautioned not to place undue reliance on any such forward-looking statements, which speak only as of the date they are made. IVL undertakes no obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise.



FiberVisions Products, Inc., USA

CERTIFICATE

ISO 14064-3 – Specification with guidance for the validation and verification of greenhouse gas assertions

With application of the above mentioned standard the carbon footprint was examined by TÜV NORD CERT GmbH regarding its correctness and completeness for

Indorama Ventures Public Company Ltd.
75/102, Ocean Tower 2
28th Floor, Sukhumvit Soi 19
Bangkok 10110
Thailand



TÜV NORD CERT GmbH, acting as an independent Certification Body, can confirm, to a Reasonable Level of Assurance, that the carbon footprint of Indorama Ventures Public Company Limited to be:

Emissions Source	Amount (tCO ₂ e)
Scope 1	4,744,746
Scope 2 (Location Based)	2,344,695
Scope 3 (Raw Materials)	21,502,996
Scope 3 (Electricity)	314,666
Scope 3 (Fuel)	723,463
Overall	29,630,566
Scope 2 (Market Based)	2,244,308

for the reporting period 01/01/2019–31/12/2019 (inclusive).

The company boundary encompasses all 94 operating sites globally including the wholly owned operations and subsidiaries of Indorama Ventures Public Company Limited. The emissions sources included are stationary fuel combustion, stationary fuel combustion- boiler, mobile fuel combustion, process off gas- PET, PTA, Nitrogen Production, waste water treatment (anaerobic and aerobic), refrigerant, fire suppression equipment, electrical equipment SF6, grid electricity, third party electricity, third party heat, steam, compressed air, chilled water, cooling water, biogas and biomass combustion, raw material consumption, Well to tank and transmission and distribution for purchased electricity, Well to tank for fuels. The calculations have been carried out according to ISO14064-1.

Certificate Registration No. 44 776 180191

Valid for the year: 2019

Audit Report No. 3527 4741

Certification Body
at TÜV NORD CERT GmbH

Essen, 2020-07-27

TÜV NORD CERT GmbH

Langemarckstraße 20

45141 Essen

www.tuev-nord-cert.de

Independent Assurance Statement

Introduction and Engagement

Indorama Ventures Public Company Limited (hereafter "IVL") commissioned TUV India Private Limited (TUVI) to conduct the independent external assurance of IVL's sustainability report (hereinafter "the Report"). This engagement comprises a **"limited assurance" of IVL's sustainability information and a "reasonable assurance" of IVL's direct and indirect (Scope 1 and 2) GHG emissions** as a whole for the applied reporting period. This assurance engagement was conducted against the Global Reporting Initiative (GRI) Standards and AA1000AS (2008) Protocol (Type 1, Moderate Level) for verification of the Report. Since COVID-19 prevented onsite verification, remote verification (via Skype, web-based video conference calls and telephone calls) was conducted in March 2020 for plants located in the Netherlands, Poland and Germany (*namely, Indorama Ventures Europe B.V. (Rotterdam: March 9-11, 2020), Indorama Ventures Poland Sp. z o.o. (Wrocław: March 12, 13 and 16, 2020) and Trevira GmbH (Bobingen: March 18-20, 2020) respectively*). This was done together with a desk review which was carried out for all other IVL sites within the reporting boundary. The Report covers IVL's sustainability information for the January 1, 2019 to December 31, 2019 period.

Scope, Boundary and Limitations of Assurance

The Report was prepared in accordance with the GRI Standards: Core option. The scope of the assurance includes the environmental and social disclosures given in the Report. In particular, the assurance engagement included the following:

- Verification of the application of the Report content, principles as mentioned in the GRI Standards, and the quality of the information presented in the Report over the reporting period;
- Review of the policies, initiatives, practices and performance described in the Report;
- Review of the disclosures made in the Report against the requirements of the GRI Standards and AA1000AS (2008) with the agreed level of assurance;
- Verification of the reliability of the GRI Standards Disclosure (as identified in the materiality assessment);
- Specified information was selected based on the "Materiality Assessment" and needs in order to be meaningful to the intended users;
- Confirmation of the fulfilment of the GRI Standards; "in accordance" with the Core criteria, as declared by the management of IVL.

The reporting boundary is based on the internal and external materiality assessment. The reporting topic boundaries are set out in the Report covering the above-mentioned sustainability performance of IVL Group.

Our engagement did not include an assessment of the adequacy or the effectiveness of IVL's strategy or management of sustainability-related issues. During the assurance process, TUVI did not come across limitations to the scope of the agreed assurance engagement. No external stakeholders were interviewed as a part of the sustainability engagement for the applied reporting period.

Verification Methodology

The Report was evaluated against the following criteria:

- Adherence to the principles of Stakeholder Inclusiveness, Materiality, Responsiveness, Completeness, Neutrality, Relevance, Sustainability Context, Accuracy, Reliability, Comparability, Clarity, and Timeliness; as prescribed in the GRI Standards and AA1000AS (2008);

- Application of the principles and requirements of the GRI Standards in accordance with the Core criteria.

During the assurance engagement, TUVI adopted a risk-based approach, concentrating on verification efforts on issues of high material relevance to IVL's business and its stakeholders. TUVI has verified the statements and claims made in the Report, and assessed the robustness of the underlying data management system, information flow, and controls. In doing so:

- TUVI reviewed the approach adopted by IVL for the stakeholder engagement and materiality assessment process. TUVI performed limited internal stakeholder engagement to verify the qualitative statements made in the Report;
- TUVI verified the sustainability-related statements and claims made in the Report and assessed the robustness of the data management system, information flow, and controls;
- TUVI examined and reviewed the documents, data and other information made available by IVL for the reported disclosures including the Management Approach and performance disclosure;
- TUVI conducted interviews with key representatives including data owners and decision-makers with different functions at IVL during the remote verification;
- TUVI performed sample-based reviews of the mechanisms for implementing sustainability-related policies, as described in IVL's Report;
- TUVI verified sample-based checks of the processes for generating, gathering and managing the quantitative data and qualitative information included in the Report for the reporting period.

Opportunities for Improvement

The following is an extract from the observations and opportunities for improvement reported to the management of IVL and which was considered in drawing our conclusions on the Report. They are generally consistent with the management's objectives.

The opportunities are as follows:

- IVL can assess its emission targets following the "Science-Based Targets" methodology (Sectoral de-carbonization approach, or Absolute-based targets, or Economic approach);
- Further training on Process Safety (API RP 754), Functional Safety (ISO 26262) should be imparted at the plant level;
- IVL may induct the parameter "% diversion of waste from landfill" as one of the reporting indicators. IVL should survey all of its sites and as applicable, make provisions to monitor internal (in-house) reuse, recycle recovery, composting and incineration projects. The outcomes, "if significant," can be described in the Report.

Conclusions

The Report has been prepared in accordance with the GRI Standards: Core option. In our opinion, based on the scope of this assurance engagement, the disclosures on sustainability performance reported in the Report along with the referenced information provides a fair representation of the material topics, related strategies, and performance disclosure, and meets the general content and quality requirements of the GRI Standards – Core option.

Universal Standards: IVL followed GRI 101: Reporting Principles to define the report's content and quality. GRI 102: General Disclosures were followed when reporting information about an organization's profile, strategy, ethics and integrity, governance, stakeholder engagement practices, and reporting process. Furthermore, GRI 103 was selected for Management's Approach on reporting information about how an organization manages a material topic. TUVI is of the opinion that the reported disclosures generally meet the GRI Standards reporting requirements in accordance with the "Core" option.

Topic-specific Standards 300 series (Environmental topics) and 400 series (Social topics): These Topic-specific Standards were used to report information on an organization's impacts related to environmental and social topics. TUVI is of the opinion that the reported material topics and Topic-specific Standards that IVL used to prepare its Report are appropriately identified and addressed.

The material topics are noted below:

- Disclosure 302-1: Energy consumption within the organization
- Disclosure 302-3: Energy intensity
- Disclosure 303-1: Water withdrawal by source
- Disclosure 303-3: Water recycled and reused
- Disclosure 305-1: Direct (Scope 1) GHG emissions
- Disclosure 305-2: Energy indirect (Scope 2) GHG emissions
- Disclosure 305-7: Nitrogen oxides (NOx)/sulfide oxides (SOx) and other significant air emissions
- Disclosure 306-1: Water discharge by quality and destination
- Disclosure 306-2: Waste by type and disposal method
- Disclosure 306-3: Significant spills
- Disclosure 403-2: Types of injury and rates of injury, occupational diseases, lost days, absenteeism, and the number of work-related fatalities
- Disclosure 404-1: Average hours of training per year per employee
- Process Safety Events (Tier 1 and 2): As per the American Petroleum Industry's recommended Practice API RP 754

Limited Assurance Conclusion: Based on the procedures we have performed, nothing has come to our attention that causes us to believe that the information subject to the limited assurance engagement was not prepared, in all material respects. TUVI found the sustainability information to be reliable in all material respects, with regards to the reporting criteria ("Core") of the GRI Standards.

Reasonable Assurance Conclusion: TUV Nord Cert GmbH has verified the information on GHG Scope 1 and 2 emissions in accordance with the GHG Protocol, ISO 14064-1, and ISO 14064-3. Based on the procedures we have performed, in our opinion, IVL reported the direct and indirect (Scope 1 and 2) GHG emissions as a whole.

TUVI did not perform any assurance of procedures on any prospective information, such as targets, expectations, and ambitions disclosed in the sustainability information. Consequently, TUVI draws no conclusion on the prospective information. This assurance statement has been prepared in accordance with the terms of our engagement. The limited level assurance engagement with respect to sustainability-related data involves performing procedures to obtain evidence about the sustainability information. The procedures performed depend on the practitioner's judgment, but their nature is different from, and their extent is less than, a reasonable level assurance engagement. It does not include detailed testing of source data or the operating effectiveness of processes, internal controls and consequently, they do not enable us to obtain the assurance necessary to become aware of all significant matters that might be identified in a reasonable level assurance engagement.

TUVI has evaluated the Report's adherence to the following principles with respect to the requirements of the GRI Standards.

Stakeholder Inclusiveness: Stakeholder identification and engagement has been carried out by IVL on a periodic basis to bring out key stakeholder concerns as material topics of significant stakeholders. In our view, the Report meets the requirements.

Sustainability Context: IVL established the relationship between sustainability and organizational strategy within the Report, as well as the context in which disclosures are made. In our view, the Report meets the requirements with regards to the Sustainability Context.

Materiality: The materiality assessment process has been carried out, based on the requirements of the GRI Standards, considering topics that are internal and external to the Company's range of businesses. The Report fairly brings out the aspects and topics, and its respective boundaries of the diverse operations of IVL. In our view, the Report meets the requirements.

Responsiveness: TUVI believes that the responses to the material topics are fairly articulated in the Report, i.e. disclosures on IVL's policies and management systems, including governance. In our view, the Report meets the requirements.

Completeness: The Report has fairly disclosed the General and Specific Standards Disclosures, including the Disclosure on Management Approach, covering the sustainability strategy, management approach, monitoring systems, and sustainability performance disclosure against the GRI Standards, in accordance with the "Core" option. In our view, the Report meets the requirements.

Reporting Principles for defining report quality: The majority of the data and information was verified by TUVI's assurance team during the remote assessment and found to be fairly accurate. Some inaccuracies in the data identified during the verification process were found to be attributable to transcription, interpretation and aggregation errors and these errors have been corrected. Therefore, in accordance with the GRI Standards and agreed level assurance engagement, TUVI concludes that the sustainability data and information presented in the Report is fairly reliable and acceptable. In our view, the Report meets the requirements. The disclosures related to sustainability issues and performances are reported in a balanced manner and are clear in terms of content and presentation. In our view, the Report meets the requirements.

Reliability: The majority of the data and information was verified by TUVI's assurance team and found to be fairly accurate. Some inaccuracies in the data identified during the verification process were found to be attributable to transcription, interpretation and aggregation errors and these errors have been corrected. Therefore, in accordance with the GRI Standards and limited level assurance engagement, TUVI concludes that the sustainability data and information presented in the Report is fairly reliable and acceptable. In our view, the Report meets the requirements.

Neutrality: The disclosures related to sustainability issues and performance are reported in a neutral tone, in terms of content and presentation. In our view, the Report meets the requirements.

TUVI expressly disclaims any liability or co-responsibility for any decision a person or entity would make based on this Assurance Statement. The intended users of this assurance statement are the management of IVL. The management of the Company is responsible for the information provided in the Report as well as the process of collecting, analyzing and reporting the information presented in the web-based and printed Reports, including its integrity and website maintenance. TUVI's responsibility regarding this verification is in accordance with the agreed scope of work which includes non-financial quantitative and qualitative information (Sustainability Performance – environmental and social disclosures) disclosed by IVL in the Report. This assurance engagement is based on the assumption that the data and the information provided to TUVI are complete and true.

TUVI's Competence and Independence

TUVI is an independent, neutral, third party providing sustainability services, with qualified environmental and social assurance specialists. TUVI states its independence and impartiality with regard to this assurance engagement. In the reporting year, TUVI did not work with IVL on any engagement that could compromise the independence or impartiality of our findings, conclusions, and recommendations. TUVI was not involved in the preparation of any content or data included in the Report, with the exception of this Assurance Statement. TUVI maintains complete impartiality towards any individuals interviewed during the assurance engagement.

For and on behalf of TUV India Private Limited



Swapnil Thanekar
Lead Verifier
Sustainability Assurance Practitioner
TUV India Private Limited



Manojkumar Borekar
Project Manager and Reviewer
Head – Sustainability Assurance Service
TUV India Private Limited



AA1000
Licensed Assurance Provider
000-138

Date: 25/03/2020
Place: Mumbai, India
Project Reference No: 8117625300

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GRI Standards Content Index for “The Core Option”

GRI Standard Disclosures	Disclosure Title	Page Number (Annual Report: AR / Sustainability Report: SR)	External Assurance
Organizational Profile			
102-1	Name of the organization	AR p. 38 / SR p. 123-124 / IVL website	-
102-2	Activities, brands, products, and services	AR p. 39-56 / SR p. 3, 12-13 / IVL website	-
102-3	Location of headquarters	AR p. 38 / SR p. 124 / IVL website	-
102-4	Locations of operations	AR p. 39 / SR p. 3, 12-13 / IVL website	-
102-5	Ownership and legal form	AR p. 38 / SR p. 110-114	-
102-6	Market served	AR p. 39 / SR p. 12-13 / IVL website	-
102-7	Scale of the organization	SR p. 12, 15-16 / IVL website	-
102-8	Information on employees and other workers	SR p. 15-16, / IVL website	-
102-9	Supply chain	SR p. 12 / IVL website	-
102-10	Significant changes to the organization and its supply chain	AR p. 90-99 / SR p. 110-114	-
102-11	Precautionary principle or approach	SR p. 110-114	-
102-12	External initiatives	AR p. 177-179 / SR p. 63, 68-69, 90-95 / IVL website	-
102-13	Membership of associations	SR p. 21, 63 / IVL website	-
Strategy			
102-14	Statement from senior decision-maker	AR p. 13-14, 17-20 / SR p. 6-9, 10-11 / IVL website	-
102-15	Key impacts, risks and opportunities	AR p. 128-138 / SR p. 27, 34-37 / IVL website	-
Ethics and Integrity			
102-16	Values, principles, standards, and norms of behavior	AR p. 1 / SR p. 15, 22-25 / IVL website	-
102-17	Mechanisms for advice and concerns about ethics	AR p.154-155 / SR p. 31-33 / IVL website	-
Governance			
102-18	Governance structure	AR p. 36, 79, 158 / SR p. 23, 30 / IVL website	-
102-19	Delegating authority	AR p. 79-81 / SR p. 23	-
102-20	Executive-level responsibility for economic, environmental, and social topics	AR p. 79 / SR p. 23 / IVL website	-
102-21	Consulting stakeholders on economic, environmental, and social topics	AR p. 152-154 / SR p. 26-27 / IVL website	-
102-22	Composition of the highest governance body and its committees	AR p. 79-81 / SR p. 23, 30 / IVL website	-
102-23	Chair of the highest governance body	AR p. 63 / SR p. 6-9, 23, 30 / IVL website	-
102-24	Nominating and selecting the highest governance body	AR p. 155, 185 / SR p. 6-9, 23, 30 / IVL website	-
102-26	Role of highest governance body in setting purpose, values and strategy	AR p. 146, 157-158 / SR p. 23, 30 / IVL website	-
102-27	Collective knowledge of highest governance body	AR p. 63-78, 183 / SR p. 8, 30 / IVL website	-
102-28	Evaluating the highest governance body's performance	AR p. 159-160 / SR p. 30 / IVL website	-
102-29	Identifying and managing economic, environmental, and social impacts	AR. p. 128-138 / SR p. 26-27 / IVL website	-
102-30	Effectiveness of risk management processes	AR p. 128 - 138 / SR p. 34-37 / IVL website	-
102-31	Review of economic, environmental, and social topics	SR p. 29-109 / IVL website	-
102-32	Highest Governance body's role in sustainability reporting	SR p. 23 / IVL website	-
Stakeholder Engagement			
102-40	List of stakeholder groups	AR p. 152-154 / SR p. 26 / IVL website	-
102-41	Collective Bargain	SR p. 77, 107 / IVL website	-
102-42	Identifying and selecting stakeholders	SR p. 26 / IVL website	-
102-43	Approach to stakeholder engagement	AR p. 152-154 / SR p. 26 / IVL website	-
102-44	Key topics and concerned raised	AR p. 174-176 / SR p. 27 / IVL website	-
Reporting Practices			
102-45	Entities included in the consolidated financial statements	AR p. 39-56, 193	-
102-46	Defining report content and topic boundaries	SR p. 110-114 / IVL website	-
102-47	List of material topics	AR p. 174 / SR p. 27 / IVL website	-
102-48	Restatements of information	SR p. 110-114	-
102-49	Changes on reporting	SR p. 110-114	-
102-50	Reporting period	SR p. 110-114	-
102-51	Date of most recent report	SR p. 110-114	-
102-52	Reporting cycle	SR p. 110-114	-
102-53	Contact point for questions regarding the report	SR p. 123-124 / IVL website	-
102-54	Claims of reporting in accordance with the GRI Standards	SR p. 110, 120-122	-
102-55	GRI content index	SR p. 120-122	-
102-56	External assurance	SR p. 115-119	-
Management Approach			
103-1	Explanation of the material topic and its boundary	SR p. 27, 29-109, 110-114 / IVL website	-
103-2	The management approach and its components	SR p. 29-109 / IVL website	-
103-3	Evaluation of the management approach	SR p. 29-109 / IVL website	-

GRI Standard Disclosures	Disclosure Title	Page Number (Annual Report: AR / Sustainability Report: SR)	External Assurance
Economic Performance			
201-1	Direct economic value generated and distributed	AR p. 5-10, 101-102, 193 / SR p. 16 / IVL website	-
201-2	Financial Implications and other risks and opportunities due to climate change	AR p. 132-133, 176 / SR p.37, 49-54 / IVL website	-
Market Presence			
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	SR p. 83, 107	-
Anti-Corruption			
205-1	Operations assessed for risks related to corruption	AR p. 154-155 / SR p. 27, 31-33 / IVL website	-
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2025 GLOBAL COMMITMENT

- Recycle **750,000 tons** of post-consumer PET materials as feedstock into our polyester production **per year**
- Recycle **50 billion bottles per year**
- Invest **USD 1.5 billion**



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