

We Source – We Make – We Recycle

Our Journey to a Circular Economy



Our Vision

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



Indorama Ventures is a leading chemical company and a globally integrated leader in recyclable PET and fibers serving major customers in diverse end-use markets.

Following our core strategies, we develop innovative products meeting the needs of our customers and make great products for society.

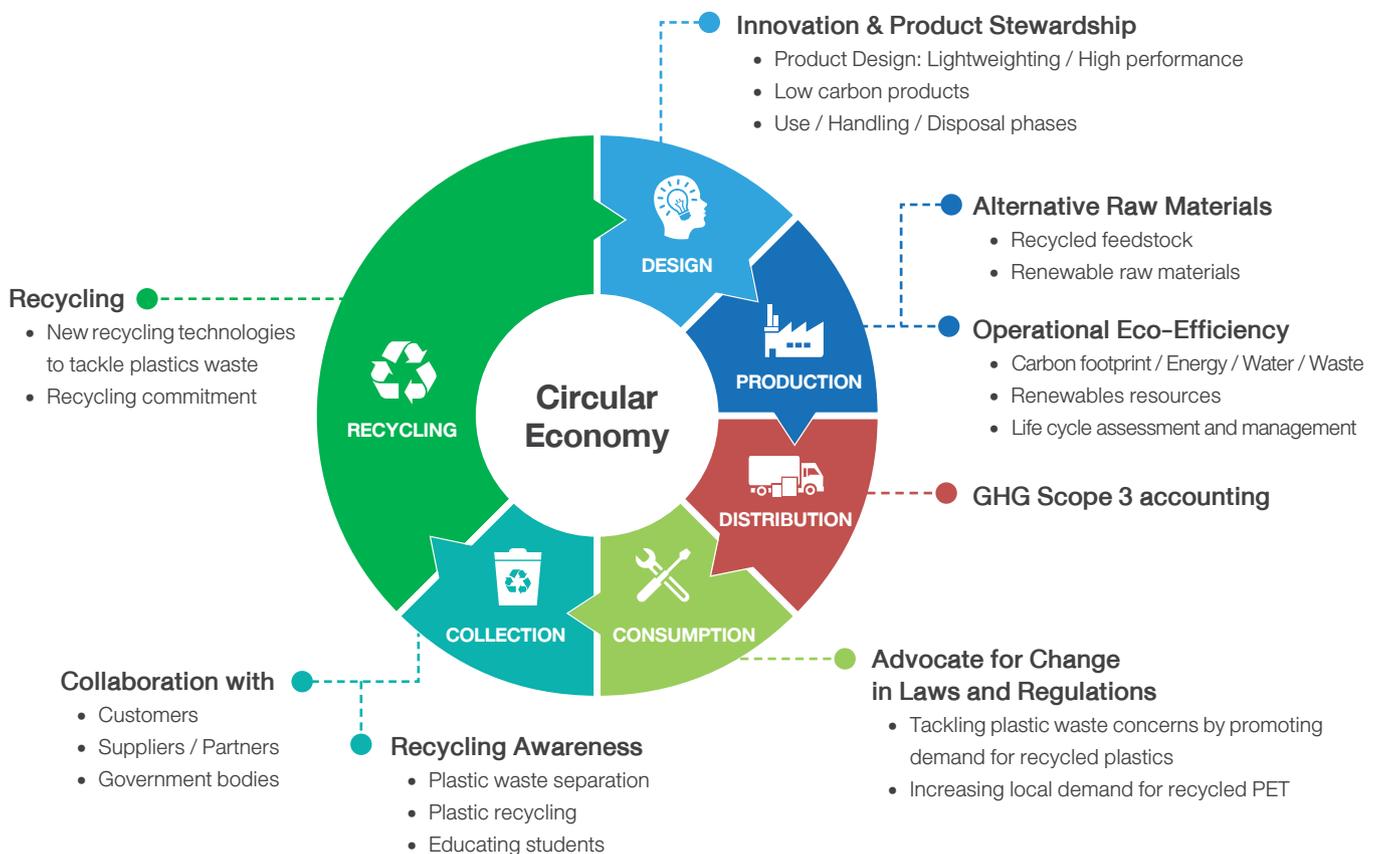
Our Recycling Business

As the world's largest producer of PET, we established a recycling business to respond to the challenges of resource management as well as the need for sustainable packaging from our world-class customers.

We have the opportunity to play a leading role by bringing customers of recycled products into the product value chain and developing ways to include recyclability into all of our products. This is a very important priority for us and is included in our climate change strategy.



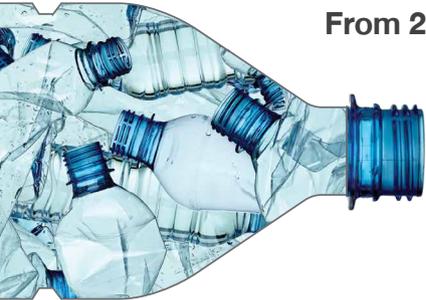
IVL Recycling Strategies Enhances our capability to drive closed loop solutions



We are the
**leading
PET Recycler**
in Asia, Europe
and North America.

Our Recycling Global commitment :

To incorporate **750,000** tons of post-consumer PET materials as feedstock into our polyester production by 2025



From 2011 – 2018

Recycled around
38 BILLION
PET bottles

Avoided
840,000 tons of
plastic waste
to landfill

Reduced
over 1.25 million
tons of carbon
footprint in their
life cycle

Decreased
Water consumption and
Energy consumption

Our Aim is to Complete the Recyclable Loop



We acquired Sorepla Industries S.A. in France. The facility consists of three production lines: Recycled Polyethylene Terephthalate (rPET), Recycled High Density Polyethylene (rHDPE) and food-grade pellets. Additionally, Indorama Polyester Industries in Nakhon Pathom, Thailand, has built a new facility to recycle HDPE, plastic used for bottle closures. We also acquired Custom Polymers, a recycling facility in US in early 2019 to further enhance our global recycling capacity.

Through the joint venture with Loop Industries, we expect 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.

Pioneering Innovation

Our most recent collaboration is truly pioneering and will allow the conversion of all post-consumer PET waste back into virgin PET and subsequently into high-quality food grade PET. This technology is expected to break through the limitations of recycling colored PET, which has been problematic for the industry for a long time. We are working closely with our partners to build state-of-the-art technology that contributes to tackling the global issue of waste and which enables us to go beyond the role of a polymer manufacturer.



Indorama Ventures announces the launch of **DEJA™**, a 100% rPET brand which is available in various forms such as recycled flakes, pellets, fibers and filaments for use in multiple applications.

Bringing Community Together

Recycling education is an important focus for IVL. We are actively building and increasing public awareness and changes in behavior about waste disposal, waste management, the importance of recycling and the products that can be produced from recycling of PET bottles.

- 15 Schools / 5,032 Students / 10 Organizations
- More than 2,000 Kg of PET bottles
- Over 2,500 shirts produced from recycled bottles given to society



KEY ACHIEVEMENTS 2018

MEMBER OF

Dow Jones Sustainability Indices

In Collaboration with RobecoSAM

- Member of 2018 DJSI Emerging Markets Chemicals Industry
- Ranked among the top ten of all global chemical companies



FTSE4Good

- A constituent of the FTSE4Good Index Series Best ESG Score in the 100% percentile of the group in 2018



- 2018 Climate Change Rating: B
- 2018 Supply Chain Rating: B-



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



2018
ESG Disclosures



Bloomberg

Best ESG Disclosure Score
in 2018



2018
ESG Disclosures

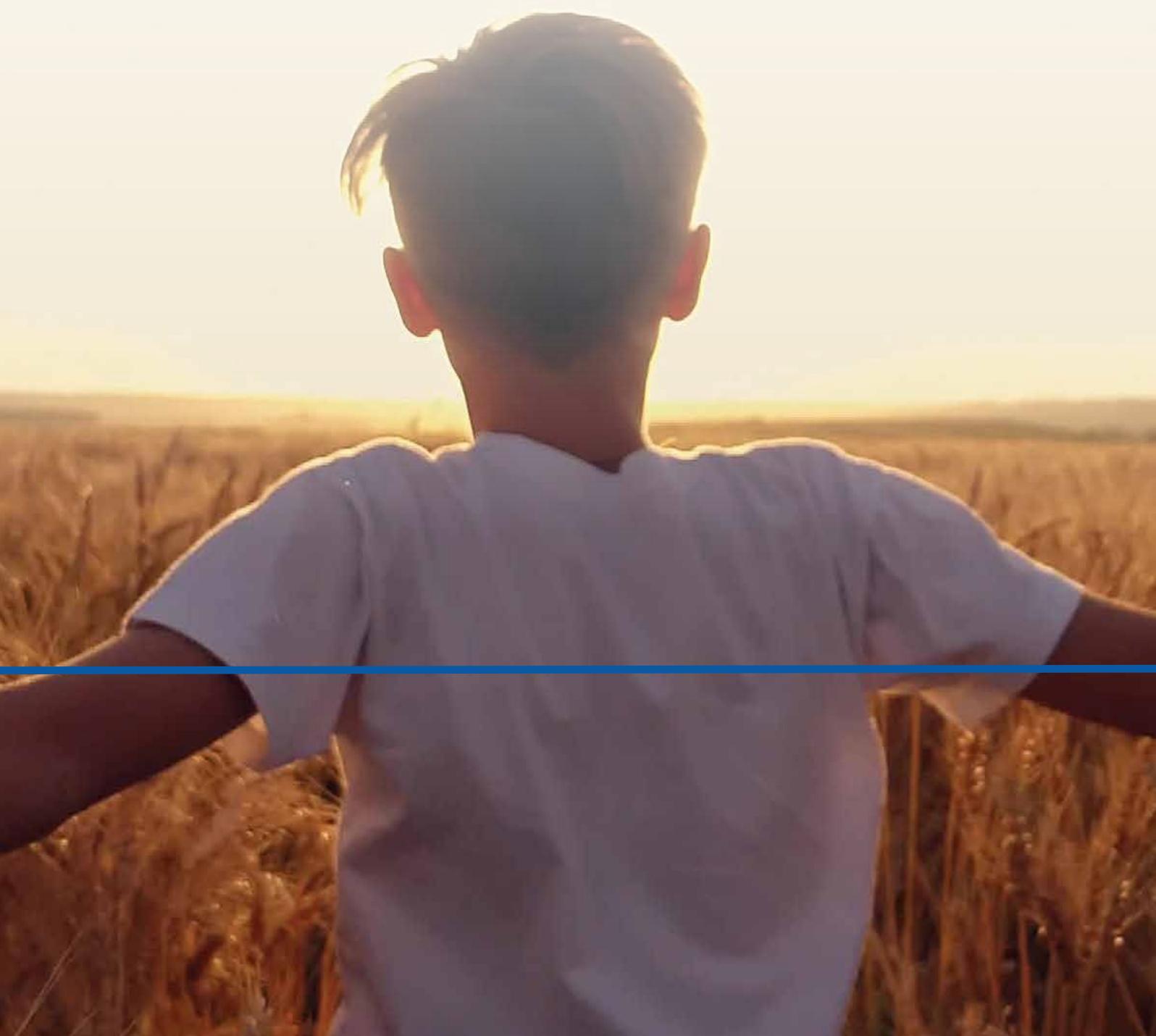


The Stock Exchange of Thailand

- SET Sustainability Awards 2018 Outstanding
- Thailand Sustainability Investment 2018

CONTENTS

Group CEO Message	06	Our Material Topics	20
Business Overview	10	About This Report	80
IVL's Sustainable Value Creation for Stakeholders	12	Independent Assurance Statement	84
Sustainability at Indorama Ventures	16	GRI Index	89
Materiality Assessment	18	Key Contacts and Feedback	92



Group CEO Message

*“Next economic revolution is underway, and this fundamental shift revolves around **Sustainability**.”*

Sustainability is not only a social or environmental issue, but **an idea** that will increasingly **transform our economies** and the companies that embrace them.

I am pleased to report that 2018 was a year of continued success across all major financial and operational metrics. We remain consistent in delivering on our strategy to achieve responsible, sustainable and profitable growth. We are strengthening our long-lasting competitive advantages through a diversified portfolio of businesses, integration and global scale including expanding our recycling and high value-added propositions. During the year, we made 12 acquisitions that position us for continued growth, enlarge our



geographic footprint and increase our position as a leading recycler in Asia, Europe and North America. We also entered into two agreements that will potentially leverage chemical recycling technology.

All of this underpins our transformative growth through our “win and scale up” model, M&A, and operational excellence. This is further supported by our responsible approach to building a sustainable business, our people and culture, risk management, and governance, which allows us to create value for society and our stakeholders.

Solid Financial Performance

In 2018, IVL achieved record revenue and earnings with structural improvements, an enhanced portfolio, and a new investment strategy.

- Total revenue of USD10.741 billion, increasing 27% YoY.
- Core EBITDA of USD1.4 billion, increasing 44% YoY. Core EBITDA margin increased to 13%.
- Profit after tax and NCI of USD819 million, up 33% YoY.
- Operating Cash Flow of USD989, up 16% YoY.
- TRIS Rating (an S&P partner) upgraded IVL to AA- from its previous rating of A+.

Leading the way in Sustainability

Sustainability has been an integral element of success for IVL. We recognize that we have to demonstrate our willingness to develop and deliver on a sustainable strategy as moving towards a sustainable economy creates many opportunities.

IVL undertook several initiatives in 2018 that are in-line with our commitment to increase our focus on the long-term sustainability of the Company through recycling, lowering our carbon footprint, increasing use of renewable energy, and developing human capital.

Recycling

We continue to support the circular economy having committed to further increasing our use of post-consumer polyethylene terephthalate (PET) and polyester waste materials as feedstock for the future. Recycling is an important and growing part of IVL’s business.

We acquired Sorepla, a leading mechanical recycler in France, and Customs Polymers in the US to supplement our commitment to recycling. Furthermore, we collaborated with two start-ups, Ioniqa and Loop Industries, to develop chemical recycling and to help both commercialize their technologies.

In addition to our investments in 2018, we intend to increase our investments in the recycling business going forward to strengthen our position as a sustainability leader and aligning with our customers’ commitment. We believe that improving the ecological footprint of our industry and supporting our partners in the value chain will enhance the acceptability and use of recyclable PET.

Human Capital

IVL’s foundation is built on the strong leadership qualities of our employees. We have grown from 6,000 individuals in 2010 to over 18,000 today. I believe that our people drive our every success. In a reflection of our endeavors, we are spending twice the time we did in the past on talent development while building a performance-driven culture.

Renewable Energy

We now have three subsidiaries using 100 percent renewable energy with an overall increase in renewable energy by 6.9% from the previous year.

Employee Health and Safety

We have integrated health and safety into our business management processes and undertaken several initiatives over the years to ensure a healthy and safe work environment throughout our operations.

Environmental Management

Our continued focus on operational excellence resulted in a reduction of our carbon footprint to 0.522 tCO₂e/ton of production in 2018 from 0.553 tCO₂e/ton of production in 2017.





The road ahead, 2019 and beyond

Creating more potential and better value

We enter into 2019 from a position of strength, and remain committed to building on this growth momentum. Our initiatives make us more competitive, more agile in this fast-paced world, and more unified in our purpose. We will continue to develop our existing markets and enter new ones.

Working in partnership

As part of our recycling efforts, we have made a global commitment to incorporate 750,000 tons of post-consumer PET materials as feedstock into our polyester production by 2025. Having been associated with the Ellen MacArthur Foundation from very early on, IVL is involved in the New Plastics Economy Global Commitment in collaboration with the United Nations Environment Program towards a vision of a circular economy for sustainable plastics.

Promoting stronger standards

The life-cycle benefit of PET is well established, and improved waste collection rates will mean an increase in recycling rates throughout the world. The entire supply chain is working with regulators, and together, they expect to dramatically improve PET bottle collection and increase the content in their packaging needs. We continue to advocate for a shift in the mind-set of consumers around the world, to discourage the irresponsible use of plastics and to encourage the need to recycle.

Building on our achievements

We were successful this year because of the focus, dedication and great work of our global team on sustainability, demonstrating that it remains essential to who we are and what we do as a company. In 2018, IVL was included in Dow Jones Sustainability Index, which serves as an important acknowledgement of our deep corporate commitment to sustainability on a global level, together with the highly valued work our team is performing worldwide. We are equally proud of recognitions by EcoVadis, CDP, Sustainalytics, MSCI, Bloomberg's ESG Disclosure and FTSE4Good.

On behalf of the Board and management team, I would like to express my heartfelt thanks to everyone at IVL for their hard work and dedication in fulfilling the sustainability needs of our customers and the communities in which we live and work.

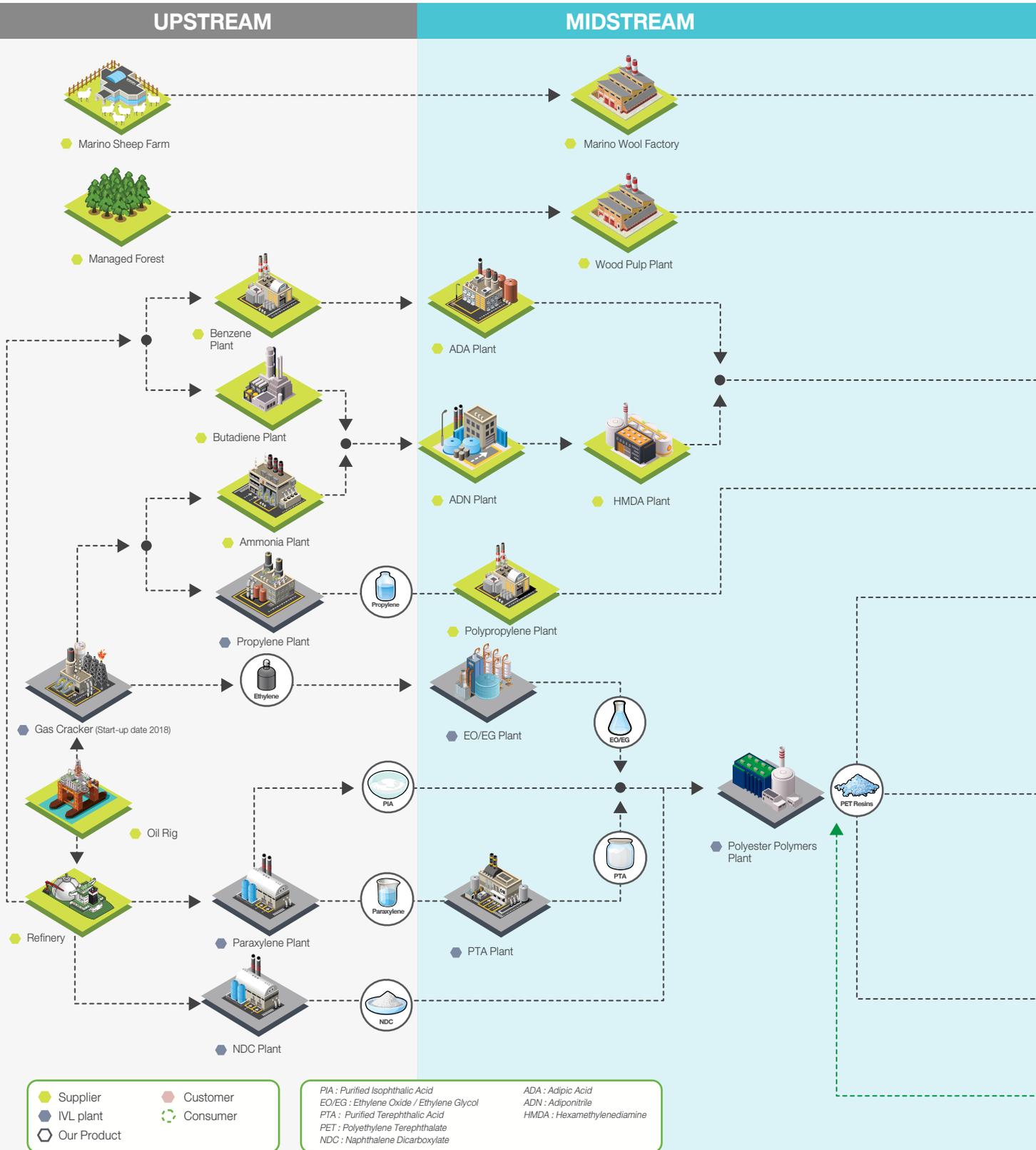
I also would like to thank all of our stakeholders including shareholders, business partners and associates who have provided us with their full support in allowing us to achieve continued success.

Aloke Lohia

Group Chief Executive Officer

Business Overview and Value Chain

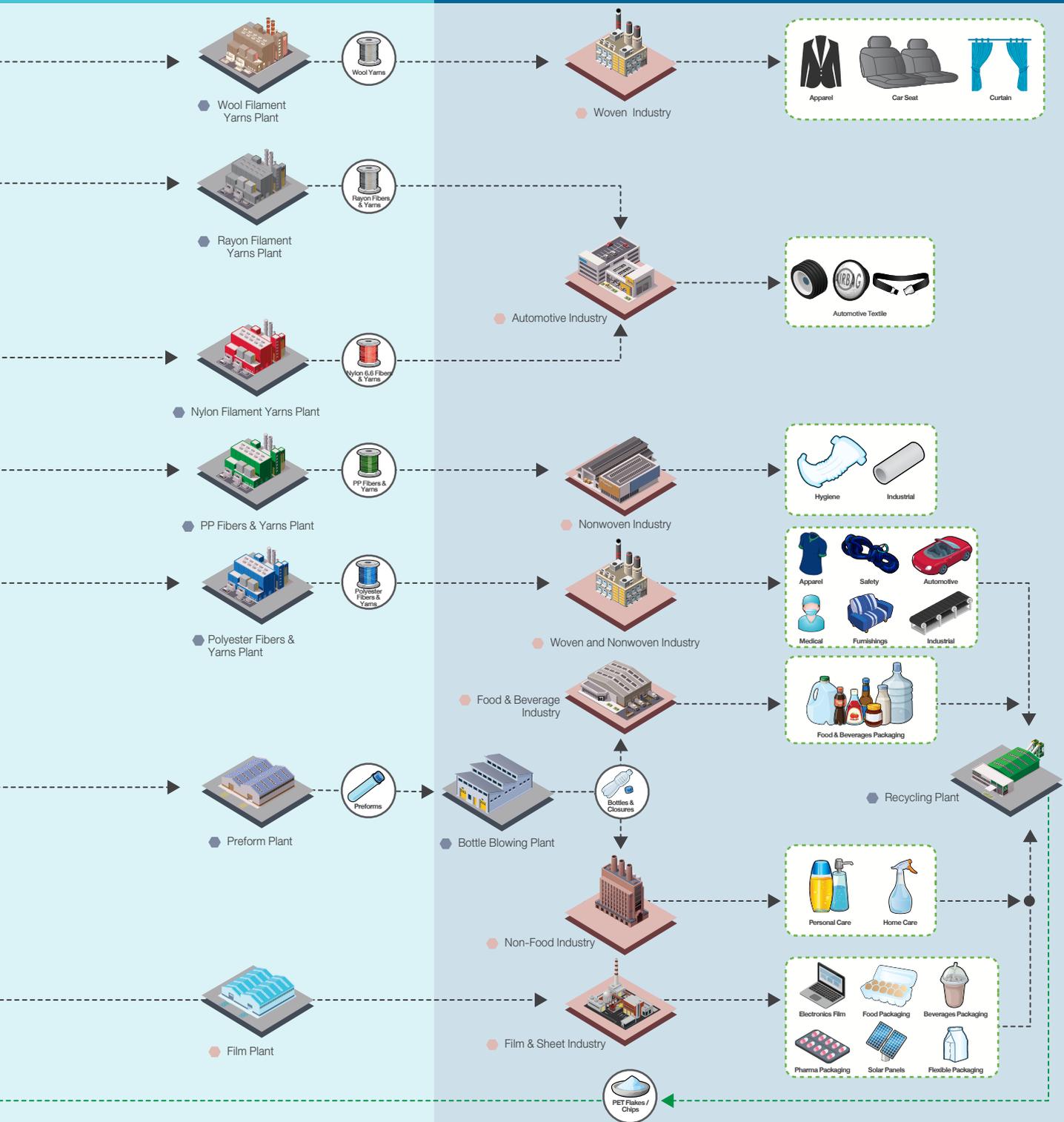
IVL is one of the world's leading petrochemicals producers. In 2018, we have 93 operating sites in 31 countries. The company's portfolio is comprised of 5 business segments: Olefins, Specialty Chemicals, Integrated PET, Fibers and Packaging.



For More Information



DOWNSTREAM



IVL's Sustainable Value Creation for Stakeholders



Our Capitals

4,680

Million USD
Total Equity

59.9

Million GJ
Energy
Consumption

11.8

Million Tons
Raw Materials

60.3

Million m³
Water
withdrawal

30.43

Training hours
per employee

173.60

USD
Training
expenditure
per employee

15,221

Permanent
Employees

2.35

Million USD
CSR
Contribution



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 value 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.

31 Countries **93** Sites

5 Continents **5** Segments

15 Research Centers



Our Results

10,741

Million USD
Total Revenue

789

Million USD
Core Net Profit

11.34

Million Tons
Total Production
(including
intercompany sales)

350,903

Tons of PET
Recycling

23%

Vitality Index
Fibers Business

33%

Vitality Index
PET HVA
Business

86.01%

Customer
Satisfaction Index

93%

Customer
Retention Rate

5.6%

GHG Emission
Intensity Reduction

3.8%

Energy Intensity
Reduction

2.75

Million GJ
Renewable
Energy

6.9%

Increase the Use
of Renewable
energy

8.8%

Water Recycled &
Reused

57%

Waste Reused,
Recycled &
Recovered

3.85

Employee
Engagement Score

5.89%

Turnover rate

TRIR = 1.29

Cases / 200,000
man-hours

LTIFR = 3.71

Cases / 1,000,000
man-hours

0

Fatalities

0

Human Rights
violations

552

CSR Activities



For More
Information

Sustainable Development Goals (SDGs) and IVL

Considering the nature of business, IVL is committed to play its role by contributing to the achievement of following Sustainable Development Goals.

The fully coloured goals are directly impacted by business activities which IVL strongly supports. The faded goals are indirectly impacted by business activities which IVL keeps monitoring.



***	3 Good Health and Well-Being	Guaranteeing the health and safety of our products, employees and contractors
***	4 Quality Education	Providing learning and development opportunities to all staff and promoting recycling education in society
***	12 Responsible Consumption and Production	Reducing the impacts of our products in the use phase and promoting ways to include recyclability
***	13 Climate Action	Improving resource use, energy efficiency, and developing strong low-carbon strategies
***	14 Life Below Water	Collaborating with like-minded organizations to address waste in oceans
***	15 Life on Land	Adverse environmental impacts and monitoring the areas near our operations
***	17 Partnerships for the Goals	Partnering with organizations to intensify our contributions to the circular economy
**	6 Clean Water and Sanitation	Managing sustainable water use and analyzing global water risk with mitigation action plans
**	8 Decent Work and Economic Growth	Providing decent working conditions, equalities and non-discrimination in our operations
*	7 Affordable and Clean Energy	Increasing the use of electricity from renewable sources where possible

Remark : *** = Major ** = Moderate * = Monitor

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 to 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 RobecoSAM’s Sustainability Yearbook 2019 and was listed in the Dow Jones Sustainability Indices (DJSI).**

We are **ranked among the top 10% of Global Chemical Companies** and **one of only two companies in the DJSI Emerging Markets Chemical Industry.**

This inclusion confirms our excellent performance among the world’s leading companies in the chemicals sector and our commitment to leadership in sustainability.



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

CDP’s international platform measures, discloses, manages and shares vital environmental information in order to prevent climate change, value natural resources, and encourage a sustainable supply chain.



FTSE4Good

Indorama Ventures PCL **remains a constituent of the FTSE4Good Index Series following the June 2018 index review.**

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

The index is designed to measure the performance of companies demonstrating strong and excellent Environmental, Social and Governance (ESG) practices based on publicly available data.



In 2018, Indorama Ventures **achieved Gold Recognition, ranking in the top 3% of companies** rated by EcoVadis in the **manufacture of basic chemicals.**

The EcoVadis CSR Rating assesses global corporate sustainable procurements practices in four themes: Environment, Labor and Human Rights, Ethics and Sustainable Procurement.



We achieved the highest Bloomberg ESG disclosure score, and were ranked number one among companies on the Stock Exchange of Thailand (SET50).

Bloomberg evaluates companies on an annual basis, collecting publicly disclosed ESG information disclosed by companies as well as through direct company contact.



Indorama Ventures was **graded BB for the ESG rating in 2018.**

MSCI is an independent provider of research-based indices and analytics. The research is conducted in order to facilitate the world’s leading institutional investors in managing their portfolios.



Indorama Ventures achieved an overall ESG score of 68.

Sustainalytics ESG Ratings measure how well companies proactively manage the environmental, social and governance issues that are the most material to their business.



Indorama Ventures was presented with the **SET Sustainability Awards 2018** in the Outstanding category, received the **Thailand Sustainability Investment (THSI) Award** for the fourth consecutive year, and also received the **Best Sustainability Report Award** from the Stock Exchange of Thailand (SET).



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 2018, we played an active role in various industry associations.

We are a member of several industry associations including:

The Federation of Thai Industries, Thailand

Thai Beverage Industry Association, Thailand

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



For More Information



Indorama Ventures Public Company Limited (IVL) received the Thailand Sustainability Investment (THSI) award for the fourth consecutive year and the SET Sustainability Awards – Outstanding Sustainability Award in 2018.



Indorama Ventures (IVL) received the Best Sustainability Award 2018, organized by the Securities and Exchange Commission and the Thai Listed Companies Association.

SUSTAINABILITY

AT INDORAMA VENTURES



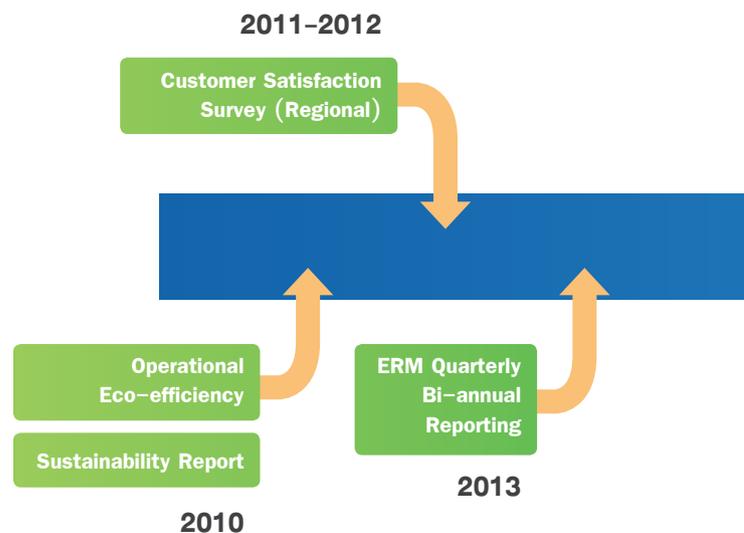
Our success

not just by economic gains but by our achievements in preserving the environment, thereby benefiting society

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

IVL has a deep commitment to sustainability that serves as the foundation of our overall business strategy. Our Sustainability Initiatives fully support the new vision of becoming a world-class chemical company making great products for society. An increased focus on sustainable operations in environmental and social dimensions, especially in innovation management, product stewardship, occupational health and safety, will help in achieving this vision.

Our goal is to ensure economic prosperity and sustainability to all our stakeholders. We measure our success not just by economic gains but by our achievements in preserving the environment, thereby benefiting society.



Sustainability Governance

The Board of Directors (the ‘Board’) is the highest governing body at IVL and is responsible for the strategic direction of the organization and the effective monitoring of performance.

The Board has been embedding 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 (the ‘SRM Committee’). The SRM Committee operates in accordance with the Sustainability and Risk Management Committee Charter which is published on our website: www.indoramaventures.com.

The members of the SRM Committee possess in-depth knowledge and vast expertise in sustainability and risk management. The SRM Committee is the second highest authority pertaining to sustainability and comprises seven members of the Board, including four Independent Directors. The Group CEO chairs the SRM Committee and is supported by two CEOs, the Chief Risk Officer, Functional Heads, and Plant Heads together with the Sustainability Steering Committee whose members have diverse expertise across different functions and businesses. The structure of the SRM Committee is available on our [website](#).

Further details on our approach to Sustainability and Risk Management are available on our [website](#).

Key Sustainability Initiatives in 2018

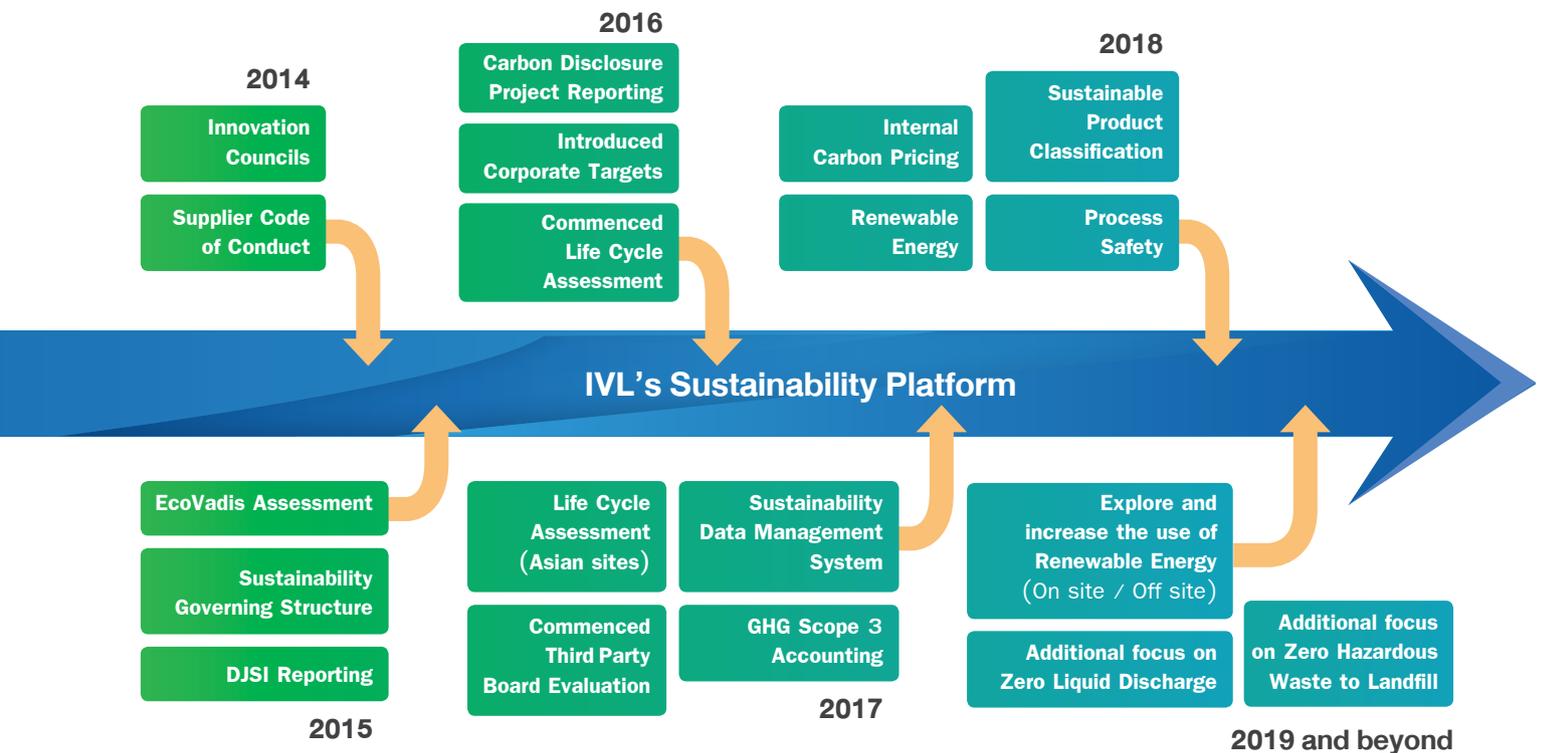
In 2018, IVL carried out several environmentally and socially beneficial activities including:

- Internal Carbon Pricing
- Renewable Energy Possibilities Assessment and Initiatives
- Sustainable Product Classification Study
- Reinforcement Human Rights protections at all of our operations and throughout the value chain, and the human rights assessment results
- Commitment and program on diversity
- Implementation of our process safety approach and reporting scheme

The Report of the SRM Committee for 2018 for shareholders of the Company is published in our Annual Report which is available on our [website](#).



For More Information



MATERIALITY

ASSESSMENT



**Think in a
more integrated way**
about sustainability
and to further expand
our business strategy

Materiality Assessments provide us with a tool to prioritize and make sense of the sustainability landscape as well as a powerful mandate to focus and act on topics that are the highest priority for the business and stakeholders. Similar to previous years, in 2018, IVL carried out a materiality assessment in accordance with the GRI Standards, together with our business strategy, and environmental and social priorities to identify and prioritize primary sustainability material topics that could impact the Company and external stakeholders. This helps us to develop risk mitigating actions and explore remedial opportunities. Our worldwide stakeholders, including customers, suppliers, bankers, the media and employees, provided information on 38 topics with potential relevance to IVL and external stakeholders, rating them in terms of their current and future relevance.

The layout of the materiality matrix was improved in 2018 to increase clarity. The matrix represents the range of influences on the assessments and decisions of stakeholders in each topic and the potential ESG impacts. Ranking the material topics through materiality assessments in terms of risks and opportunities for both the business and broader stakeholders helps us to think in a more integrated way about sustainability and to further expand our business strategy. Based on our assessment, the most important material topics for IVL and our stakeholders are presented in the Materiality Matrix 2018.

Materiality Assessment Process at IVL

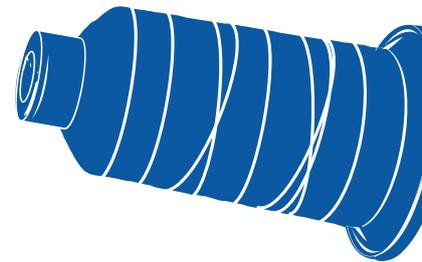


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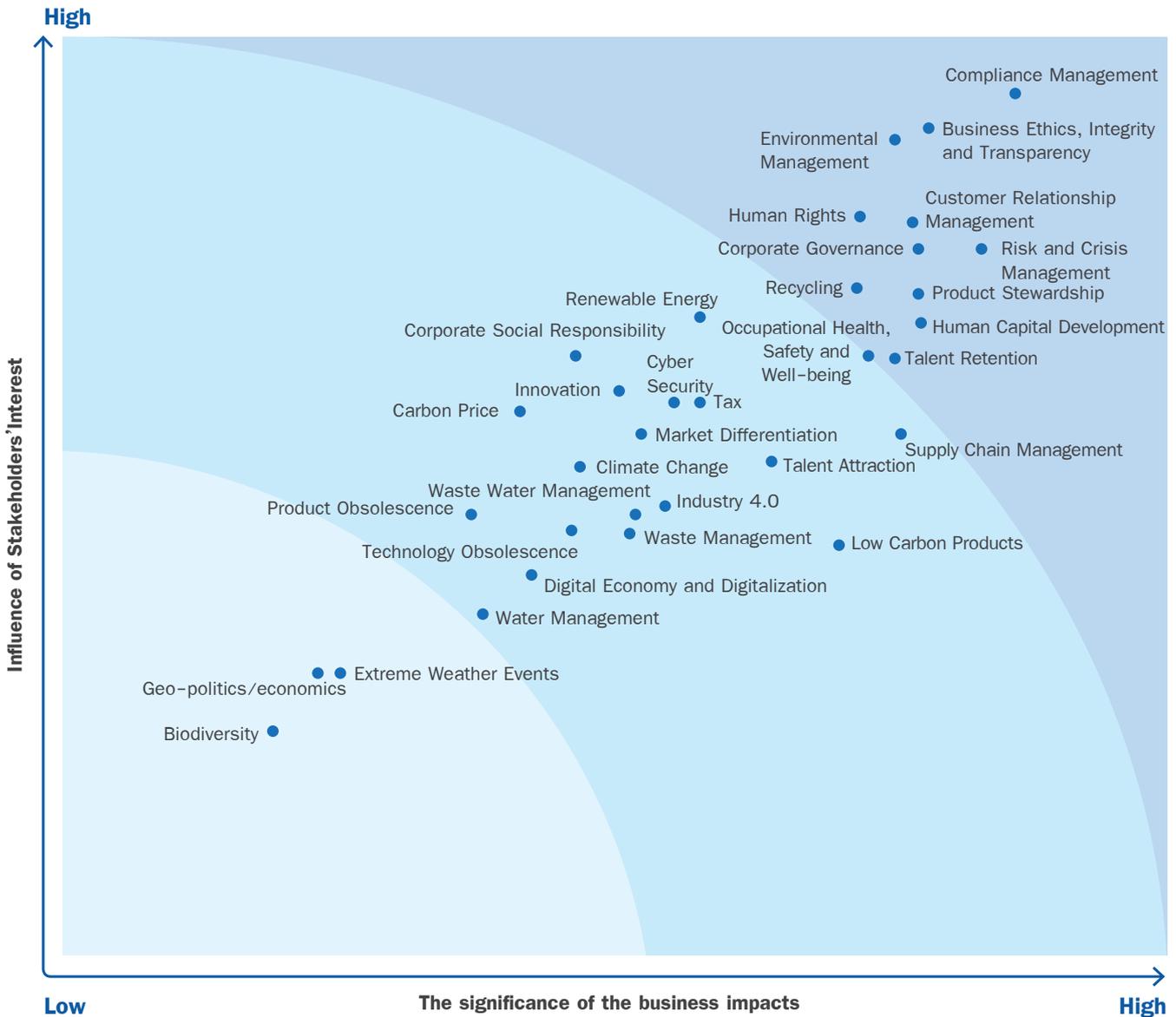


Materiality Assessments

help us to develop risk mitigating actions and explore remedial opportunities



Materiality Matrix 2018



Material Topics

The materiality assessment sets out the twelve key material topics for 2018 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.



Material Sustainability Topics

IVL Material Topics	Corresponding GRI Topics	Key Stakeholders and Level of Impact		Ongoing IVL Commitments and Targets
		Within the Organization	Outside the Organization	
Corporate Governance	<ul style="list-style-type: none"> • Governance • Anti-corruption • Management Approach 	<ul style="list-style-type: none"> • All Managerial Control • Employees 	<ul style="list-style-type: none"> • Business Partners • Regulators, Government 	<ul style="list-style-type: none"> • To be globally recognized for good corporate governance standards and practices • To embed an organizational culture of zero corruption, transparent business ethics and conduct, and compliance with laws and regulations • Zero corruption • Excellent 5-Star CG Rating from the Institute of Directors, Thailand
Business Ethics, Integrity and Transparency	<ul style="list-style-type: none"> • Ethics and Integrity • Anti-corruption • Human Rights Assessment • Public Policy • Child Labor • Management Approach 	<ul style="list-style-type: none"> • All Managerial Control • Employees 	<ul style="list-style-type: none"> • Business Partners • Contractors • Regulators, Government 	<ul style="list-style-type: none"> • Business conduct and ethics training and creating awareness to all employees by 2020 • Zero corruption • Publicly reporting any material non-compliance
Compliance Management	<ul style="list-style-type: none"> • Ethics and Integrity • Anti-corruption • Socioeconomic Compliance • Environmental Compliance • Management Approach 	<ul style="list-style-type: none"> • Manufacturing Operations • License to Operate • Environmental Compliance 	<ul style="list-style-type: none"> • Business Partners • Community • Regulators, Government 	<ul style="list-style-type: none"> • Zero non-compliance • Beyond all applicable environmental compliance
Risk and Crisis Management	<ul style="list-style-type: none"> • Ethics and Integrity • Economic Performance • Management Approach 	<ul style="list-style-type: none"> • Employees • Manufacturing Operations 	<ul style="list-style-type: none"> • Business Partners • Contractors • Community • Regulators, Government 	<ul style="list-style-type: none"> • Identification and continuous monitoring of emerging risks
Customer Relationship Management	<ul style="list-style-type: none"> • Customer Health and Safety • Marketing and Labeling • Customer Privacy • Management Approach 	<ul style="list-style-type: none"> • Management • Sales and Marketing Personnel 	<ul style="list-style-type: none"> • Business Partners 	<ul style="list-style-type: none"> • Customer Satisfaction Index (CSI) and Customer Retention Rate (CRR) are better than or equal to the previous year

IVL Material Topics	Corresponding GRI Topics	Key Stakeholders and Level of Impact		Ongoing IVL Commitments and Targets
		Within the Organization	Outside the Organization	
Environmental Management	<ul style="list-style-type: none"> • Energy • Water • Emissions • Effluent and Waste • Environmental Compliance • Management Approach 	<ul style="list-style-type: none"> • Employees • Manufacturing Operations 	<ul style="list-style-type: none"> • Business Partners • Contractors • Community • Regulators, Government 	<ul style="list-style-type: none"> • 6% GHG Intensity Reduction of Scope 1 and Scope 2 by 2020 from 2013 levels • Reduce or maintain the hazardous waste intensity from the previous year
Recycling	<ul style="list-style-type: none"> • Materials • Economic Performance • Emissions • Customer Health and Safety • Management Approach • Organizational Profile 	<ul style="list-style-type: none"> • Employees • Manufacturing Operations 	<ul style="list-style-type: none"> • Business Partners • Contractors • Community • Regulators, Government 	<ul style="list-style-type: none"> • To incorporate a minimum 750,000 tons of PET post-consumer materials as feedstock into our PET production by 2025 • To increase the utilization rate at recycling plants
Product Stewardship	<ul style="list-style-type: none"> • Customer Health and Safety • Emissions • Management Approach 	<ul style="list-style-type: none"> • Manufacturing Operations • Employees 	<ul style="list-style-type: none"> • Business Partners • Contractors • Regulators, Government 	<ul style="list-style-type: none"> • 7% revenue from Low-carbon products by 2020 • Product toxicity reduction • Sustainable Products Classification by 2020



IVL Material Topics	Corresponding GRI Topics	Key Stakeholders and Level of Impact		Ongoing IVL Commitments and Targets
		Within the Organization	Outside the Organization	
Human Rights	<ul style="list-style-type: none"> • Non-discrimination • Freedom of Association and Collective Bargaining • Human Rights Assessment • Child Labor • Forced or Compulsory Labor • Right of Indigenous Peoples • Supplier Environmental Assessment • Supplier Social Assessment • Security Practices • Ethics and Integrity • Management Approach 	<ul style="list-style-type: none"> • All IVL employees 	<ul style="list-style-type: none"> • Suppliers • Contractors • Community 	<ul style="list-style-type: none"> • Ensuring compliance with the fundamental rights of the workforce, as per UN Guiding Principles and ILO standards • Zero human rights violations • Embedding human rights in our mergers and acquisitions • Human Rights Risk Assessment in value chain
Human Capital Development	<ul style="list-style-type: none"> • Employment • Training and Education • Organizational Profile • Management Approach 	<ul style="list-style-type: none"> • All IVL employees 		<ul style="list-style-type: none"> • Unlocking internal leadership potential and developing leaders who can deliver and drive the organization towards its new vision • Building and shaping world-class talent systems and culture
Talent Retention	<ul style="list-style-type: none"> • Employment • Diversity and Equal Opportunities • Economic Performance • Organizational Profile • Management Approach 	<ul style="list-style-type: none"> • All IVL employees 		<ul style="list-style-type: none"> • To keep talented staff and high performing employees within the organization • To reduce the percentage of the turnover rate
Occupational Health, Safety and well-being	<ul style="list-style-type: none"> • Occupational Health and Safety • Training and Education • Effluent and Waste • Asset Integrity and Process Safety • Ethics and Integrity • Organizational Profile • Management Approach 	<ul style="list-style-type: none"> • Manufacturing Operations • Employees 	<ul style="list-style-type: none"> • Business Partners • Contractors • Community 	<ul style="list-style-type: none"> • Zero fatalities • Year-on-year reduction in injuries (TRIR and/or LTIFR, 2% reduction over previous year)



Economic



Good corporate governance

allows us to measure our integrity and achieve sustainable business growth and long-term value for our stakeholders.

Corporate Governance Business Ethics, Integrity and Transparency Compliance Management

Our efforts are aligned with the following SDGs:



Good corporate governance allows us to measure our integrity and achieve sustainable business growth and long-term value for our stakeholders. The Board provides guidance on the governance structures to ensure ethical practices and transparency. Processes to drive good governance include the preparation and communication of corporate controls, key policies, enterprise risk management, regulations, and compliance management, while continuous monitoring is achieved by the risk management and audit committee. An effective and transparent corporate governance and enterprise risk management structure ensures ethical conduct and regulatory compliance.



The Catalyst for where IVL Stands Today



Corporate Governance

With a rapidly growing business, expansion into new regions and with new products being added to the portfolio every year, we believe that corporate governance is an important part of sustainability. To ensure that we can adapt quickly, we established corporate governance policies and a broad range of governance, risk and compliance initiatives across the organization. Both the board and management are committed to their implementation and practice globally.

At IVL, good corporate governance starts at the top. A skills matrix for the Board of Directors was created to ensure optimum Board composition and outlines the desired capabilities of the board in order that it meets both our current and future challenges. The matrix also provides an opportunity to evaluate the board's composition and consider its future structure in alignment with the strategic objectives of the Company. The board nomination process takes into account any actual and potential conflicts of interest of any board member in-line with good corporate governance.

The following key actions were taken in 2018 to strengthen our corporate governance:

1. The Board designated a retirement age of 72 for Independent Directors in order to maintain a strong composition.
2. The Board formalized the appointment of the Lead Independent Director. The roles and responsibilities of the Lead Independent Director can be found on [our website](#).
3. The Board encouraged its members, the management team, Company Secretary and Internal Auditor to attend seminars, training

programs, and courses that assist in further improving their contributions to the Company. Three of our independent directors participated in training courses as noted below:

- Mr. Maris Samaram:
 - a. Risk Management Program for Corporate Leaders (RCL) Class No. 13/2018
 - b. IT Governance and Cyber Resilience Program (ITG) Class No. 8/2018
- Mr. Russell Leighton Kekuewa: Strategic Board Master Class (SBM) Class No. 3/2018
- Mr. Chakramon Phasukavanich: Board Matters and Trends Agenda Class No. 6/2018

4. The Board and subcommittee members carried out a self-evaluation of their performance in 2018. The results were summarized and discussed at the Board meeting held in February 2019 where members were evaluated with a very satisfactory rating of their performance in 2018. The key responsibility areas (KRAs), key performance indicators (KPIs), and variable compensation metrics of executive directors and senior management included environmental, social and governance indicators along with economic performance (including EBITDA and ROCE, among others).
5. The Institute of Directors, Thailand carried out an independent assessment of the Corporate Governance practices and Board's performance during the year and presented their report to the Board in November 2018. The report was more than satisfactory and some recommendations were given to improve overall effectiveness.



Corporate Governance Evaluation

Corporate Governance and Board Evaluation was carried out for the first time by external professional body (IOD) and the findings found that IVL has a strong sustainability mindset and governance structure.



An **Excellent 5-Star** CG Score in the practice of **Corporate Governance of Thai-Listed Companies**

Business Ethics, Integrity and Transparency

IVL values responsible business growth and profitability and is committed to operating with the highest standards of business ethics, and in many cases, by going above and beyond compliance of applicable laws, rules and regulations.

Under our Corporate Governance Policy Awareness Campaign (CGPAC), our Code of Business Conduct and Policies is an integral part of our guiding principles and ethical standards and drives the way we conduct business around the world - with a strong focus on integrity. They are available on our website in 18 languages under the “[Corporate Governance](#)” section on our website.

Training courses are taught through both live seminars and online self-learning courses. A total of 82% of all IVL employees have attended such training sessions in the past three years with 76% of sites having achieved 100% training coverage of their employees.



Anti-Corruption

We regularly review our Anti-Corruption Policy to ensure that it remains up-to-date with current anti-corruption standards. IVL also adheres to the UK Bribery Act and all local, national and international laws where applicable. We adopted an anti-corruption framework which nurtured a corruption-free culture and helped IVL become a certified Collective Action Against Corruption (CAC) company in Thailand, a position we successfully renewed in May 2018.



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.)

Political activities and contributions

While we respect the right of employees to participate in political activities, IVL does not take any political position. Although the majority of our business deals are not directly related to government, 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 a positive impact. Additional information is available under “[CSR Activities in 2018.](#)”

No direct political donation or contribution was made by IVL or our subsidiaries in 2018.

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 integrated the same as a component of the organization's risk management program. Through a top-down approach, the Sustainability and Risk Management Committee, the Audit Committee and senior management continues to advise all concerned on emerging risks and compliance requirements.



As of 31 December 2018, there was no material litigation against IVL or our subsidiaries that could have a negative effect on our assets exceeding 5% of shareholders equity. There was also no litigation that could have a significant effect on our business. Furthermore, in the past four years, 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 or anti-competitive practices have been brought against IVL or our employees

We are targeting the same outcome for 2019.

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



Whistleblower Mechanism

Our Whistleblower Policy governs the reporting and investigation of allegations of improper activities. In all instances, the Whistleblower Committee retains the prerogative to determine when the circumstances warrant an investigation and, in conformity with the policy and applicable laws and regulations, the appropriate investigative process to be employed. Internal and external stakeholders can help support good corporate governance at IVL by reporting any policy violations through our various Whistleblower Reporting Channels.

In 2018, two cases were filed with the Whistleblower Committee. The first case was closed and required no further action as there was no breach. The second remains under investigation. The results of the investigations thus far were reported to the NCCG Committee and the Board of Directors.

The Whistleblower Center, a new Whistleblower reporting channel through an independent website, was created to provide an additional communications channel. It has launched and was communicated to all employees in early 2019. Further details are available on [our website](#).

Risk and Crisis Management

Our efforts are aligned with the following SDGs :



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 & Risk Management Committee (SRMC), Sub-committees and Risk Champions play an important role in endorsing risk management throughout the entity which encourages the establishment of lines of authority, and the distinct roles and responsibilities of management and employees.

“Through a well-designed risk management approach, our businesses ensures sustainability and business continuity.”

Risk Assessment

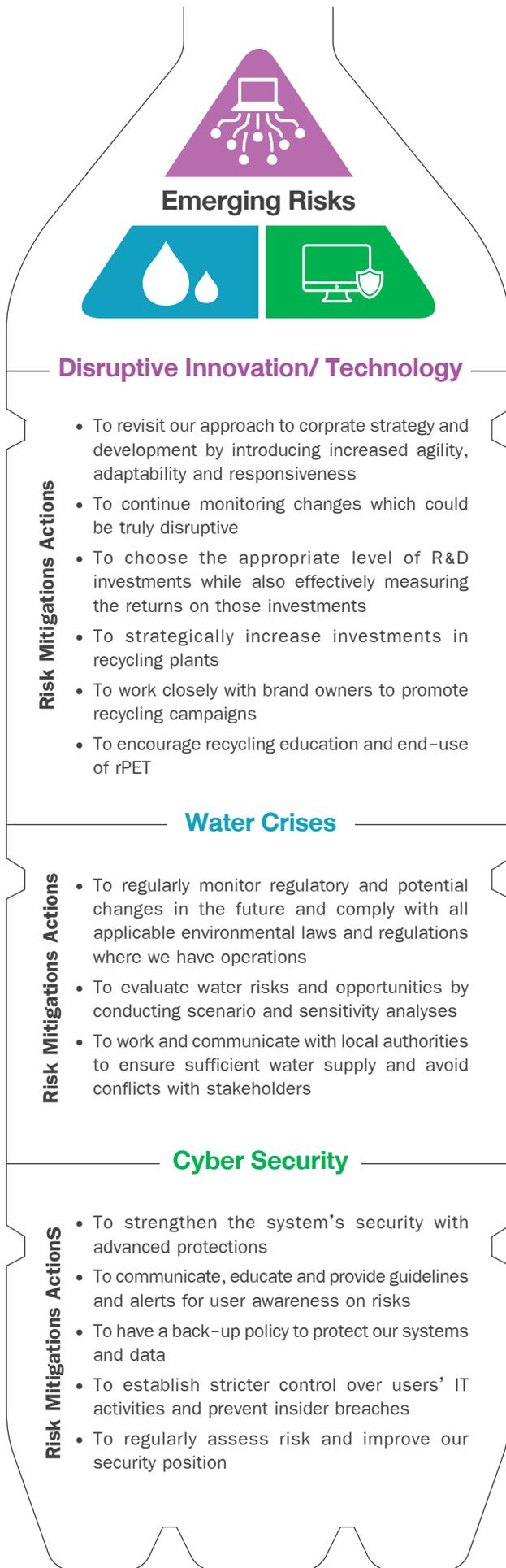
We conduct a company risk assessment that allows any entity to obtain a holistic view of the risks it faces and allows management to identify these risks and capitalize on opportunities. We assess the potential impact and likelihood of risks. This covers the assessment and review of internal and external 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 the [Annual Report 2018](#).

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 committee reports to the Board periodically on its activities and evaluates its performance on an annual basis.



For More
Information



Sensitivity Analysis

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

We also conduct scenario analysis and 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 chain are also an important part of our risk management. Additional information on water risks and human rights risks is available in other chapters of our [Sustainability Report 2018](#).

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.

In 2018, some of our directors attended training on risk management, further details are available in the Corporate Governance section in this report.

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 of Directors 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.

Customer Relationship Management

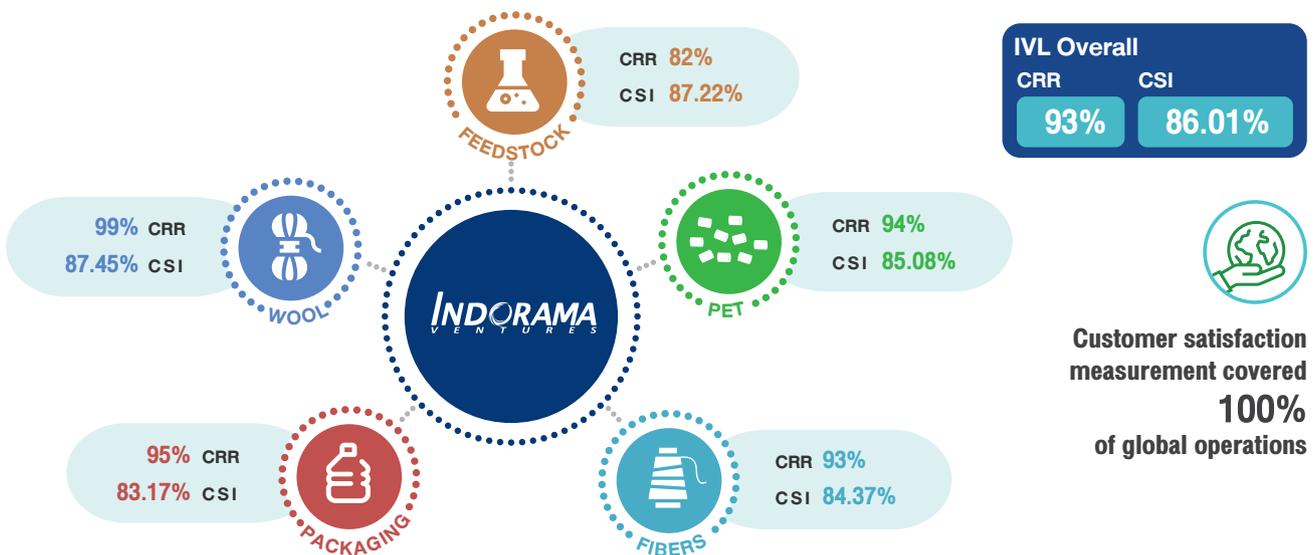
Our efforts are aligned with the following SDGs :



IVL is a market leader in the polyester value chain. In order to maintain this position and drive consistent 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 and an important part of our sustainability strategy. We collaborate through various communication channels with our customers to listen to their advice and needs on regular basis. Customer Satisfaction Survey is one of them. In 2018, the Customer Satisfaction Index maintained a consistently high level at 86.00%, even though the number of responses from our global operations was higher than in 2017.

“Customer Relationship Management is an integral part of our long-term success.”

2018 Customer Satisfaction Index (CSI) and Customer Retention Rate (CRR)



Note: Overall coverage scores of the Customer Retention Rate (CRR) by percentage of total revenues



For More Information

In addition, from the results, customers can anticipate our developments on innovation and products, as well as services. Therefore, our innovation teams take into account the needs of our customers in their R&D planning to achieve increasingly greater customer demand. This always drives our product and service innovation approach, which converge to ensure that we move closer to one of our values: the customer is why we exist. The following is an example of product development in collaboration with customers to serve their requirements.

In 2018, there no incidents of non-compliance concerning:

- health and safety impacts of our products*
- marketing communications*
- breaches of customer privacy and losses of customer data*



In 2018, Glanzstoff Sicrem, our wholly owned subsidiary in Italy, was awarded the “Supplier Award” from Pirelli in the category of “Quality and Speed.” The selection process involved about 12,000 suppliers covering eight fields.

Pirelli is the official and only supplier for Formula 1 and the Superbike World Championship, and supplies tires to other rally and motocross competitions. Furthermore, Pirelli is the only tire supplier to some of the most prestigious car manufacturers. For these kinds of applications, Glanzstoff Sicrem is Pirelli’s only supplier. Glanzstoff Sicrem was involved in developing the fabric and single end for F1 tires involving four codes and guaranteeing zero defects in terms of quality.

Glanzstoff Sicrem was able to conduct trials and deliver materials under tight cut-off times of as little as one week. Additional assistance involved producing several textile samples for selection for Pirelli’s new 18-inch tires for F1, and operating a prototype machine to produce new textile reinforcement materials mixing aramid and polyamide 66. Through Glanzstoff Sicrem’s work, Pirelli was able to launch a new tire on the market in less than one year.

At the Supplier Award, of the suppliers who were awarded in the eight categories, only one was chosen for the prestigious “Sustainability” prize. This recognition went to Glanzstoff Sicrem

for producing rayon using only cellulose from plantations certified for sustainable agro-forestry management, reinforcing the company’s vision and values.



Innovation Management

Our efforts are aligned with the following SDGs :



Innovation adds economic value and more importantly in the case of IVL, also helps us to protect the environment by limiting or reducing the carbon footprint in our manufacturing processes. In addition to reducing product toxicity, this is something our customers demand. While aiming to offer better value and great products to our customers by responding to their ongoing requirements, we anticipate their future needs by rapidly and effectively developing innovative products. In addition to maintaining focused discipline, innovation is closely integrated with Product Stewardship through a formal assessment of a variety of environmental and social impacts.

Innovation currently in development within IVL focuses on new products and solutions that meet social and environmental needs, and which are in-line with our guiding principles and policies for environmental stewardship and sustainability. We have 15 Research & Development (R&D) centers worldwide. For the PET business, R&D is focused on specialty polymer developments in the United States. For the Fibers business, research is conducted in Asia, Europe and the United States, using a Centers of Excellence model. R&D is coordinated at vertical segment level focus groups—automotive and industrial, hygiene and medical, and apparel and home.

In 2018, most of our research and development expenditures were directed towards business and market changes that continue to drive sustainability and directed towards increased opportunities to expand the market.



For More Information

Vitality Index*

Fibers Business

Our Fibers business achieved a vitality index of 23% against a target of 20%. In 2019, we are aiming for a vitality index of 21% excluding new acquisitions.

PET HVA Business

Our High Value-Added (HVA) PET Business is evolving through accelerated innovation and global product growth. Our PET HVA business achieved a vitality index of 33% in 2018 against a target of 33%. Our vitality target for 2019 is 34% excluding new acquisitions.

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





2018 Vitality index*



Fibers Business 23%

2018 Target > 20%



PET HVA Business 33%

2018 Target = 33%

Target Vitality Index* in 2019	21% Fibers Business	34% PET HVA Business

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

IVL is the global industry leader in the integrated PET value chain for PET produced through recycling. Our Recycling business prioritizes environmental stewardship through the effective utilization of natural resources. We play a leading role in the circular economy bringing customers of recycled products into the product value chain, and developing ways to include recyclability into all our products. Our Innovation Management is aligned to meet our customers' goal of progressing towards 100% recyclable and reusable packaging. IVL is moving beyond the role of a polymer producer to one whose recycling operations comprise a growing portion of our portfolio.

We invest in conventional recycling technology and are commercializing chemical recycling manufacturing processes. This cost-effective technology is able to close-the-loop for plastics, allowing the conversion of all post-consumer PET waste back into monomers and subsequently into high-quality food grade PET.

"IVL is committed to contributing to packaging that contributes to the circular economy and tackling global waste."



Collaborating for a Fully Circular Economy

Indorama Ventures and Loop Industries JV introduce a new era in PET and Polyester Recycling.

The Indorama Ventures/Loop Industries partnership brings together IVL's world-class manufacturing footprint and Loop's proprietary science and technology to become a reliable global leader in the "circular" economy for 100% sustainable and recycled PET resin and polyester fiber.

This partnership is unveiling a commercial solution for packaged consumer goods companies in response to the rapid growth in global plastic consumption, for which there is a tremendous 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.



This 50/50 joint venture will have an exclusive worldwide license to use Loop's technology to produce 100% sustainably produced PET resin and polyester fiber. Production from the facility will be fully subscribed by leading global consumer brands.

Environment



We have no negative
impact in the communities
where we operate

Environmental Stewardship

Our efforts are aligned with the following SDGs :



As a company, we recognize the need to continue improving our environmental performance by increasing operational efficiencies, and conforming to environmental laws, regulations, and standards to achieve zero material non-compliance issues. We are aware that legislation may be introduced that can negatively impact our business if we are not proactively taking the lead in protecting the environment. We therefore want to ensure that we have no negative impact in 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, standards and other requirements. 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 EHS managers.

We keep air emissions, spills, 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 continuously analyze the results for further improvements.

In 2018, there were no incidents of major regulatory non-compliances (greater than USD 100,000). However, there were the following two cases at our plants in China:

- » A wastewater treatment station exceeded the environmental standard and paid a penalty of USD 21,964.
- » No label was posted on the gate of a hazardous waste warehouse for which a penalty was paid in the amount of USD 14,643.

Corrective actions were taken in both cases and the lessons learned were shared with all concerned in the group as part of our knowledge sharing efforts. Management has issued additional guidelines to ensure full compliance given our stated commitment to protecting environment.

2018 Target:

- *No major cases of environmental non-compliance*

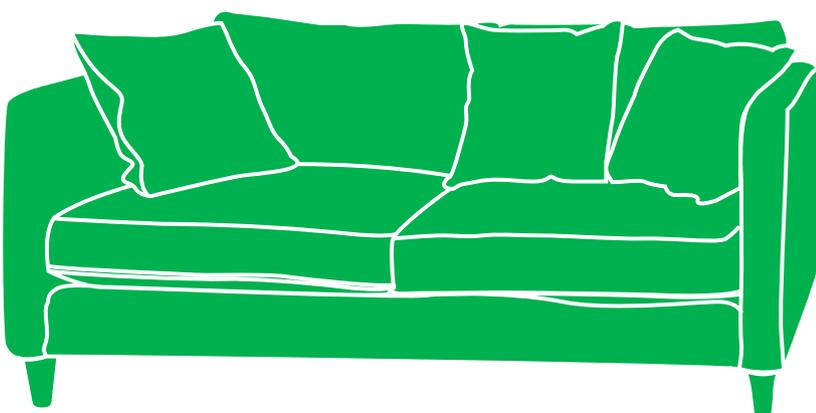
2018 Achievements:

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

2019 Target:

- *No major cases of environmental non-compliance*

For More
Information



Environmental Management

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

- Setting up and reviewing environmental goals and targets.
- Environmental stewardship through operational eco-efficiency, resource conservation, 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, we are committed 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.

As of 31 December 2018, 77% of our operations had ISO 14001 Environmental Management certification and 39% of our operations had ISO 50001 Energy Management certification. The percentage decreased in 2018 from 2017 due to new acquisitions. Further details on our [ISO & Related Certifications](#) are available on our website.

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

Every year, we invest in initiatives that have a positive environmental impact as well as cost-savings. These, and other investments, are monitored using Environmental Return on Investment (EROI) calculations. Through our Management Information System (MIS), we track our capital expenditures, operating expenditures, cost-savings and environmental impacts for all of our projects. In 2018, the annual cost savings from all environmental investments totaled USD 7.2 million, of which 90% of the savings came from growth and energy savings projects.

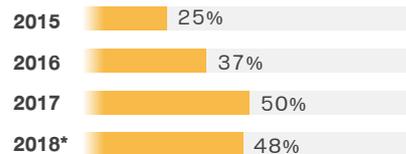


IVL Certification Status

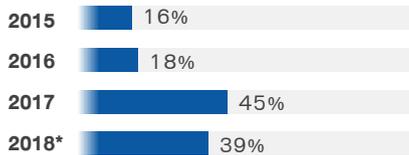
ISO 14001



OHSAS 18001 / ISO 45001



ISO 50001



ISO 9001



* Includes entities acquired in the second half of 2018 but excludes entities not in operation on 31 December 2018 and JVs. The 2018 percentage decreased compared to 2017 due to the acquisition of new sites in 2018.

2020 Target:

100% of operations for ISO 9001 certification, and
98% of operations for ISO 14001, ISO 50001 and OHSAS 18001/ISO 45001 certifications

(*applicable to IVL Group sites which have been in operation in IVL Group for at least two years.)



In TPT Petrochemicals, our wholly owned subsidiary in Thailand, PTA mother liquor stream has suspended solids (originating from the PX molecule) which are normally recovered in filters. The recovery depends on the stream temperature – lower the temperature, better the recovery. Poor recovery indicates a loss of solids to the effluent treatment plant (ETP) causing not only loss of PX molecules, which otherwise would have burnt as CO₂ in the reactor, but also leads to higher treatment loads in the effluent treatment plant. In 2018, TPT installed an additional vacuum flash drum supporting the existing flash drum whose operating pressure was changed to atmospheric from earlier vacuum levels.

The initiative helped considerable PX savings for the year and a reduction in daily COD generation, with total estimated benefits of USD 737,113 for 2018. The GHG reduction was achieved by reducing



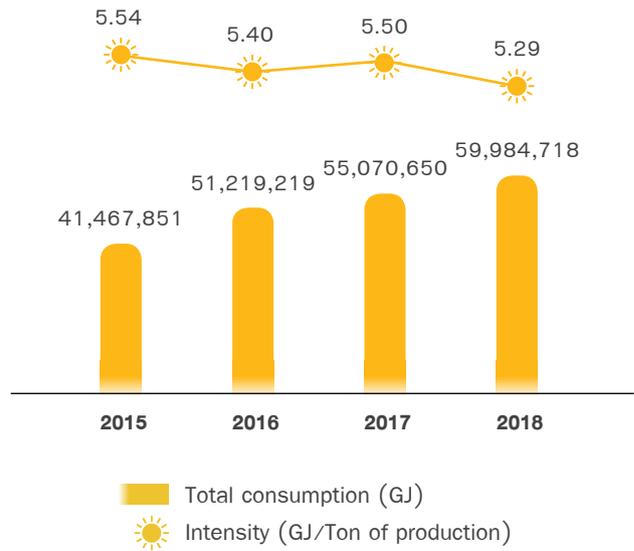
PX consumption resulting in a reduction in CO₂. As a result, the COD load declined which reduced methane generation. The stream temperature, which used to be around 72°C, was reduced to 55°C with the implementation of this project.

Energy

IVL has undertaken several concurrent energy savings initiatives. Our focus on energy efficiency has continuously increased as this further helps our competitiveness by reducing energy costs and any impacts with solutions for a low-carbon economy, and in being proactive in dealing with climate change.

In 2018, there were 38 energy efficiency projects which delivered approximately 416,617 GJ in energy savings, 41,661 in tCO₂e reductions, and 3.8% in energy intensity reductions over the previous year. We are exploring additional options to further lower our energy intensity.

Total Energy Consumption



2018 Target:
Better than or equal to the previous year

2018 Achievement:
3.8% energy reduction from 2017

2019 Target:
Better than or equal to the previous year



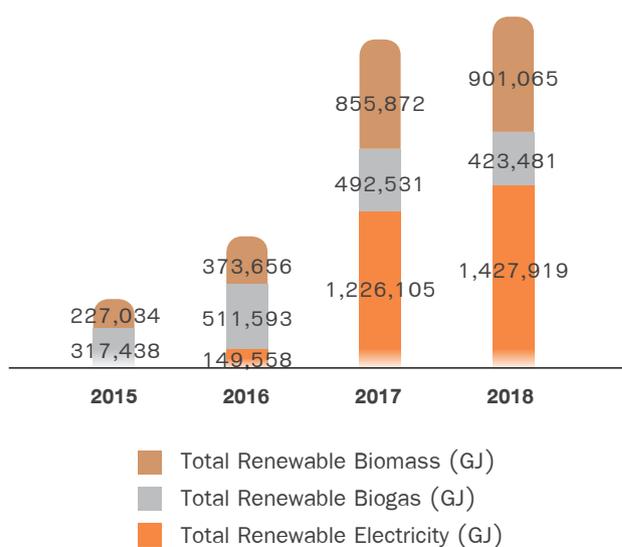
Renewable Energy

IVL looks for opportunities to replace fossil fuels used in our own processes. We are increasing the use of renewable energy across our business as natural resources are finite and we recognize the need to lower our dependency on carbon-based energy production. Three of our plants, Orion Global Pet in Lithuania, Indorama Ventures Quimica in Spain and Wellman International in Ireland, are using 100% renewable electricity. Indorama Holdings in Lopburi, Thailand, installed a 5MW solar power plant to generate renewable energy. Additional renewable electricity projects are being implemented and will be completed in 2019. IVL continues to explore further possibilities to increase the our of renewable energy. We are committed to sourcing more electricity from renewable sources at our sites.

In 2018, the amount of renewable electricity purchased was approximately 16% higher than in 2017. We also consumed biogas and biomass as alternative renewable fuels in our processes and as such, overall renewable energy consumption increased by 6.9% from the previous year.

Our use of 2.75 million GJ of renewable energy resulted in saving over 176,000 tCO₂e.

Total Renewable Energy Consumption



2018 Achievements:

- 16% increase in renewable electricity purchases from 2017
- 6.9% increase in renewable energy use from 2017

Entreprise Indorama PTA Montréal, our wholly owned subsidiary in Canada, was a North American biogas recovery pioneer in 2009 having installed a unit to valorize biogas, thus reducing GHGs. The unit, composed of a compressor, a gas dryer and a gas train/burner successfully started replacing natural gas in a furnace. The biogas was generated by the treatment of its effluent in an anaerobic bioreactor and contains 70–75% methane with a low amount of contaminant and can thus replace natural gas. In 2015, the plant installed a unit to treat one of its upstream effluent to meet a new regulation that had a positive side effect

of increasing the bioreactor's efficiency thereby increasing the available flow of biogas. With the increase in the bioreactor's efficiency, biogas production was higher than the capacity of the recovery unit, which needed to be upgraded to take full advantage of the additional biogas. In 2018, a new biogas compressor, a H₂S removal unit and burner were added. With the new equipment now online, recovery is already higher than the former unit. A total of 1,218,000 Nm³/yr. of natural gas is expected to be replaced by new biogas generating an annual reduction in GHG emissions of 2,300 tCO₂e.

Carbon Footprint

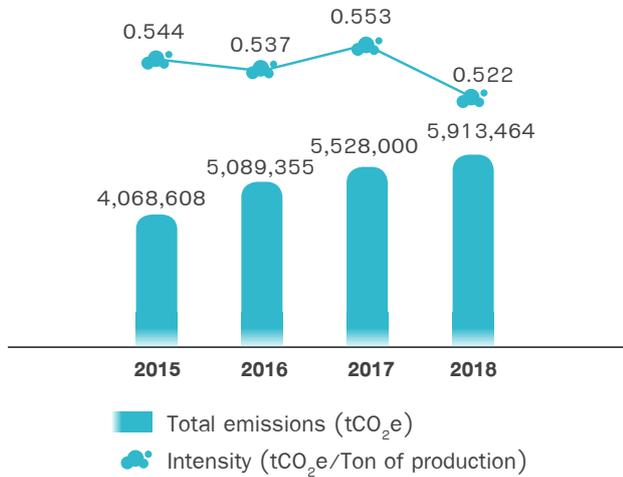
Greenhouse gas emissions from our operations are primarily related to the fuel and power we use. We are actively working to reduce our carbon footprint across the value chain to improve our resource productivity. We are therefore committed to reducing greenhouse gas emissions from our operations in a manner that supports national strategies and which are in-line with our commitment to our stakeholders to operate a sustainable business and finding pathways towards developing effective low-carbon strategies to limit activities that contribute to climate change. In addition to our Climate Strategy 2020, we developed a Climate Strategy Corporate Standard that guides our global operations suggesting best practices for the climate, including GHG management, with key actions and KPIs.

To this end, 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 GHG Accounting Protocols – Greenhouse Gas Protocol on Corporate Accounting and Reporting by the World Resources Institute (WRI)/World Business Council for Sustainable Development (WBCSD) and ISO 14064-1:2006. We also track and record GHG Scope 3 emissions globally for selected criteria.

**“GHG Scope 1 and 2 verification:
The information on GHG Scope 1 and 2 emissions
has been verified by an independent external
assurance auditor in accordance with
GHG Protocol, ISO 14064-1, and ISO 14064-3.”**

Total GHG Emissions – Scope 1 & 2



2018 Target:
Combined Scope 1 and 2 GHG emission intensity reduction at 6% from 2013 levels

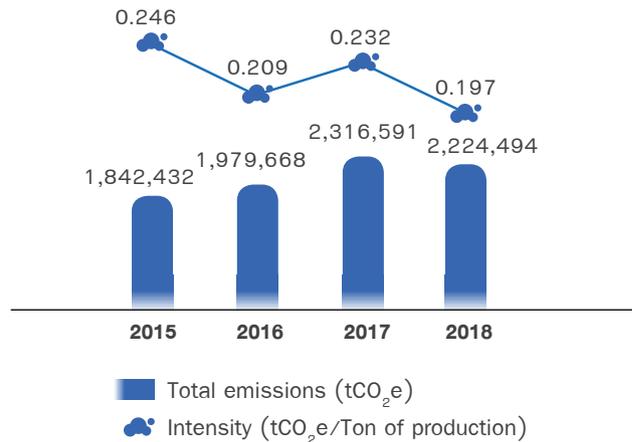
2018 Achievement:
GHG emissions intensity reduced by 5.6% to 0.522 from 0.553 in 2017

2019 Target:
Combined Scope 1 and 2 GHG emission intensity reduction at 6% from 2013 levels

Direct GHG Emissions – Scope 1



Indirect GHG Emissions – Scope 2



We monitored and evaluated 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.

“We see the circular economy as an important instrument in combatting climate change and an opportunity to strengthen our recycling business globally.”

Climate Change 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) into financial and non-financial evaluations. We have considered the IEA 450 scenario for financial analysis by using the internal carbon price as a parameter to quantify monetary impacts, if the carbon tax were imposed in OECD and non-OECD countries. We conducted stress-testing analysis to anticipate the impacts on production, EBITDA, and revenue as part of our risk management process.

In addition, as suggested by the TCFD, we applied the AQUEDUCT water risk atlas to forecast the change in future water stress to identify sites that face the most significant risk in future water demand and supply. The results of these studies 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



Eco Factory Award Certification



On 27 September 2018, Indorama Petrochem Limited, our wholly owned subsidiary in Thailand, received an Eco Factory Certification from the Chairman of the Federation of Thai Industries.

The Eco Factory criteria contains 14 aspects covering various dimensions including use of resources, the economy, society, environment, and management. An “Eco Factory” is a factory that is committed to conducting its operations in an environmentally friendly manner for sustainable development, focusing on the development and improvement of manufacturing processes and continuous and sustainable environmental management that is socially responsible, both inside and outside the organization, and throughout the supply chain.



Water Management

We are committed to sustainable water management (including water withdrawal and discharge) through IVL's Water Management Policy and Strategy by complying with all applicable environmental laws, international standards, and regulations in the countries where we have operations, and will be proactive in demonstrating leadership and responsibility in-line with our values. Sustainably managing our water utilization is an important part of our day-to-day operations. We remain committed to achieving Zero Liquid Discharge at more sites and 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.



For More Information

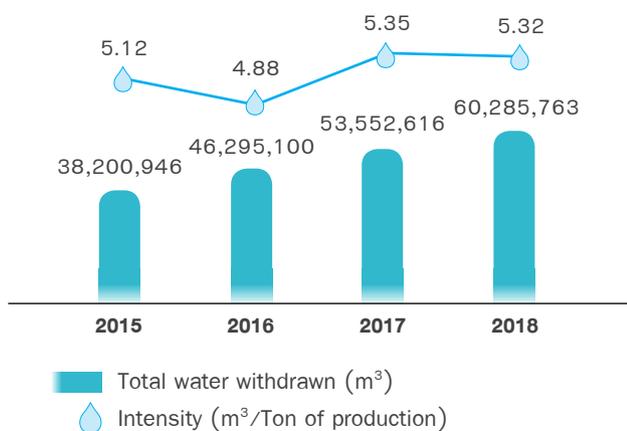
We achieved our 2018 water target. The intensity was reduced from 5.35 m³/ton of production in 2017 to 5.32 m³/ton of production in 2018. Despite an increase in total water consumption, the total amount of water recycled and reused was 8.78% of total water consumption.

2018 Target:
Reduce or maintain the intensity from the previous year

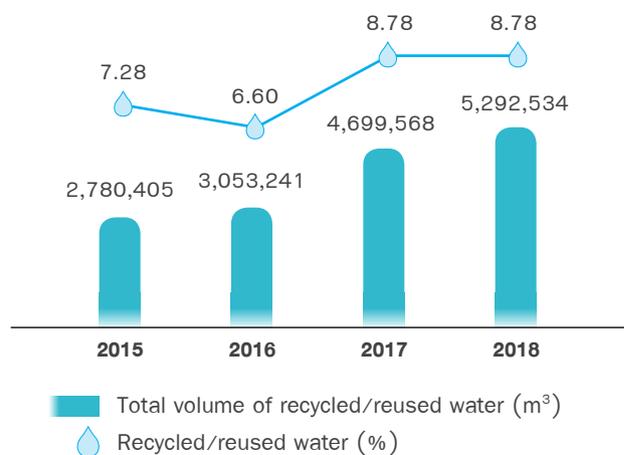
2018 Achievement:
Water intensity reduced to 5.32 from 5.35 in 2017

2019 Target:
Reduce or maintain the intensity from the previous year

Total Water Withdrawal



Water Recycled & Reused



Water Risk

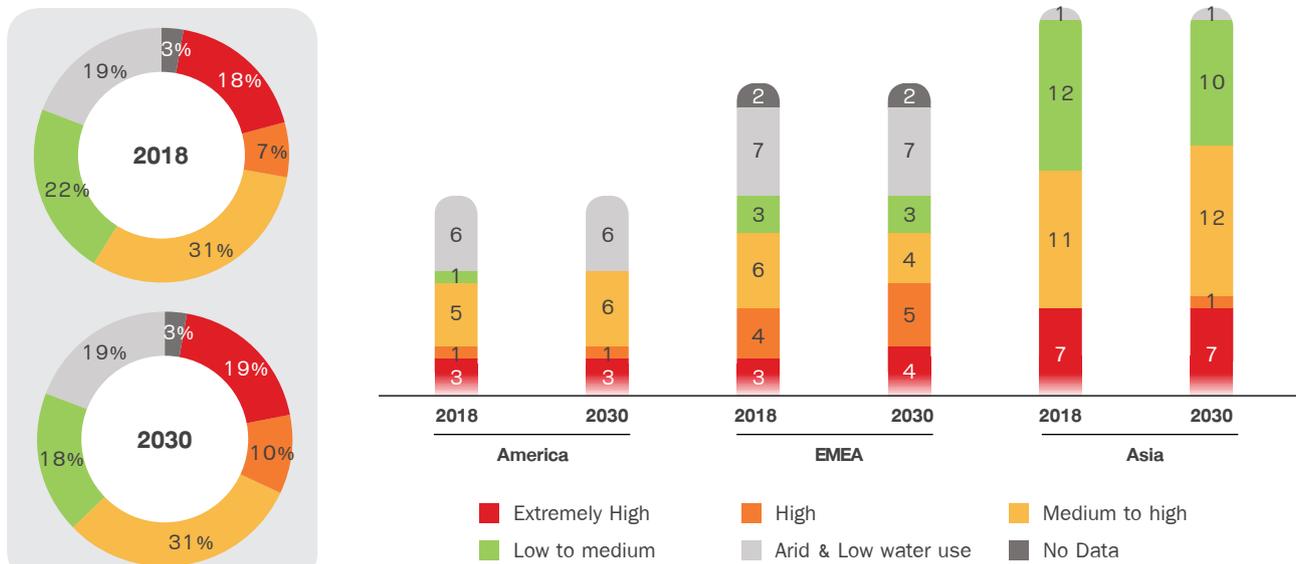
IVL is conscious of water risk and is demonstrating responsibility through our efficient water management stewardship. We focus on local water risk assessments and through follow-up, have an effective risk management system in place, and regularly assess our exposure to water related risks. In 2018, we conducted a water sensitivity analysis using the AQUEDUCT Water Risk tool developed by WRI to identify water stress locations. This tool helps us to evaluate changes in water demand, water supply,

stakeholder risk, and regulations based on current and future conditions. It also enables 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 quarterly 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.

We also calculated the associated water costs from this assessment. From the results and cost estimations, we communicate directly with plants to develop clear action plans and assign water champions to coordinate with

all plants and regularly report to management. Further details are available in the “Risk Factors” section of our Annual Report 2018.

Water Stress Assessment* : Current and Future



* Assessment conducted using the AQUEDUCT Water Risk Tool developed by WRI.



Wastewater is 100% recycled at IVPSA

Analytical tests of wastewater discharged outside the Indorama Ventures Polimeros (IVPSA), our wholly owned PET plant in Brazil, indicated an opportunity to treat the water through a simple coagulation/sedimentation system, and to reuse it as part of the Water Cooling Tower make-up. Following some changes in the organic stripping column outlet stream, together with the implementation of new pumps and some other adaptations to the pipes, the system was able to recover the water. These modifications have saved about 185,000 m³ per year of wastewater from being discharged outside the plant, thereby reducing raw water consumption as a result. The initiative resulted in significant savings up to USD20,000 per year.

IVPSA plant reduces raw and potable water consumption

With 100% of wastewater being recovered, three projects were implemented to reduce both raw and potable water consumption onsite. The two raw water projects aimed to recover part of the Water Cooling Tower purge and take advantage of rainwater during the winter season. The first project treats the Cooling Tower purge in a coagulation/sedimentation system, followed by a reverse osmosis machine to remove Antimony and Phosphorus salts. This allows the water to be reused in the Tower reducing raw water consumption by 26,000 m³/year. The second project, which runs until 2020, transfers and reuses rain water from the PET resin warehouse to the Contention Basin and is expected to reduce consumption by 20,000 m³/year (USD5,000 per year).

The potable water project consists of a comprehensive set of actions, including individualizing the water measurements to the different buildings, replacing potable water with raw water in drainages, as well as for gardening and toilets, in addition to training programs. This project is already underway providing a reduction of 28,500 m³/year and USD100,000 per year.

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 with key vendors in order to ensure that the waste management standards of vendors are in-line with our sustainable practices.

Various new waste reduction, recycling and recovery initiatives were successfully implemented in 2018 in order to reduce waste intensity, especially in regards to hazardous waste. In 2018, the total amount of reused, recycled and recovered waste was 57% of total waste, increasing by 5.3% from 2017.

Hazardous waste intensity improved to 0.0045 tons/ton of production in 2018 from 0.0054 tons/ton of production with a reduction of 16.67% compared to the previous year. We are working to further reduce both hazardous and non-hazardous waste and are aiming to achieve zero hazardous waste to landfill.

2018 Target:

Reduce or maintain the hazardous waste intensity from the previous year

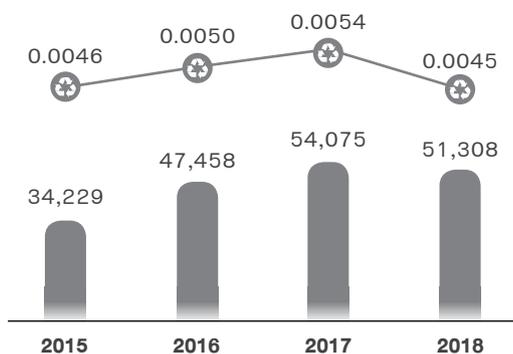
2018 Achievement:

Hazardous waste intensity reduced to 0.0045 from 0.0054 in 2017

2019 Target:

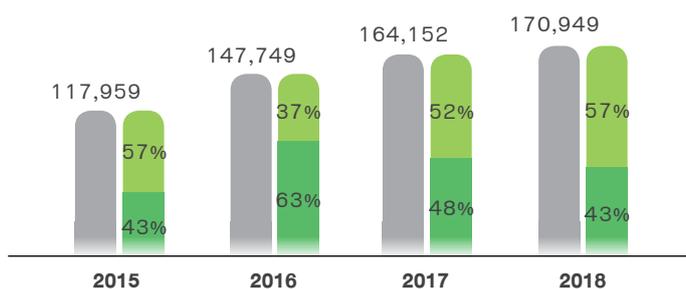
Reduce or maintain the hazardous waste intensity from the previous year

Total Hazardous Waste



- Total hazardous waste (Tons)
- Intensity (Tons/Ton of production)

Total Waste Generated, Disposed of, Reused, Recycled and Recovered



- Total Waste Generated (Tons)
- Total Waste Disposed (% of Total Waste generated)
- Total Reused, Recycled and Recovered Waste (% of Total Waste generated)

Other Air Emissions

We monitored the following emissions emitted in the environment in 2018 and in previous years:



LP Absorber Modification

In TPT Petrochemicals, the LP Absorber system handles acetic acid and other organics that are released in the manufacturing process of crude terephthalic acid from the oxidation of PX. As a result, the tower receives a large VOC load, which is then scrubbed by acid and water streams to ensure its vent has less VOCs. The tower vent is included in TPT's EIA and has a limit on PX concentration. A project was successfully implemented that modified the acid and water sections of the tower to improve their respective scrubbing mass transfer efficiencies. The solvent

loop in the plant was rearranged to enable more concentrate solvents to flow leading to a reduction in load in the top section. Pipework changes were carried out in the plant, which enabled circulation of a more concentrated stream of acetic acid thereby increasing the mass transfer. The project was completed and put into service in June 2018. A third party agency measured the VOC (PX) in the stack on a quarterly basis and the vent analysis showed a reduction of over 50% in Paraxylene, and going forward, will contribute to lower consumption of raw materials including PX.



Industry 4.0 – IVL’s Perspective



Over the last years, Industry 4.0 has rapidly gained prominence and is becoming an integral part of the manufacturing processes. With further advances in development of sensors and improved connectivity the manufacturing will become even more integrated with the Internet of Things, with the ultimate aim of improving productivity & quality consistency. The infinite potential extends to the fields of artificial intelligence, big data, machine learning, robotics, and virtual and augmented reality.

As a large, diversified manufacturing company with a global presence, IVL has consistently been prepared for change, understood the implications of technological advancements, been focused on operational excellence across our entire manufacturing spectrum, and consistently achieved best in class performance.

IVL is aggressively embracing developments in the technology to leverage the current manufacturing systems and practices in pursuit of achieving our vision to be a leading world-class chemical company.

We are currently implementing various projects in the following areas using Industry 4.0 framework:

- 1) **Digitalization** initiative in collaboration with industry experts.
- 2) **Energy Management** to reduce energy use by adopting an improved energy management information system and new technologies.
- 3) **Reliability Improvement** using the modern development in sensing technology.
- 4) **Use of Robotics/Automation** to enhance productivity.
- 5) **Utilizing Machine learning** to optimize various processes and improve productivity.



INSIDE EVERY PRODUCT, THE POTENTIAL TO IMPROVE THE WORLD.

At IVL, we never stop asking
just how far chemicals can take us.

Because as a global force in sustainable materials, we believe that inside the products that touch our lives every day, there's an even greater potential to make our lives safer. More comfortable. More fulfilling. And kinder to the world we all share.



INDORAMA
VENTURES

> Empowering potential.

CHEMICALS | POLYMERS | FIBERS

Product Stewardship

Our efforts are aligned with the following SDGs :



Product Stewardship plays an important role in IVL operations by reducing any adverse environmental, health, and safety impacts of our products. While our products are not harmful, we are always seeking ways to lower the environmental impact and toxicity in our raw materials and other chemicals. Product Stewardship encourages innovation in our products and processes to meet increasing societal and business expectations and to generate value by identifying opportunities to reduce resource and material consumption through Life Cycle Assessments (LCA) of our products throughout the value chain.

IVL's Product Stewardship encompasses three sets of procedures—product safety, raw materials, and eco-impact. It enables us to identify product stages to further improve their design, manufacture, raw materials, transportation, and value chain to lower their ultimate impact on the environment. This also applies to our operations and our value chain, both upstream and downstream.



Product Eco-Design Criteria

Our product eco-design criteria includes environmental impacts connected with the procurement of raw materials, product manufacturing, product use and product maintenance as well as minimization of hazardous materials, enabling use of recycled feedstocks and support for our customers' initiatives in weight reduction.

We are in the process of classifying our products based on various criteria including renewable resources, toxicity, energy sources, and social factors. This process enables us to:

- Identify low carbon products
- Categorize products that meet the needs of the marketplace in a manner consistent with sustainable development
- Prioritize products which reduce health and environmental impacts as compared to other products used for the same purpose
- Classify products whose eco-profile can be improved
- Communicate the sustainability characteristics that downstream customers and consumers increasingly care about
- Utilize LCAs as a design and communication tool and set the foundation for full life cycle management (LCM) at IVL
- Facilitate collaboration with stakeholders

We are aiming to complete this classification during 2020

Renewable Resources

IVL supports renewable resources, such as raw materials or energy, as integral part of its sustainability strategy. We have been increasing our use of renewable resources, including bio-based raw materials such as cellulose from sustainably cultivated plantations, Poly Lactic Acid (PLA), and Bio-MEG.



Recognition for Excellence in Packaging Design

Poly Clear® EBM PET 5507 is a high performance recyclable PET resin. This innovative product was designed to reduce environmental impacts by reducing packaging weight and encouraging increased recyclability while achieving high quality aesthetics and product robustness. Its eco-friendly packaging carries the No.1 recycling symbol. This product won many awards in 2018 due to its excellent performance and sustainable packaging design.



Best Design and Sustainability Award
from The Association of Plastic Recyclers, Europe



Sustainable Packaging Design Excellence
from The Institute of Packaging Professionals, USA



World Packaging Award
Beverage Award:
Best Design and Sustainability
from The World Packaging
Organization, Austria



Bio-MEG and Bio-PET are playing important roles in the Bio-Economy

IVL produces Bio-PET using Bio-MEG made from sugarcane to serve some of our customers. Bio-based content reduces greenhouse gas emissions and also reduces dependency on fossil fuel-based resources.

IVL produced 50,304 tons of Bio-PET in 2018, equivalent to 9% of global Bio-PET production. This lowers greenhouse gas emissions, energy consumption, and depletion of fossil fuels in its value chain.

“Product Stewardship and Innovation Management include an inter-related set of business activities, policies & procedures, and organizational designs.”

Life Cycle Assessment (LCA)

We completed LCAs of 65% of our total production in Asia and some plants in the United States and Europe in accordance with ISO14040 / 44:2006. We plan to extend LCAs to the rest of our operations in 2019 with completion expected in 2020 covering over 95% of production volume.

It is the proactive and systematic management of information gained through the LCAs that improves decision-making for product design and development. This is the basis of our life cycle management process.

2020 Target:
95% of global LCA coverage

2018 Achievement:
65% of global LCA coverage



For More
Information

Product Toxicity

While our products are not harmful and compliant with all relevant regulations, we are always seeking ways to lower the potential environmental impact and toxicity of the raw materials and other chemicals used in our processes. We stringently monitor our raw materials, and any potential issue that is discovered is actively replaced with known, registered materials or with alternatives that are safe based on their chemistry. We evaluate chemicals used in our operations and their exposure to our employees and the environment, and have effective control of volatile substances on the SVHC list and SIN list that may present a risk.

We take a proactive approach, actively engaging in assessments and ensuring that we meet the European Union's REACH regulations and other compliance requirements.

We comply with the ECHA SVHC list and are proactively removing products on the SIN list. It should be noted that IVL is not listed as a manufacturer of chemicals on the SIN list.

Our goal is to complete the comprehensive assessment of our raw materials, chemicals, and products during 2020 regarding the SIN list and to set a target for improvements by 2021. 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.

“IVL is targeting zero violations against domestic and international regulations as well as zero use of any substance of very high concern (SVHC).”

2018 Target:

- *Achieve 100% compliance in EU of the European Union's REACH regulations by 2018.*

2018 Achievements:

- *100% of our European entities are compliant with the EU's REACH regulations.*
- *100% of imported chemicals to the EU are compliant with their REACH regulations.*

2019 Targets:

- *Comprehensive assessment of our raw materials, chemicals and products focusing on classification with SVHC, SIN lists.*
- *Set target for improvements.*



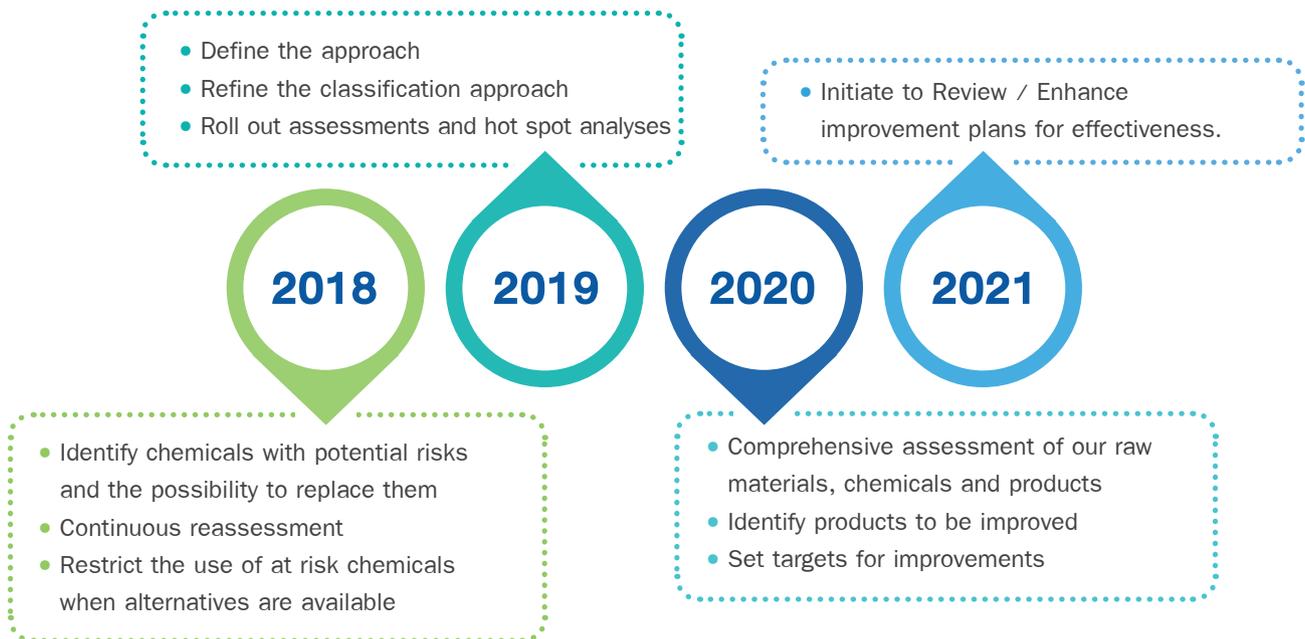
Safe and eco-friendly textiles

Our ECORAMA™ Staple Fiber product line at our wholly-owned subsidiary, Auriga Polymers Inc., has received SCS Global Services Recycled Content Certification. This certification measures the percentage of recycled content for the purpose of making an accurate claim in the marketplace. It demonstrates our commitment to conserving natural resources, helping to meet customer specifications, qualifying products for Leadership in Energy and Environmental Design (LEED) and environmentally preferable purchasing (EPP) programs, and supports our sustainability goals.



Management of Hazardous Chemicals / Substances

Commitment: To Identify products and set target for improvement by phasing out at risk chemicals



Phasing out color control based on cobalt acetate

IVL's products do not have toxicity concerns. In fact, many are intended for food and/or skin-contact. However, there are emerging concerns with some chemistries despite being approved for intended applications.

With this in mind, Auriga Polymers Inc. has already begun phasing out color control based on cobalt acetate chemistry. The current timeline, allowing for customer qualification, has the conversion to approved organic dyes occurring by May 2020.



Recycling

Plastic, especially PET, is a unique material with many benefits such as low cost, versatility, lightweight, resilience and recyclability. While it has several economic, environmental and social benefits, its mismanagement after use – leading to landfill and ocean littering – is causing global concern. The focus on plastic pollution has been at the forefront of the society, regulators, industry groups and consumers.

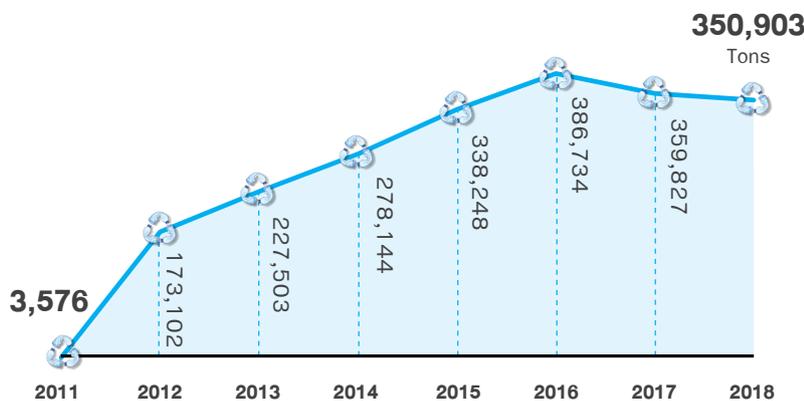
While the issue of plastic pollution has become a major emerging risk and ecological concern for the industry, it also presents a significant opportunity especially after China took a bold step to ban imports of plastic waste in a move to protect its environment. This, in addition to helping boost demand for virgin PET and feedstock materials locally, has also acted as a catalyst for companies around the world to seek

better alternatives, change consumer behavior, and give rise to more effective recycling. Exporters are likely to be forced to expand domestic recycling infrastructure as well as cut the levels of waste being produced. Further, the life-cycle benefit of PET is well established, and improved waste collection rates will mean an increase in recycling rates worldwide. PET will continue in its tradition at the forefront of the recycling of plastic waste, bearing the standard for circular processing business models.

IVL has been active in PET recycling and is a leading recycler in Europe, North America and Asia. It has been continuously exploring the opportunities to increase recycled product offerings, expanding the business from 4 tons in 2011 to over 350,000 tons in 2018.

rPET Resin Production 2011–2018

* rPET resin that contains up to 30% recycled content



**Around
38 billion bottles
are recycled
from 2011–2018**



Our Commitment:

The PET produced by IVL is 100% recyclable. As part of our recycling efforts, we have made a global commitment to incorporate 750,000 tons of post-consumer PET materials as feedstock into our polyester production by 2025. The commitment is just a start of the journey, generating the value of the collected PET and promoting less plastic left in the environment.



In 2018, the company engaged with legislators directly and through trade associations to revitalize the business for PET resin, the polymer of choice for beverage bottles globally. Having worked with the Ellen MacArthur Foundation from very early on, IVL is involved in the New Plastics Economy Global Commitment in collaboration with the United Nations Environment Program towards a vision of a circular economy for sustainable plastics.

In Europe, IVL has maintained strong engagement with the Committee of PET Manufacturers Europe focusing on the health & safety aspects of virgin and recycled materials. In 2018, IVL joined EUROPEN, an organization focused on the European packaging business and its impact on the environment. By this collaboration along the value chain IVL has played a major role in the arena of legislation and health and safety.

In the US, IVL actively participates in organizations such as the National Association for PET Container Resources and the Association of Plastics Recyclers, utilizing its APR Design® Guide for Plastics Recyclability.

In Thailand, IVL is collaborating closely with key customers, suppliers and industry associations notably on efforts to persuade the Thai government to amend a current law banning the use of recycled PET to produce new packaging. This process allows all parties to learn more about the need to recycle and to see the circular economy as an important way to reduce waste.

From three North American locations, IVL supplies single-pellet solutions comprising up to 30% PCR content. In parallel with these recycling efforts, IVL acquired reclaimers in France and the US to supply clean, clear PET flakes. The purchases of Sorepla (now Wellman Neufchateau) in 2018 and Custom Polymers (now Indorama Ventures Sustainable Solutions) in early 2019 places IVL in a leading position to offer 100% rPET solutions for food-grade applications by offering product differentiation through multiple market segments.

To complement mechanical and chemical recycling, Auriga Polymers Inc. utilizes a site-based extruder to manufacture fiber with up to 100% Post-Consumer Recycled content.

Over the past two years, Indorama Ventures has also undertaken two chemical recycling initiatives with selected partners. Chemical recycling allows for the “upcycling” of lower-quality post-consumer PET to virgin-grade resin. Through a collaboration in Europe, in 2019 it is envisaged that IVL will take reclaimed monomers generated by the innovative company IONIQA to combine with traditional feedstock to make virgin-grade PET with recycle content. This will exhibit the circularity of PET by generating new from post-consumer waste. A joint venture with Loop Industries will also break down PET polymer from post-consumer waste and make new 100% virgin-grade PET from 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 position in creating the future.

“PET – Recycling – The renaissance to reduce PET plastic waste going to nature, and preserve natural resources.”



For More
Information



Social



We are making every effort

to be an incident and injury-free company

Health, Safety and Well-Being

Our efforts are aligned with the following SDGs :



Health, safety and well-being are our core values. We place the health and safety of our workforce at the forefront of our activities and continuously implement programs for improvements. Both occupational health and safety, including process safety, are extremely important to IVL. 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, even going beyond the provisions required by law. This enhances our appeal as an employer of choice, promotes employee satisfaction and productivity, and ensures we continue to attract and retain a talented workforce.

Health and Safety Management System and Risk Assessments

IVL complies with local laws and regulations in providing a safe work environment, and had OHSAS 18001/ISO 45001 (Occupational Health and Safety Management System) certifications at over 48% of our sites as of December 2018. We set a target to extend this certification to 98% of our sites by 2020 (excluding sites which are less than two years old in IVL Group).

In 2018, we continued to invest in occupational health and safety training for all our employees. Over 192,000 hours of Health and Safety training were given to our employees and contractors compared with over 159,000 hours of training in 2017. This investment has resulted in the improved health and safety of our workforce through increased awareness and a higher near-miss incident reporting rate of 1,870 incidents in 2018, which increased from 959 in 2017. However, total recordable injuries and lost time injuries increased in 2018 from 2017 due to higher injury rates in our newly acquired plants, which are more labor intensive. We are taking measures to reduce the injury rates. Conversely,



IVL's Lost Time Injury in 2018 declined to 1.29 compared with 1.57 in 2015. This can be attributed in part to the improved effectiveness of our occupational health and safety programs, especially training in employee safety behavior.

We are making every effort to be an incident and injury-free company, and are grateful that 27 of our sites attained the goal of "zero accidents" in 2018.



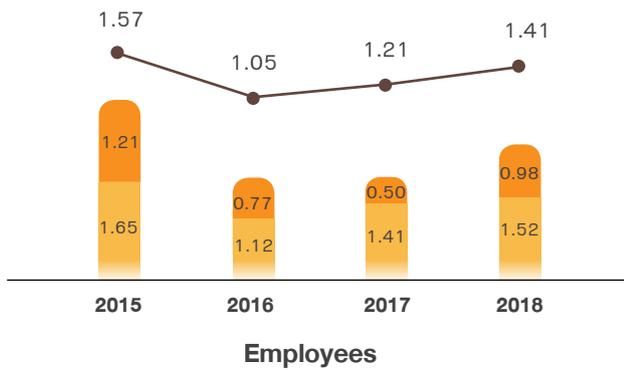
Total Recordable Injury Rate : TRIR (Cases/200,000 man-hours)



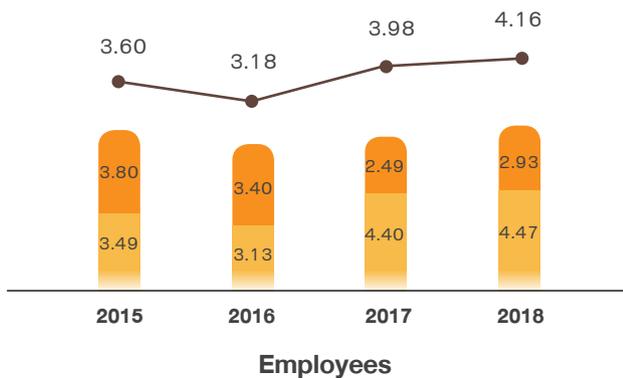
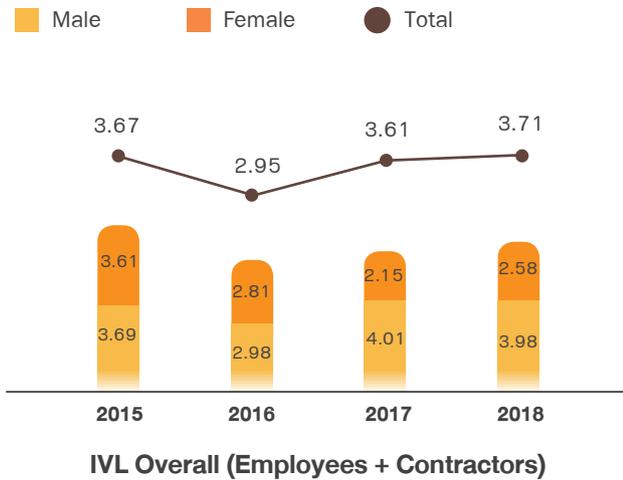
2018 Target:
2% reduction in TRIR from the previous year

2018 Achievement:
TRIR = 1.29 cases/200,000 man-hours

2019 Target:
2% reduction in TRIR from the previous year



Lost Time Injury Frequency Rate : LTIFR (Cases/1,000,000 man-hours)



2018 Target:
2% reduction in LTIFR from the previous year

2018 Achievement:
LTIFR = 3.71 cases/1,000,000 man-hours

2019 Target:
2% reduction in LTIFR from the previous year



Fatal Accidents

There were no fatal accidents in 2018. This is the result of several health and safety programs that have been conducted at many of our sites globally including compulsory and occasional health and safety training programs. However, as part of our health and safety policy and guidelines, we undertake an in-depth investigation of any accident that occurs and appropriate interventions are subsequently implemented.

Furthermore, knowledge sharing of lessons learned, post-incident safety measures undertaken including improving risk management practices, strengthening behavioral safety initiatives as well as the initiation of disciplinary action against those concerned shall be communicated to all entities in the group.



Wellman International, Ireland, our wholly owned subsidiary, organized Health and Safety Risk Review Workshops. A summary of the risk review workshops from 2016 - 2018 was displayed for employees to review. The summary outlined the main workplace hazards in key areas and suggestions for improvements that were identified. The workshops were completed using Six Sigma tools with Operators & Craft Personnel to develop new health and safety improvement ideas as well as further developing our health and safety culture and ownership.



2018 Target: Zero Fatalities
2018 Achievement: Zero Fatalities
2019 Target: Zero Fatalities

Wellness at Work

We care about our employees and make every effort to ensure a healthy work-life balance without compromising on productivity or efficiency. A total of 82% of our employees are involved in joint management-worker health and safety management committees at our plants. Guidelines are in place for the security of personnel and properties. The promotion of good health, safety and wellness are addressed through the respective 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 the rise 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.



82% of our employees are represented in formal joint management – worker health and safety committees

51.3% of our employees covered by collective bargain agreements



For More Information



Mental Health Seminars

Wellman International, Ireland our wholly owned subsidiary, arranged a series of talks on health and well-being for interested employees, inviting former Ireland international rugby player Alan Quinlan. Practical solutions for managing mental health were highlighted, as was the fact that mental health issues are a challenge that is more common than people may realize.

Healthy Living

Dieticians from our catering partner Aramark were available in the canteen at Wellman for two days during Health & Safety Week. Employees were able to meet and discuss general health and diet related concerns with the dieticians.

Cycle to Work Scheme

Wellman started supporting “Cycle to Work.” As part of this drive, it invited a local bicycle and cycling equipment specialist, who visited Wellman Ireland on October 24–25, 2018 and provided advice to employees on different types of bicycles and bicycle gear. They also displayed a range of bicycles for employees to review and also provided information on the Irish “Cycle to Work” grant scheme.

“Providing a safe and healthy workplace not only boosts the morale of employees and contractors, it also reduces lost hours and costs, and minimizes illness and potential injuries.”

Process Safety

We ensure the safety of our workforce, including process safety in our value chain, through efficient operational management. We are committed to achieving the highest safety standards in the design and construction of new plants, equipment, and the operations of 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 are rare but can have a major impact on our employees and the environment. We continually improve occupational health and safety performance by adapting ISO 45001 standards and Process Safety Management (PSM) principles.

The cases of Tier 1 Process Safety events in 2018 were related to the accidental release of materials from containment. The cases had no impact on the environment. The areas where the accidents took place were secured and the releases were immediately contained.

Process Safety Tier 1

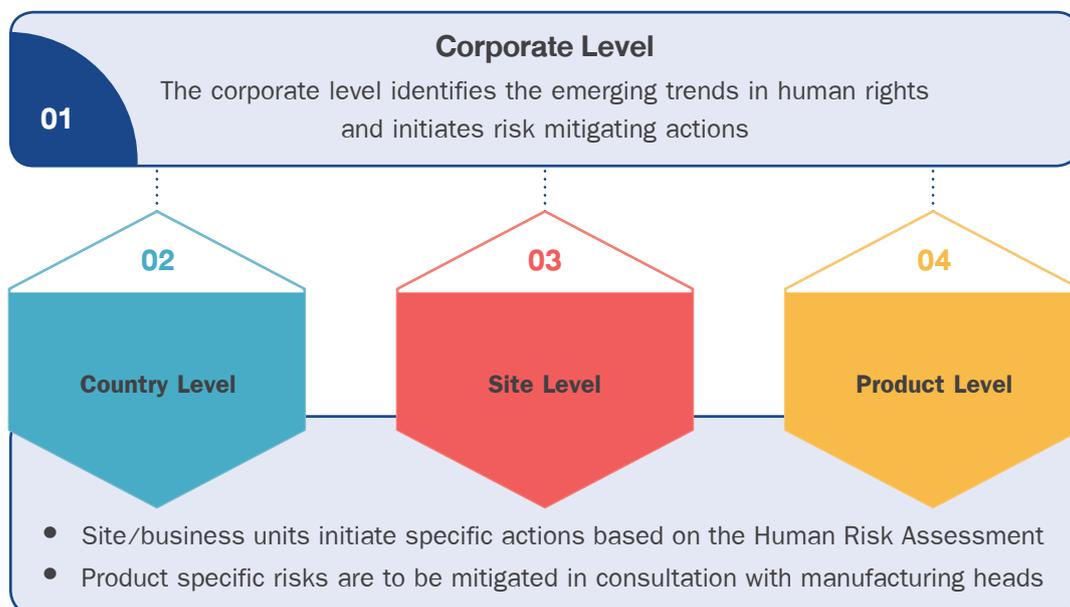


Year	Rate (Case/1,000,000 man-hours)
2018	0.43
2017	0.48
2016	0
2015	0

Workplace Human Rights Assessment (WHRA)

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 following stakeholders for our operations including joint ventures:

1. Own employees
2. Children
3. Indigenous people
4. Migrant labor
5. Third-party contracted labor
6. Local communities



The WHRA framework embodies a three-stage assessment process called IACM—Identify, Assess, Communicate and Mitigate. The WHRA online survey tool, which IVL started using in 2016, continues to play pivotal role in this three-stage assessment process.

It also encompasses five vulnerable groups within IVL's operations including joint ventures: national minorities; people with disabilities; senior citizens; people with HIV; and the LGBT community.

The outcome of this assessment process for 2018 is as follows:



*HRRP = Number of potential human rights risk identified / (Responses from total units * total questions)

Major areas of improvement and mitigating actions were identified:

Main issues		Remedial Actions	
		Corporate Level	Country / Site Level
Working hours	Infrequent overtime	<ul style="list-style-type: none"> Overtime standards Feedback and advice 	<ul style="list-style-type: none"> Changing the shift schedule plans Having an appropriate “Reserve Bench” to manage shift absenteeism
Personal data privacy	Respecting and maintaining personal data privacy	<ul style="list-style-type: none"> Binding corporate rules with units to respect personal data privacy Making the Corporate Human Resource Information System’s personal data privacy compliant 	<ul style="list-style-type: none"> Training for HR colleagues on emerging trends in personal data privacy

Major areas of improvement

No risks were observed for the five vulnerable groups. We will continue with our three stage assessment approach to ensure that any assessment needs are evaluated on a regular basis taking into account Indorama ventures unique risk profile and operating context.

In 2018, there were no operations and key raw materials and non-raw material suppliers at risk for incidents of child, forced and compulsory labor.



For More Information

Unlocking our Human Capital

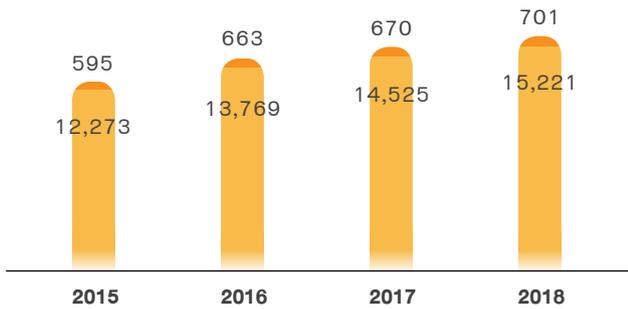
IVL's growth speaks volumes about the passion and commitment of our people. At a time of sweeping change in the industry and an increasing push for more sustainable products, we want to emphasize our focus on human capital that helps our employees succeed, which in turn, helps us to achieve continued growth and innovation. While we continue on our journey by unlocking our human capital with our i-Lead, v-Lead, Shadow Talent Development, and Lean Six Sigma programs, we also introduced the roles of Chief Strategy

Officer and Chief Human Resources Officer, and successfully filled both management positions. We will be advancing our renewed human capital strategies by having an absolute focus on being a more agile organization with clear accountability, performance and ownership. We are also committed to sustainably building IVL's growth culture where employees are inquisitive, inclusive, engaged, and become ambassadors of a great place to work.

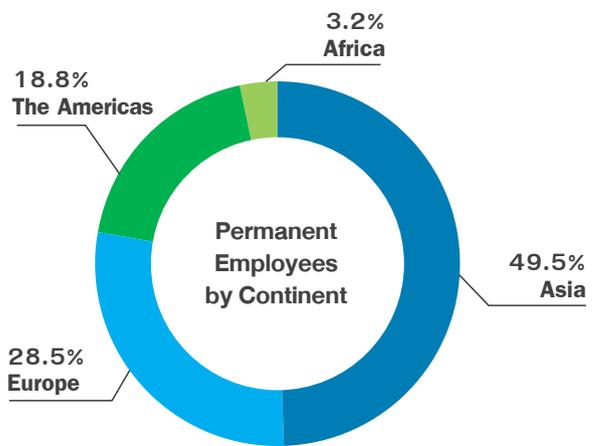
Global Workforce

The headcount of our global workforce is 15,922 which includes 701 temporary employees. Highlights of our global workforce are noted below:

Workforce Trends



■ Total Permanent employees ■ Total Temporary employees



A Diverse and Inclusive Workforce

At Indorama Ventures, diversity is not only about culture, language, age, gender, nationality, and geographic backgrounds but also different ways of thinking and having an open mindset. We value that our diverse and inclusive workforce is a competitive advantage. Our diversity and inclusion efforts start with the recruitment of candidates, career management, learning

and development, and promotion and rewards for all employees including those with disabilities. We offer them a career suited to their skills and experiences so that they can contribute value to the Company and be a part of our growth over the long-term. Some of our diversity indicators are as follows:

Gender Diversity



21.53%
Women

Nationalities

74



Employees with Disabilities



88

Age Diversity

18.85%

59.29%

21.86%

< 30 years old

30-50 years old

> 50 years old

Our Diversity Policy, available on [our website](#), is translated into different languages and is further communicated to employees across all of IVL's locations. Diversity practices are further reinforced across the employee lifecycle processes.

Talent Attraction and Retention

Talent needs resulting from retirement, attrition and future strategic needs are well-embedded with our talent attraction, retention and succession planning programs. In 2018, 1,758 successful employees joined the Company, of which 30.83% were women.

Continent	Male		Female		Total	
	Number	%	Number	%	Number	%
Asia	655	37.3%	392	22.3%	1,047	59.6%
Europe	280	15.9%	69	3.9%	349	19.9%
The Americas	233	13.3%	80	4.6%	313	17.8%
Africa	48	2.7%	1	0.1%	49	2.8%
Total	1,216	69.2%	542	30.8%	1,758	100.0%

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.

While our global and regional employee referral program is pivotal in recruiting staff, we also used other platforms such as Campus Connect and LinkedIn to reach potential candidates. Some major initiatives that have driven efficiencies in the potential talent pipeline are:

1. In regions like the US, the retirement backfill plan is underpinned by collaborating with local colleges through a Co-op program. The Business Units (BU)

work with students on a roughly four months on / four months off rotation. With this program, each site can work with 2-3 potential engineers each year. In 2017, the BUs in the US started the first wave of college hires and began training, mentoring, and developing them for future roles. This was the beginning of the talent pipeline, and we are working hard to ensure that this cohort and those we continue to hire, progress in a manner that will ensure the future stability of our talent needs.

2. In Thailand, we continued our collaboration with top universities participating in Campus Connect programs. The objective is to provide internships to promising students giving them the opportunity to experience a real work environment. In 2018, 16 paid interns from the country's top universities completed the live projects report and returned to their universities to continue their formal education. Job offers will be given to these prospective employees once their education is completed.

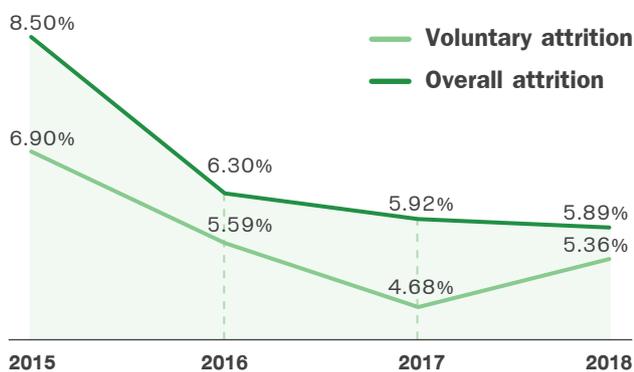
1. **Global Collaborative Platform:** Setting up the Global Collaborative Platform to share the best retention interventions prevailing across BUs was a major enabler in understanding the retention levers in different regions / countries. BUs in those region / countries were further encouraged to collaborate in developing specific and localized interventions.

2. **Career Growth Opportunities:** For BUs in the EU and US, a retirement plan is carried out to program retirements in the upcoming years. In such cases, the department and employee have an opportunity to react in time to make a planned succession. Initially, the successor is searched from the pool of internal candidates. The identified successor is put through a structured knowledge sharing process. If no internal candidates are found, an external search is conducted to find candidates and cover future vacancies. The intern / Co-op program ensures a sufficient talent pool at the bottom of the pyramid.

3. **Work Environment:** In some of the BUs, factor analysis revealed a high correlation with safety related aspects. To address this, these units embarked on Behavior-Based Safety (BBS) training which is given to all concerned employees, including from contractors. Employees at operating levels are requested to submit at least one BBS observation card on a monthly basis for the sake of safety for all; other employees at managerial levels are also requested to submit a minimum of two BBS observations every quarter and all department heads need to submit at least one BBS observation every quarter. All BBS observations are taken into consideration to find room for improvements.

Over 94% Retention Rate

We gather insights from labor market scenarios, strategy meet sessions, the Global Employee Engagement survey, and focus group discussions, and then calibrate the employee lifecycle processes. This calibration is underpinned by data analytics to identify the levers of talent retention.



With a shift of - 0.03%, our overall attrition rate is 5.89%. A focus on data analytics is proving to be a game changer in identifying hot-spots. Once identified, retention interventions are developed by understanding the BU's specific needs. Some of the major initiatives and examples that enabled our retention of talent are noted below:



Workforce Engagement



In the 2018 GEE survey was made available in 19 languages where 93.43% of permanent employees participated. The 0.29 point basis shift in the overall engagement score shows that we are on track to exploring and establishing ways to engage our workforce in a more meaningful way.

Some of the initiatives taken to sustain and improve employee engagement are noted below:

Employee Engagement Score			
2015	2016	2017	2018
85.92%	86.02%	90.68%	90.97%

2018 Target:
Better than or equal the employee engagement score to previous year

2018 Achievement:
Employee engagement score = 3.85

2019 Target:
Better than or equal the employee engagement score to previous year

1. Project “Fresh Eyes”: Under the regional leadership team, the site heads take a holistic view of issues starting with the gap in EBITDA and systematically work through the causes using the Define, Measure, Analyse, Improve, Control (DMAIC) approach to solving problems. This team visits each site to learn best practices, challenge the culture, and solve problems. The expectation is that the team will collaboratively develop an excellence action plan.

2. Project: What makes a manager: Units with low engagement scores on people manager capabilities started by improving leadership skills, especially of front-line leaders, by understanding the characteristics of higher performance teams. An emphasis is placed on making these front-line leaders conscious of the different aspects of high performing teams such as communication across different levels of the organization, tools to build trust, commitment, respect within the team, the importance of why-how to gain alignment and motivate your team, and the importance of discipline and personal accountability.

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.



3. Award for Excellence: The Award for Excellence inspires our employees to challenge all boundaries and produce outstanding results. Started in 2017, this award is based on stellar performance across 10 criteria which are based on Financial

Performance, Operational Performance and Sustainability Criteria Performance. The best BUs are identified by benchmarking the performance across these criteria, and are awarded at the Global Strategy Meet.



Feedstock Business

PT Indorama Petrochemicals, Indonesia



Fibers Business

PT Indorama Ventures Indonesia, Indonesia



PET Business

Guangdong IVL PET Polymer Company Limited, China



Packaging Business

Indorama Ventures Packaging (Philippines) Corporation, Batino, the Philippines



For More Information

Learning & Development Highlights

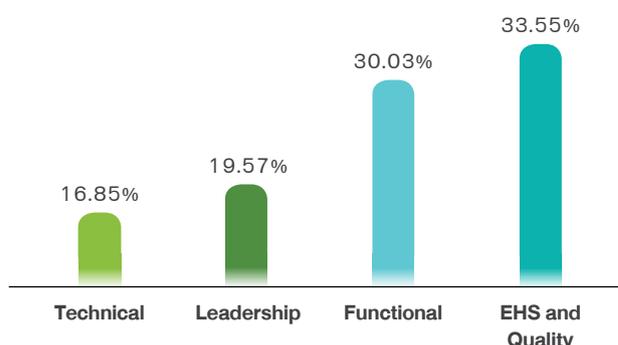
- » 30.43 training hours per employee. Shift of +34.05%
- » 88.16% training coverage. Shift of +7.26%
- » 463,175 hours of training. Shift of +40.45%
- » 38 participants for the i-Lead leadership development program to develop the next-generation of leaders.
- » 27 participants for the v-Lead leadership development program to develop cross-functional expertise.
- » 18 high potential managers went through the “Shadow Development” program meant to develop local talent.
- » 1,376 employees attended the Global Lean Sigma (LSS) program and undertook 252 projects. Over 43,920 Six Sigma training hours were completed from 2012 to 2018 yielding over USD 32 million in savings.

The extraordinary people who make up IVL are—and always have been—our most valuable asset. We are committed to investing in our people through valuable training and experiential learning that enables them to be skilled in the essentials of leadership and business. Apart from global programs such as i-lead, v-Lead and Shadow Development, the specific programs at each BU cater to the specific developmental needs of employees based on performance discussions with the line manager.

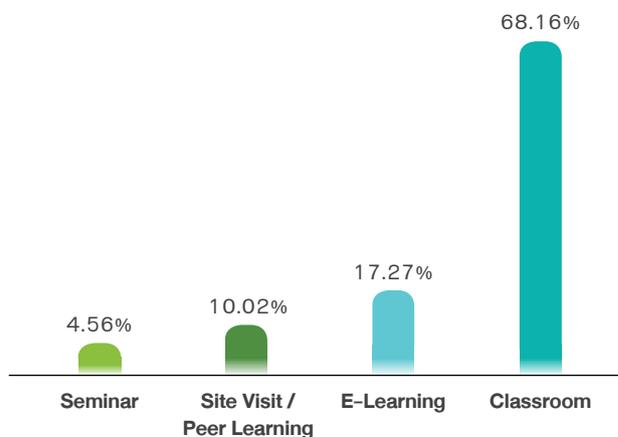
Average training hours (Hours/Employee)

2015	2016	2017	2018
15.2	20.7	22.7	30.43

Learning Themes



Learning Formats



We invested USD 173.60 per employee in a range of learning themes: Environment, health, safety, quality, function, technical, communication skills and leadership development. Blended-learning was a priority area and was provided in learning formats such as classrooms, e-learning, seminars, site visits, and peer learning. Some examples of blended-learning are noted below:

1. **Intervention based learning:** This project-based learning was created to provide the next generation with the necessary leadership and business skills. Participants not only learned from subject matter experts in relevant domains but they also applied what they learned in real business situations through special project assignments and presentations.

2. On-Line Learning Module: This year, we began our collaboration with edX, a massive open online course (MOOC) platform to provide access to high-quality education by top instructors from the world's premium universities and educational institutions. With the help of subject matter experts, 250 programs on assorted topics were made available to employees based on specific functional needs.

3. In-Line Learning Platform: This platform was offered to employees to hone their communication and presentation skills in a collaborative way. To improve their public speaking skills, we joined with Toastmasters by having toastmasters clubs at the BU level. A global webinar platform was made available to the subject master experts to share the best selected training programs of the BU.

The following are some of the highlights of the major initiatives in 2018:

Development Programs	Program Objectives / Led By	Outcomes Of The Development Programs
1. I-Lead	<ul style="list-style-type: none"> to identify and groom next generation global leaders led by the Group CEO 	<ul style="list-style-type: none"> 38 high potential executives across the region were developed, coached, and mentored
2. Lean Six Sigma	<ul style="list-style-type: none"> to streamline processes which resulted in efficient services and quality products at optimum cost led by global operational excellence champions 	<ul style="list-style-type: none"> 1,376 employees attended LSS programs and undertook 252 projects up to now USD 32 million in savings for the Company since 2012
3. V-Lead	<ul style="list-style-type: none"> to develop a leadership pipeline in respective businesses led by Business Heads 	<ul style="list-style-type: none"> 27 young talented managers were trained to become effective leaders
4. Shadow Development	<ul style="list-style-type: none"> to develop local talent who can replace senior leadership led by local HR representatives 	<ul style="list-style-type: none"> 18 high potential managers went through the nine month development program
5. Global Benchmarked	<ul style="list-style-type: none"> to share the best training program within the BUs, a "global webinar" platform was created in 2018 led by global HR and program originators 	<ul style="list-style-type: none"> 346 employees from respective departments went through two top training programs and shared their experiences with relevant employees in their BUs

Performance Management

IVL's performance appraisal systems are closely linked with the leadership development ecosystem. Management by objectives (MBO) continues to remain a catalyst for reviewing performance. This covers past performance, reasons for unmet targets, opportunities, threats and prioritization of items for the next cycle. Multi-source feedback also continues to remain one of the pivotal tools offering insights on calibration needed on leadership competencies. The outcome of these tools is used by the Talent Review Committee (TRC). In consultation with the NCCG Committee,

the Board 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 experiential learning, we will continue to invest in knowledge and on-the-job training, as well as providing opportunities for employees to explore the different facets of experiential learning.

Corporate Social Responsibility

Our efforts are aligned with the following SDGs :



We strongly believe in the need to balance the interests of our business with the environment and society. Corporate Social Responsibility (CSR) is a key strategy in demonstrating the integrity of our business. Our actions demonstrate the positive effect we have as a company on society and the environment, which in turn, is vital to achieving sustainability.

IVL can achieve long-term sustainable growth by focusing on the benefits we provide to the people and communities where we operate. Our group-wide strategy

and philanthropy aims to support and develop local communities by creating value for all of our stakeholders. IVL’s Corporate Social Responsibility themes are focused on creating value for both the company and society, and are aligned with the United Nations Sustainable Development Goals (SDGs).

Through Creating Shared Value (CSV), we have adopted a business-driven approach globally which allows us to incorporate social responsibility in our business success and bring long-term shared value to our stakeholders and society. CSV is an essential way for us to balance our economic and social commitments in a meaningful way. By adopting CSV principles, we focus our efforts on CSR programs that are aligned with our business needs and knowledge while at the same time addressing social challenges and taking further steps to creating shared value across the entire value chain.



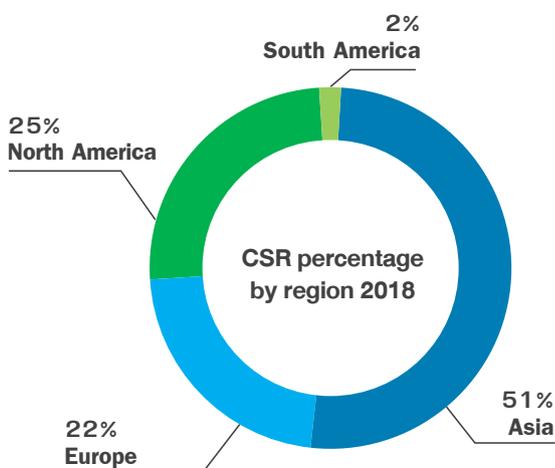
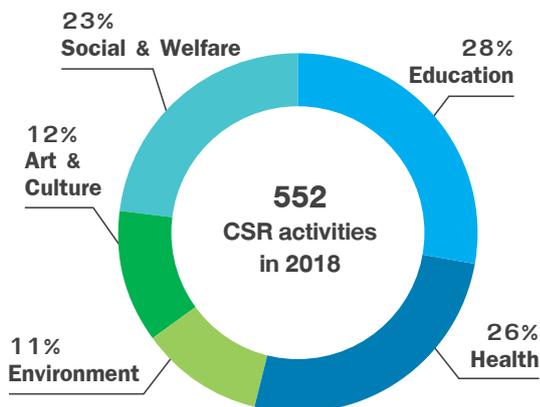
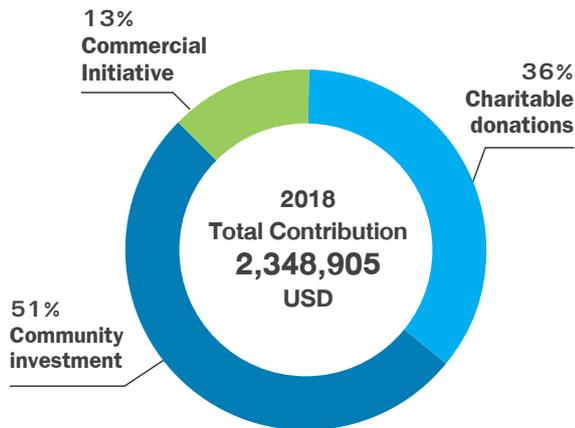
In 2018, IVL arranged 552 activities in support of our three key CSR themes, including few activities pertaining to arts and culture, in our communities, which we believe, are fundamental to human identity and dignity, and further helps build awareness and support our CSR strategy while allowing us to engage with a wide range of stakeholders.

Education

Education builds a successful foundation by providing an opportunity to accomplish great things, create better societies, strengthen our values and gives a sense of freedom for a better future and an enriched world. We recognize the growing demand for high-level skills and capabilities to serve Industry 4.0, especially the need for students who study science, technology, engineering and mathematics (STEM). A good education provides better career opportunities and improves the prosperity and quality of life of communities. We provide such learning opportunities and academic support to encourage interest in careers that are in demand currently, and fulfilling quality work force of the company.

We provided scholarships, internships, training, and career development for technical vocations, universities, colleges and people in the community by collaborating with schools, universities, and customers to provide and support education programs. Students, in turn, had opportunities to learn from IVL staff, visit IVL's operations to experience a real workplace and have the chance to take training courses.

In the United States, we sponsored a summer Welding & Electrical Technical Camp for girls giving them the chance to gain hands-on experience and learn technical skills that can lead to high paying and satisfying careers in high-growth industries.





RECO Program Sustainable and Upcycling Fashion Design from Post Consumer PET

The RECO Young Designer program, the largest upcycling design competition in Thailand, began in 2011. The fundamental principle of this program is that the designs must be made from at least 60% post-consumer PET and polyester materials. The top 30 selected entries attend an executive eco-design workshop led by professional designers.

The objective is to raise awareness about using PET and polyester waste and to create inspiring designs. The competition gives the competitors a chance to transition to a career as an eco-designer. The winner in 2018 joined Dutch Design Week in Eindhoven, the Netherlands.



Empowering Woman through Fashion Skills via Collaboration with Carcel Program



In addition, through the IVL Foundation, we supported women's empowerment by funding a high-end garment design training program at a Chiang Mai prison in collaboration with Carcel, a fashionable Danish clothing designer, and the Department of Justice. A select group of women involved in this project learned to apply nine sewing techniques, were assessed qualitatively and quantitatively based on their technical skills and development, as well as their style of work and motivation, and went on to apply a range of techniques in pattern-making,

sewing and embroidery. While each woman had an area she was specifically skilled in, they had the opportunity to develop in all fields. The skill-set allowed them to gain confidence in their abilities, while providing financial support in order to plan for when they are released, and to have the chance to integrate into society with useful and relevant skills, and to properly look after themselves and their families, ensuring the transition is smooth and that they have a positive impact on society.





Recycling Education Sustainable Consumption for Better Future

Recycling education is an important focus for IVL. Plastic waste has become a global concern and is increasingly critical to both marine and on-land environments. We are actively building and increasing public awareness and changes in behavior about waste disposal, waste management and the importance of recycling. We are increasing our recycling capacity to process recycled plastic waste and are collaborating with various groups of stakeholders on numerous campaigns and projects.

Our key target groups are students and schools as we believe a new generation can change the world and bring about a better future. Encouraging awareness among children and youth, and demonstrating how to separate waste correctly, especially plastic waste,

can solve problems from the outset, and any waste collected can be further recycled into a variety of useful products. It can also help to protect the environment, reduce energy use, and create jobs in the supply chain. This is truly the “Circular Economy” concept which we are working towards and have as one of our guiding principles. We have also had successful outcomes in recycling education. Our flagship Recycling Education program was initiated in Thailand and the United States, where more than 4,000 kids were educated helping communities to end littering and improve recycling through education and competitive programs. We also worked in partnership with our customers, regulatory bodies and other companies to promote awareness and collect PET for recycling at our plants.



We are doing more with our recycled waste by transforming them into value-added materials used to produce clothing. More than 2,500 of our shirts made from recycled bottles were given away to raise awareness of plastic waste and how it can be turned into useful products.

WASTE NOT WASTED!



THESE **SHIRTS** are made from **RECYCLED BOTTLES**

Join us to help save the world!

INDORAMA
VENTURES

We made yarns from recycled bottles since 2011

Environment

In addition to health and well-being, we want communities to thrive through improved work opportunities and an environment that supports wildlife and conservation. We are pleased to have supported and had a positive impact on organizations in addition to collaborating with partners who helped us achieve our aims over the past year.



Our IVXP Wildlife Habitat Cooperative efforts to create, conserve and restore wildlife habitats

In the United States, we partnered with the Wetlands Edge Environmental Center (WEEC) and Decatur City School in Decatur, Alabama. WEEC provides hands-on, environmental “place-based” educational opportunities across the K-16 curriculum to all who visit. The program’s goals are to create an understanding of the natural environment and the interrelationships among living things, to promote sound stewardship and management of natural sources, to create an awareness of global, national, and local environmental problems and foster sound decision-making regarding their solutions, and to enrich, vitalize, extend, complement and culminate all content of the K-12 school. In 2018, a total of 3,900 students from kindergarten to grade 12 visited WEEC and joined the program.



Indorama Ventures PCL and Bangchak Corporation PCL have worked together on supporting the recycling of used PET bottles. Collection points for PET bottles are set up at over 100 Bangchak gas stations around Bangkok and the Metropolitan area to encourage people to help keep the environment clean.



Eco-Brick : Building New Environmental Awareness

In the Philippines, we collaborated with the Local Government Unit of Villanueva on a project designed to raise awareness about plastic waste and environmental pollutants. The project used Eco bricks, made of about 10,000 PET bottles which we provided as construction materials, and were made into benches placed at the beach and to help enhance community spaces. By creating a new and intriguing ‘second use’ for each plastic bottle, ecobricks inspire people to reimagine plastic bottles as items that continue to endure long after their primary use has been fulfilled – and can be repurposed rather than just tossed away and forgotten. However, IVL create value addition to our PET waste to a high-performance construction material.



Health and well-being

We believe in strengthening communities by ensuring they have access to health awareness programs and community care facilities so they can remain vibrant and self-sustaining. A healthy and thriving community around our plants benefits everyone by increasing the happiness index, goodwill and providing a capable workforce for our operations.

This year, IVL helped through a number of initiatives, including:

- Arranging health education training courses for communities focused on adopting practices geared towards maintaining a healthy lifestyle and improved well-being.
- Providing a mobile medical clinic to communities for free health checks, including tests for breast and cervical cancer, dental check-ups, and vaccines for pets.

- Holding several staff fundraising campaigns in support of children, patients with breast cancer, hospital equipment purchases, and support for the underprivileged.
- Supporting foundations such as the Red Cross, Decatur Morgan Hospital Foundation, The United Way and Operation Smile Thailand. In 2018, we expanded the Operation Smile project to Myanmar where 138 patients received free operations.

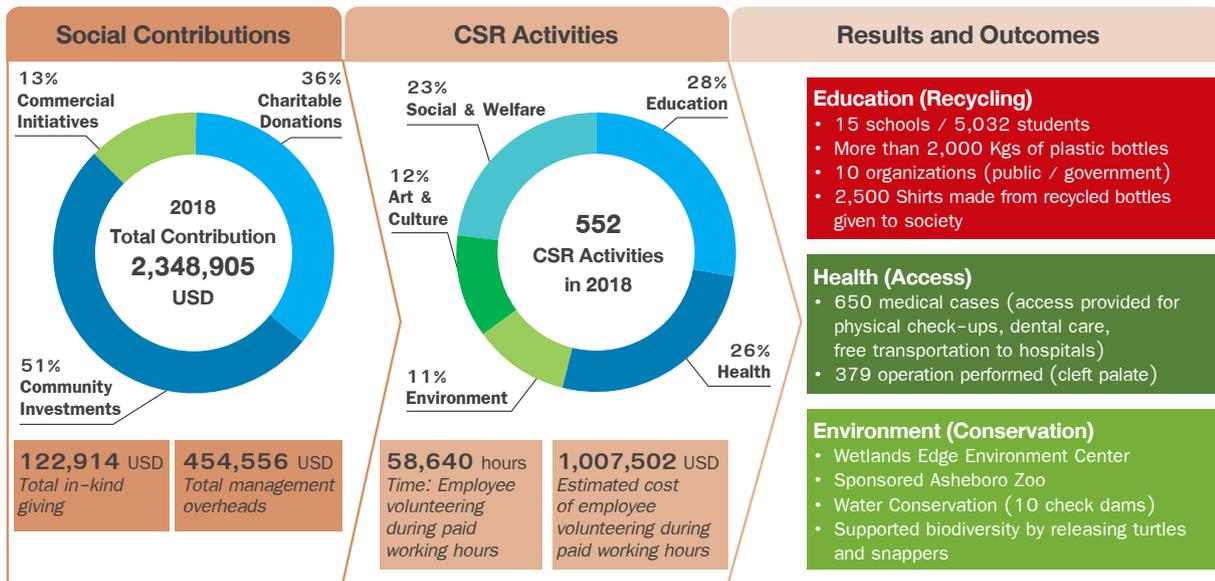


Bring back smiles for happier and healthier living through Operation Smile Program

The IVL Foundation supports Operation Smile, a charitable organization, to provide free surgery for children with cleft lips, cleft palates and other facial deformities. We continue to support their mission by providing financial assistance so that remote hospitals, which lack the necessary funds, can offer full-time surgeries. In addition to corporate contributions, IVL head office staff in Bangkok made cloth bags and pillows containing fibers from our recycled yarns for children who had surgery and joined their mission to help the Operation Smile team screen patients. We expanded the project to Myanmar in 2018 to help more children access free operations, allowing them to live happier and healthier lives. This program brought smile on the faces of 379 children who underwent surgery with Operation Smile in Thailand and Myanmar in 2018.



Our successful CSR activities provided several significant results and outcomes in 2018.



For More Information

Highlighted CSR Activities in 2018

EDUCATION



Canada

Indorama Ventures PTA Montreal offered scholarships to help two student trainees pursue their studies. Both recipients are studying mechanical engineering at École de technologie supérieure (ETS).



United States

Electricians from AlphaPet and Indorama Ventures Xylenes & PTA joined science classes to educate and get students interested about electricity.



Mexico

Indorama Ventures Polymers Mexico welcomed chemical engineering students from Guanajuato University on a site visit.



Poland

Indorama Ventures Poland Sp. z o.o., together with the I Liceum im. Ziemi Kujawskiej secondary school in Wloclawek (LZK), organized a seminar on the subject of “PET as a valuable resource” and held a contest on PET awareness.



Indonesia

PT Indorama Polychem Indonesia provided scholarships for qualified students in Desa Kembangkuning and Desa Cibinong.

HEALTH



United States

StarPet provided disaster relief to victims affected by Hurricane Florence in North Carolina.



United States

AlphaPet contributed to and helped arrange the Lee Lott Power-of-Pink Walk with the Decatur-Morgan Hospital Foundation to raise funds and awareness, and rally support to help find a cure for breast cancer.



Poland

Indorama Ventures Poland organized Breast Health Day providing a lecture on breast cancer and testicular cancer, breast and testicular self-examination training and individual consultations for employees and people in the community.



China

Employees at Performance Fibers Kaiping joined basketball and football games organized by the Cui Shan Lake industrial association and the municipal government.



Thailand

Three subsidiaries in Rayong organized a Mobile Medical clinic. A total of 179 local villagers received free services ranging from cervical cancer testing, dental examinations, massages, and vaccines for pets.

HEALTH



United States

Inorama Ventures Xylenes and PTA's employees volunteered to spend a day collecting household chemicals from city residents to ensure they are disposed of properly.



China

Performance Fibers Kaiping's employees volunteered to clean their community and show their initiative in maintaining an improved environment.

ENVIRONMENT



United States

Inorama Ventures Xylenes and PTA presented Cedar Ridge Middle School with a check for USD 2,000.00 from the Keep America Beautiful initiative. The students collected over 10,000 pounds of recycled materials and reached their goal of 9,000 pounds for the year. This was a combined effort involving CRMS, IVXP and AlphaPet with the support of the Keep America Beautiful Organization and the City of Decatur's recycling program.



Thailand

TPT Petrochemicals offered scholarships to the children of employees at Sea Turtles Conservation Center, Royal Thai Navy, in Sattahip, Thailand. The employees and their families, with members of TPT Cycling Club, also participated in an activity to release sea turtles and snappers in support of marine conservation and biodiversity.



Thailand

Inorama Petrochem PET's CSR team joined with Poo Don communities to build check dams to prevent soil erosion, slow the flow of water downstream and help re-establish vegetation for grazing.



Brazil

Inorama Ventures Polimeros organized the Horta Organica Project which aims to improve the incomes, livelihoods and food quality of families impacted by the project, while promoting stronger ties with the community.



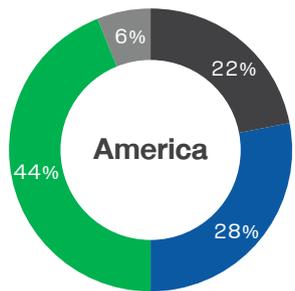
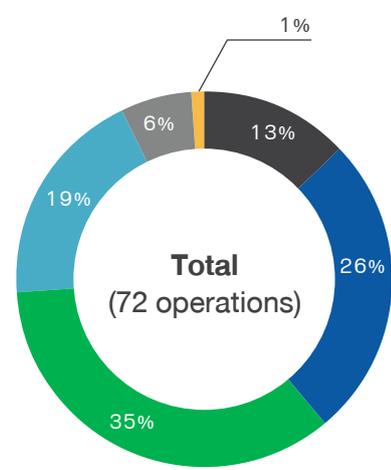
GLOBAL PERFORMANCE

DATA

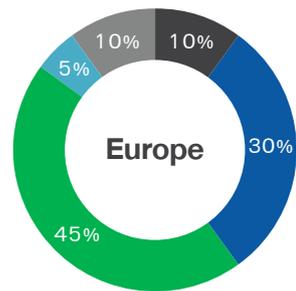
Our 2018 Sustainability Report covers all 72 IVL sites across the globe in all business units including Feedstock (PTA, PIA, EO/EG, PX, NDC), PET, Fibers, Packaging, Recycling and wool as listed below by regions.

Remark:

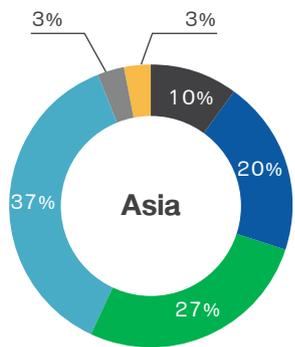
- Feedstock
- PET
- Fibers
- Packaging
- Recycling
- Wool



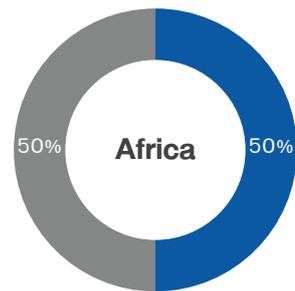
(18 operations)



(20 operations)



(30 operations)



(4 operations)



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

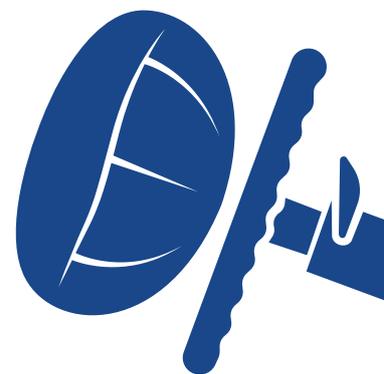
Material Indicators	2015	2016	2017	2018
Total energy consumption	100	100	100	100
Direct GHG Emissions Scope 1	99.6	100	100	100
Indirect GHG Emissions Scope 2	99.7	100	100	100
Total NO _x Emissions	84.1	95.2	100	100
Total SO _x Emissions	77.3	83.9	100	100
Total VOC Emissions	63.6	77.4	100	100
Total waste (excluding reuse and recycle)	99.6	100	100	100
COD in treated wastewater discharged	77.3	93.5	100	100
BOD in treated wastewater discharged	NA	83.9	100	100
Total water withdrawn by sources	100	100	100	100
Wastewater discharge	NA	98.4	100	100
Health & safety	100	100	100	100
Process safety events	10	10	30	50
Spills	65	88	100	100
CSR	60	79	91	94
HR	75.8	100	100	100



Sustainability Performance Data Report 2018



For More
Information



Global Performance Data

Our 2018 Sustainability Report covers all of IVL's sites and business units around the world, including PET, Feedstock (PTA, PIA, EO/EG, PX, NDC), Fibers, Packaging, Recycling and wool as listed below.

Information on Operations Included in the 2018 Sustainability Report

Region	Country	Business
Americas		
AlphaPet, Inc.	USA	●
Auriga Polymers Inc.	USA	● ●
FiberVisions Manufacturing Company	USA	●
FiberVisions Products, Inc.	USA	●
Indorama Ventures (Oxide & Glycols) LLC	USA	●
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 Xylenes and PTA LLC	USA	● ● ● ●
Performance Fibers Operations Mexico, S. de R.L. de C.V.	Mexico	●
PHP Fibers Inc.	USA	●
StarPet Inc.	USA	●
Winnsboro Fibres LLC	USA	●
Europe		
Beverage Plastics Limited	UK	●
FiberVisions A/S	Denmark	●
Glanzstoff Bohemia s.r.o.	Czech Republic	●
Glanzstoff Industries S.R.L.	Italy	●
Glanzstoff Longjumeau 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 Portugal PTA – Unipessoal, LDA.	Portugal	●
Indorama Ventures Quimica S.L.U.	Spain	● ● ● ●
PHP Fibers GmbH	Germany	●
Textilcord Steinfurt S.A.*	Luxembourg	●
Trevira GmbH, Bobingen	Germany	●
Trevira GmbH, Guben	Germany	●
UAB Orion Global Pet	Lithuania	●
Wellman France Recyclage S.A.S	France	●
Wellman International Limited, Ireland	Ireland	●
Wellman International Limited, The Netherlands	The Netherlands	●
Asia		
Asia Pet (Thailand) Limited	Thailand	●
FiberVisions (China) Textiles Products Limited	China	●
Glanzstoff Industries (Qingdao) Co., Ltd.	China	●
Guangdong IVL PET Polymer Company Limited	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	● ●
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	●

Region	Country	Business
Performance Fibers (Kaiping) Company Limited	China	●
Performance Fibers (Kaiping) No.2 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	●

Remarks:

● Feedstock ● PTA ● PET ● Fibers ● Packaging ● Recycling ● Wool

NDC = Naphthalene Dicarboxylate

PIA = Purified Isophthalic Acid

* One of the three Glanzstoff sites, the other two are Glanzstoff Bohemia and Glanzstoff Industries

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

Material Indicators	2015	2016	2017	2018
Total energy consumption	100	100	100	100
Direct GHG Emissions Scope 1	99.6	100	100	100
Indirect GHG Emissions Scope 2	99.7	100	100	100
Total NO _x Emissions	84.1	95.2	100	100
Total SO _x Emissions	77.3	83.9	100	100
Total VOC Emissions	63.6	77.4	100	100
Total waste (excluding reuse and recycle)	99.6	100	100	100
COD in treated wastewater discharged	77.3	93.5	100	100
BOD in treated wastewater discharged	NA	83.9	100	100
Total water withdrawn by sources	100	100	100	100
Wastewater discharge	NA	98.4	100	100
Health & safety	100	100	100	100
Process safety events	10	10	30	50
Spills	65	88	100	100
CSR	60	79	91	94
HR	75.8	100	100	100

Global EHS Data

GRI Standards		Unit	2015	2016	2017	2018
Production						
General	Total production (captive consumption)	Ton of production	7,481,352	9,479,184	10,004,534	11,338,992
	PET	Ton	3,544,468	3,632,085	3,648,922	4,211,040
	PTA	Ton	2,153,836	3,412,773	3,735,362	4,192,671
	Packaging	Ton	82,596	113,202	134,838	155,319
	Fibers	Ton	1,134,341	1,344,039	1,320,941	1,438,564
	Feedstock (e.g. EG/EO)	Ton	361,709	872,173	1,057,123	1,236,703
	Wool	Ton	3,077	2,673	2,188	2,712
	Recycling (flakes)	Ton	108,958	102,239	105,160	101,983
	Others	Ton	92,366	0	0	0
Revenue						
General	Total revenues (including inter-company sales)	USD (million)	7,192	8,655	10,575	12,933
Materials						
301-1	Total material used	Ton	7,881,517	9,846,945	10,656,101	11,418,542
	Raw materials					
	- PTA	Ton	3,482,025	3,802,674	4,061,686	4,281,652
	- MEG	Ton	1,603,761	1,453,127	1,492,315	1,647,427
	- Paraxylene	Ton	-	2,271,643	2,452,829	2,755,828
	- Acetic Acid	Ton	-	124,232	139,606	162,234
	- Purified isophthalic acid	Ton	-	44,479	64,042	70,510
	- PET	Ton	-	302,352	259,809	302,396
	- PP	Ton	-	131,853	123,825	118,622
	- PE	Ton	-	32,504	37,193	67,172
	- HDPE	Ton	-	4,538	5,481	7,134
	- Wool	Ton	-	2,938	2,521	2,600
	- Cardboard packaging	Ton	-	11,096	39,556	3,516
	- Partially oriented yarn (POY) + Textile grade chips	Ton	-	24,506	21,150	0
	Bio-raw materials					
	- Bio-MEG	Ton	15,694	10,718	7,447	15,808
	- Cellulose	Ton	-	-	11,043	11,004
	- PLA	Ton	-	-	2,383	1,088
	Others	Ton	2,780,037	1,490,979	1,791,707	1,830,309
301-2	Recycled materials (bottles to flakes)	Ton	128,890	139,306	143,507	141,242
Energy						
302-1	Total energy consumption	GJ	41,467,851	51,219,219	55,070,650	59,984,717
	• Fuel oil	GJ	219,851	289,919	89,531	109,772
	• Natural Gas	GJ	16,392,113	21,725,557	23,905,980	28,089,267
	• LPG	GJ	58,300	43,109	71,919	60,629
	• Diesel	GJ	23,005	66,716	90,493	150,835
	• Gasoline	GJ	2,802	32,272	31,971	30,422
	• Fuel gas	GJ	-	9,945	31,676	7,709
	• Coal	GJ	12,376,449	14,436,785	13,921,799	14,143,189
	• Other	GJ	24,376	463,662	27,371	101,404
	• Renewable energy consumption	GJ	544,511	885,249	1,348,403	1,324,546
	Biomass	GJ	227,034	373,656	855,872	901,065
	Biogas	GJ	317,477	511,593	492,531	423,481
	• Direct energy sold	GJ	-	(1,276,304)	(1,416,948)	(1,961,330)
	Total indirect energy consumption (electricity, cooling, steam purchased from outside of IVL group)	GJ	9,875,986	14,542,309	16,968,455	17,928,274
		MWh	3,222,334	4,115,769	4,713,460	4,980,076
	- Electricity purchased from conventional Sources (e.g. natural gas, coal, nuclear, heating oil)	GJ	9,408,898	11,486,827	11,934,309	12,684,116
		MWh	2,613,583	3,190,785	3,315,086	3,523,366
	- Purchased steam	GJ	2,151,325	2,238,688	3,763,243	3,723,250
		MWh	597,590	621,858	1,045,345	1,034,236
	- Purchased heating	GJ	-	805,571	414,514	428,143
		MWh	-	223,770	115,143	118,929
	- Purchased cooling	GJ	-	133,308	371,063	300,998
		MWh	-	37,030	103,073	83,611
	- Renewable electricity generated and consumed	GJ	-	6,278	6,237	6,072
		MWh	-	1,744	1,733	1,687
	- Renewable electricity purchased through certificate	GJ	40,180	149,558	1,221,327	1,423,629
		MWh	11,161	41,544	339,257	395,453

GRI Standards		Unit	2015	2016	2017	2018
	Total direct electricity sold	GJ	698,158	86,376	421,526	417,225
		MWh	193,933	23,993	117,091	115,896
	Total steam sold	GJ	1,026,259	188,085	257,933	165,745
		MWh	285,072	52,246	71,648	46,040
	Total indirect electricity sold	GJ	-	3,461	62,778	54,964
		MWh	-	961	17,438	15,268
302-3	Energy intensity	GJ/Ton of production	5.54	5.40	5.50	5.29
302-4	Energy saved due to conservation and efficiency improvements	GJ	413,342	786,520	614,892	416,617
Water Withdrawal and Consumption						
303-1	Total water withdrawn (by sources)	m ³	38,200,946	46,295,100	53,552,616	60,285,763
	- Surface water	m ³	18,472,443	28,612,964	32,036,781	34,920,909
	- Once through cooling water	m ³	2,736,178	1,245,728	2,533,355	1,681,646
	- Municipal water and water utilities	m ³	10,602,732	10,632,287	13,630,142	18,229,684
	- Groundwater	m ³	6,351,455	5,761,373	5,263,939	5,341,836
	- Rainwater	m ³	38,140	42,748	88,398	111,689
	Water intensity	m ³ /Ton of production	5.12	4.88	5.35	5.32
Reused/Recycled Water						
303-3	Total volume of recycled/reused water	m ³	2,780,405	3,053,241	4,699,568	5,292,534
	% of recycled/reused water	%	7.28	6.60	8.78	8.78
Emissions						
305-1	Direct GHG emissions from all sources owned or controlled by the company (Scope 1 emissions)	tCO ₂ e	2,226,176	3,109,687	3,211,409	3,688,970
305-2	Indirect GHG emissions resulting from the generation of electricity, heat, or steam (Scope 2 emissions)	tCO ₂ e	1,842,432	1,979,668	2,316,591	2,224,494
	Total GHG emissions (Scope 1 + Scope 2)	tCO ₂ e	4,068,608	5,089,356	5,528,000	5,913,464
305-4	Scope 1 GHG Intensity	tCO ₂ e/Ton of production	0.298	0.328	0.321	0.325
	Scope 2 GHG Intensity	tCO ₂ e/Ton of production	0.246	0.2088	0.2316	0.1962
	Scope 1 + Scope 2 GHG Intensity	tCO ₂ e/Ton of production	0.544	0.537	0.553	0.522
	GHG Intensity in tons of CO ₂ e per currency total revenue	tCO ₂ e/USD (million)	309.54	588.02	522.74	457.24
	GHG Intensity in tons of CO ₂ e per full time equivalent (FTE) employees	tCO ₂ e/FTE	173.00	352.64	363.80	371.41
305-7	Total NO _x emissions	Ton	2,430	1,642	2,559	2,879
	Total SO _x emissions	Ton	1,075	927	1,518	1,970
	Total VOC emissions	Ton	1,149	2,042	2,078	4,642
Wastewater Discharge						
306-1	Total water discharge volume	m ³	12,940,673	22,131,959	32,222,930	33,659,202
	COD in treated wastewater discharged	Ton	446	1,164	1,542	2,357
	BOD in treated wastewater discharged	Ton	58	112	100	357
	TSS in treated wastewater discharged	Ton	1,577	1,659	295	478
	Oil and grease in treated wastewater discharged	Ton	17		15.6	16.7
	COD in untreated wastewater discharged to a third party	Ton		3,781	4,090	4,374
	BOD in untreated wastewater discharged to a third party	Ton		1,602	888	793
	TSS in untreated wastewater discharged to a third party	Ton		1,034	421	302
	Oil and grease in treated wastewater discharged	Ton		4.04	8.01	5.4
Solid Waste						
306-2	Total hazardous waste	Ton	34,229	47,448	54,001	51,379
	- Reuse	Ton	819	720	30,248	28,959
	- Recycling	Ton	12,545	12,037	4,725	2,960
	- Recovery (including energy recovery)	Ton	782	2,153	1,748	2,188
	- Composting	Ton	13	43	-	-
	- Incineration	Ton	4,151	4,860	11,183	9,616
	- Landfill	Ton	1,684	2,348	5,376	7,349
	- Others	Ton	14,234	25,288	721	306
	Total non-hazardous waste	Ton	83,730	100,300	110,151	119,570
	- Reuse	Ton	1,829	5,864	5,810	7,960
	- Recycling	Ton	39,728	28,221	36,616	43,990
	- Recovery (including energy recovery)	Ton	11,460	5,642	5,919	11,959
	- Composting	Ton	720	6,143	5,911	6,850
	- Incineration	Ton	819	779	1,367	1,080
	- Landfill (General waste)	Ton	16,681	27,831	35,746	38,609
	- Others	Ton	12,494	25,820	18,781	9,122
	Total Reused, Recycled and Recovered Waste	Ton	67,162	54,637	85,066	98,017
Total waste disposed (not Reused, Recycled or Recovered)	Ton	50,797	93,112	79,086	72,932	
306-4	Total weight of hazardous waste transported	Ton	32,873	43,869	57,724	48,388
	Total weight of hazardous waste treated	Ton	6,594	6,724	5,530	5,985
	The total weight of hazardous waste shipped internationally	Ton	8	25	183	362

GRI Standards		Unit	2015	2016	2017	2018
Spills						
306-3	Total significant spills	Case	41	38	42	18
		Ton	94	90	513	28
	- Hydrocarbon spills	Case	0	2	4	5
		Ton	0	0	7	12.9
	- Chemical spills	Case	30	31	26	13
		Ton	89	50	30	15.2
	- Other spills	Case	11	5	12	0
	Ton	4	39	476	0	
Process Safety						
	Tier 1					
	- No. of events	Case	0	0	5	8
	- Rate	Case/Million man-hours	0	0	0.48	0.43
	Tier 2					
	- No. of events	Cases	0	1	3	4
	- Rate	Case/Million man-hours	0	0.31	0.29	0.215
Environmental Compliance						
307-1	ALL FINES: Monetary value of ALL fines for non-compliance with environmental laws and regulations	USD	205	260	54,618	36,607
	FINES OVER USD 10,000: Monetary value of significant fines over USD 10,000 for non-compliance with environmental laws and regulations	USD	0	0	42,866	36,607
	Total number of non-monetary sanctions for non-compliance with environmental laws and regulations	Case	4	2	0	0
	Total number of non-monetary sanctions for non-compliance with environmental laws and regulations that were incurred	Case	4	2	0	0
Employees						
102-8	Total Employees	Person	12,868	14,432	15,195	15,922
	- Male	Person	10,080	11,257	11,844	12,524
	- Female	Person	2,788	3,175	3,351	3,398
	Total Contractors	Person	1,837	2,811	2,115	3,234
	- Male	Person	1,437	2,277	1,704	2,730
	- Female	Person	400	534	411	504
Occupational Health and Safety						
403-1	Total workforce represented in formal joint management-worker health and safety committees	Person	2,772	3,650	12,461	13,118
	Percentage of workforce represented in formal joint management-worker health and safety committees	%	22	25	82	82
403-2	Total Recordable Injury rate (TRIR) (per 200,000 man-hours)	No/200,000 man-hours	1.57	1.00	1.19	1.29
	Employees	No/200,000 man-hours	1.57	1.05	1.21	1.41
	- Male	No/200,000 man-hours	1.65	1.12	1.41	1.52
	- Female	No/200,000 man-hours	1.21	0.77	0.50	0.98
	Contractors	No/200,000 man-hours	1.55	0.80	1.10	0.78
	- Male	No/200,000 man-hours	1.79	0.94	1.35	0.87
	- Female	No/200,000 man-hours	0.34	0.00	0.00	0.33
	Total Recordable Injury (not including first aid incidents)	Case	214	151	206	241
	Employees	Case	186	126	176	214
	- Male	Case	161	109	160	184
	- Female	Case	25	17	16	30
	Contractors	Case	28	25	30	27
	- Male	Case	27	25	30	25
	- Female	Case	1	0	0	2
	Lost Time Injury Frequency Rate (LTIFR) (per million man-hours)	No/Million man-hours	3.67	2.95	3.61	3.71
	Employees	No/Million man-hours	3.60	3.18	3.98	4.16
	- Male	No/Million man-hours	3.49	3.13	4.40	4.47
	- Female	No/Million man-hours	3.80	3.40	2.49	2.93
	Contractors	No/Million man-hours	4.15	2.08	1.65	1.73
	- Male	No/Million man-hours	4.97	2.44	2.03	1.92
	- Female	No/Million man-hours	0.0	0.0	0.0	0.82
Total Lost-Time Injuries	Case	100	89	125	138	
Employees	Case	85	76	116	126	
- Male	Case	68	61	100	108	
- Female	Case	17	15	16	18	
Contractors	Case	15	13	9	12	
- Male	Case	15	13	9	11	
- Female	Case	0	0	0	1	

GRI Standards		Unit	2015	2016	2017	2018
403-3	Occupational Illness Frequency Rate (OIFR)	No/Million man-hours	0.04	0.066	0.145	0
	Employees	No/Million man-hours	0	0.0837	0.0343	0
	- Male	No/Million man-hours	0	0.1026	0.0440	0
	- Female	No/Million man-hours	0	0	0	0
	Contractors	No/Million man-hours	0	0	0.734	0
	- Male	No/Million man-hours	0	0	0.9023	0
	- Female	No/Million man-hours	0	0	0	0
	Total number of occupational disease cases	Case	1	2	5	0
	Employees	Case	1	2	1	0
	- Male	Case	1	2	1	0
	- Female	Case	0	0	0	0
	Contractors	Case	0	0	4	0
	- Male	Person	0	0	4	0
	- Female	Person	0	0	0	0
	Fatalities (all employees and contractors)	Person	0	0	0	0
	Employees	Person	0	0	0	0
	- Male	Person	0	0	0	0
	- Female	Person	0	0	0	0
	Contractors	Person	0	0	0	0
	- Male	Person	0	0	0	0
	- Female	Person	0	0	0	0
	Lost day rate (LDR)	Days/Million man-hours	83	42	51	66
	Employees	Days/Million man-hours	87	47	51	77
	- Male	Days/Million man-hours	99	43	58	87
	- Female	Days/Million man-hours	27	62	28	37
	Contractors	Days/Million man-hours	56	26	47	17
	- Male	Days/Million man-hours	37	30	57	17
	- Female	Days/Million man-hours	151	0	0	17
	Total number of lost days (only including lost scheduled work days)	Man Days	2,252	1,275	1,754	2,452
	Employees	Man Days	2,049	1,116	1,499	2,336
	- Male	Man Days	1,939	842	1,322	2,106
	- Female	Man Days	110	273	177	230
	Contractors	Man Days	203	160	255	116
	- Male	Man Days	113.0	160	255	95
	- Female	Man Days	90.0	-	-	21
	Absentee rate (AR)	%	1.8	2.2	2.1	2.0
	Employees	%	2.0	2.6	2.4	2.4
	- Male	%	1.9	2.39	2.37	2.34
	- Female	%	2.6	3.55	2.38	2.65
	Contractors	%	0.2	0.7	0.4	0.3
- Male	%	0.2	0.54	0.29	0.29	
- Female	%	0.2	1.61	0.71	0.46	
Absentee days	Days	62,870	83,206	88,825	93,668	
Employees	Days	61,870	77,779	86,318	90,871	
- Male	Days	46,916	58,178	67,179	70,527	
- Female	Days	14,954	19,601	19,139	20,344	
Contractors	Days	1,000	5,427	2,507	2,797	
- Male	Days	860	3,577	1,609	2,098	
- Female	Days	140	1,850	898	699	
Near Miss	Case		720	959	1,870	
Employees	Case		643	861	1,750	
- Male	Case		575	726	1,611	
- Female	Case		68	135	139	
Contractors	Case		77	98	120	
- Male	Case		68	90	118	
- Female	Case		9	8	2	
Workers with high incidence or high risk of diseases related to their occupation	Person	114	882	402	744	
Employees	Person	81	825	307	703	
- Male	Person	81	789	307	587	
- Female	Person	0	36	0	116	
Contractors	Person	33	57	95	41	
- Male	Person	33	54	91	37	
- Female	Person	0	3	4	4	

Global Human Resources Data

GRI Standards		Unit	2015	2016	2017	2018
Employees						
102-8	Total employees by gender	Person	12,868	14,432	15,195	15,922
	- Male	Person	10,080	11,257	11,844	12,524
	- Female	Person	2,788	3,175	3,351	3,398
	Total permanent employees	Person	12,273	13,769	14,525	15,221
	- Male	Person	9,583	10,718	11,299	11,944
	- Female	Person	2,690	3,051	3,226	3,277
	Total temporary employees	Person	595	663	670	701
	- Male	Person	497	539	545	580
	- Female	Person	98	124	125	121
102-8	Total employees by level*	Person	12,273	13,769	14,525	15,221
405-1	• Executive Management	Person	79	88	94	101
	- Male	Person	71	79	83	88
	- Female	Person	8	9	11	13
	• Senior Management	Person	330	369	388	414
	- Male	Person	256	286	301	320
	- Female	Person	74	83	87	94
	• Middle Management	Person	1,257	1,409	1,485	1,619
	- Male	Person	1,006	1,125	1,185	1,281
	- Female	Person	251	284	300	338
	• Junior Management	Person	5,156	5,778	6,106	5,831
	- Male	Person	3,602	4,028	4,246	3,521
	- Female	Person	1,554	1,750	1,860	2,310
	• Non - Management*	Person	5,451	6,125	6,452	7,256
	- Male	Person	4,648	5,200	5,484	6,734
	- Female	Person	803	925	968	522
	Total employees by age*	Person	12,273	13,769	14,525	15,221
	• Over 50 years old	Person	1,709	2,153	2,488	3,328
	- Male	Person	1,399	1,810	2,118	2,742
	- Female	Person	310	343	370	586
	• 30-50 years old	Person	7,480	8,222	8,542	9,024
	- Male	Person	5,784	6,210	6,412	6,896
	- Female	Person	1,696	2,012	2,130	2,128
	• Below 30 years old	Person	3,084	3,394	3,495	2,869
	- Male	Person	2,400	2,698	2,769	2,306
	- Female	Person	684	696	726	563
New employee hires*						
401-1	Total new employees	Person	1,645	1,484	1,732	1,758
	- Male	Person	1,292	1,054	1,274	1,216
	- Female	Person	353	430	458	542
	Total new employee hire rate	New hire rate (%)	13.40	10.78	11.92	11.55
	- Male	New hire rate (%)	13.48	9.83	11.28	10.18
	- Female	New hire rate (%)	13.12	14.09	14.20	16.54
	Total new employees by age	Person	1,645	1,484	1,732	1,758
	• Over 50 years old	Person	96	102	99	93
	- Male	Person	90	93	80	74
	- Female	Person	6	9	19	19
	• 30-50 years old	Person	626	691	698	754
	- Male	Person	501	500	485	497
	- Female	Person	125	191	213	257
	• Below 30 years old	Person	923	691	935	911
	- Male	Person	701	461	709	645
	- Female	Person	222	230	226	266
	Total new employee hire rate by age	New hire rate (%)	13.40	10.78	11.92	11.55
	• Over 50 years old	New hire rate (%)	5.62	4.74	3.98	2.79
	- Male	New hire rate (%)	6.43	5.14	3.78	2.70
	- Female	New hire rate (%)	1.94	2.62	5.14	3.24
	• 30-50 years old	New hire rate (%)	8.37	8.40	8.17	8.36
	- Male	New hire rate (%)	8.66	8.05	7.56	7.21
	- Female	New hire rate (%)	7.37	9.49	10.00	12.08

GRI Standards		Unit	2015	2016	2017	2018	
401-1	• Below 30 years old	New hire rate (%)	29.93	20.36	26.75	31.75	
	- Male	New hire rate (%)	29.21	17.09	25.60	27.97	
	- Female	New hire rate (%)	32.46	33.05	31.13	47.25	
Employee Turnover*		Full time employees					
401-1	Total employee turnover	Person	1,094	909	861	896	
	- Male	Person	884	676	665	671	
	- Female	Person	210	233	196	225	
	Total employee turnover rate	Turnover rate (%)	8.91	6.60	5.93	5.89	
	- Male	Turnover rate (%)	9.22	6.31	5.89	5.62	
	- Female	Turnover rate (%)	7.81	7.64	6.08	6.87	
	Total employee turnover by age	Person	1,094	909	861	896	
	• Over 50 years old	Person	160	172	195	255	
	- Male	Person	128	132	157	203	
	- Female	Person	32	40	38	52	
	• 30-50 years old	Person	511	438	414	364	
	- Male	Person	401	314	319	252	
	- Female	Person	110	124	95	112	
	• Below 30 years old	Person	423	299	252	277	
	- Male	Person	355	230	189	216	
	- Female	Person	68	69	63	61	
	Employee turnover rate by age	Turnover rate (%)					
	Total employee turnover rate by age	Turnover rate (%)	8.91	6.60	5.93	5.89	
	• Over 50 years old	Turnover rate (%)	9.36	7.99	7.84	7.66	
	- Male	Turnover rate (%)	9.15	7.29	7.41	7.40	
	- Female	Turnover rate (%)	10.32	11.66	10.27	8.87	
	• 30-50 years old	Turnover rate (%)	6.83	5.33	4.85	4.03	
	- Male	Turnover rate (%)	6.93	5.06	4.98	3.65	
	- Female	Turnover rate (%)	6.49	6.16	4.46	5.26	
	• Below 30 years old	Turnover rate (%)	13.72	8.81	7.21	9.65	
	- Male	Turnover rate (%)	14.79	8.52	6.83	9.37	
	- Female	Turnover rate (%)	9.94	9.91	8.68	10.83	
	Voluntary employee turnover	Person	888	807	680	815	
	Voluntary employee turnover rate	Turnover rate (%)	7.24	5.86	4.68	5.35	
	Number of employee laid off	Person	0	89	113	81	
	- Male	Person	0	89	107	69	
	- Female	Person	0	0	6	12	
	Number of negotiations	Person	61	28	35	36	
Parental Leave*							
401-3	Number of employees entitled for parental leave	Person	4,334	5,448	8,382	9,750	
	- Male	Person	3,402	4,299	6,114	7,429	
	- Female	Person	932	1,149	2,268	2,321	
	Number of employees who took parental leave	Person	188	224	368	768	
	- Male	Person	116	149	264	543	
	- Female	Person	72	75	104	225	
	Number of employees who returned to work after taking parental leave	Person	172	194	345	639	
	- Male	Person	107	143	257	494	
	- Female	Person	65	51	88	145	
	Return to work rate (after parental leave)	%	91	86.61	93.75	83.20	
	- Male	%	92	95.97	97.35	91	
	- Female	%	90	68	84.62	64	
	Retention to work (after parental leave and still employed for the next 12 months)	Person	167	171	325	603	
	- Male	Person	105	131	239	465	
	- Female	Person	62	40	86	138	
	Retention Rate (after parental leave and still employed for the next 12 months)	%	97.09	88.14	94	100	
	- Male	%	98.13	91.61	93	94.13	
	- Female	%	95.38	78.43	98	95.17	
	Employees training*						
	404-1	Total training hours provided to employees	Hour	186,914	284,356	329,779	463,175
		- Male	Hour	141,557	211,450	247,584	352,338
- Female		Hour	45,357	72,906	82,195	110,837	
Total average training hours		Hour/Employee	15.2	20.7	22.7	30.43	
- Male		Hour/Employee	14.8	19.7	21.9	29.5	
- Female		Hour/Employee	16.9	23.9	25.5	33.8	

GRI Standards		Unit	2015	2016	2017	2018
404-1	Total training hours by management category	Hour	186,914	284,356	329,779	463,175
	• Executive Management	Hour	2,060	2,349	2,676	3,077
	- Male	Hour	1,835	2,077	2,324	2,675
	- Female	Hour	225	272	352	402
	• Senior Management	Hour	7,381	8,537	9,489	10,687
	- Male	Hour	5,825	6,717	7,228	7,987
	- Female	Hour	1,556	1,820	2,261	2,700
	• Middle Management	Hour	19,493	23,726	32,629	38,734
	- Male	Hour	14,775	17,979	26,023	29,034
	- Female	Hour	4,718	5,747	6,606	9,700
	• Non - management	Hour	86,993	115,958	144,175	200,014
	- Male	Hour	65,901	88,521	111,341	145,014
	- Female	Hour	21,092	27,437	32,834	55,000
	- Male	Hour	70,987	133,786	140,810	210,663
- Female	Hour	53,221	96,156	100,668	167,628	
- Female	Hour	17,766	37,630	40,142	43,035	
Performance Review*						
404-3	Total employees receiving regular performance reviews	Person	8,123	13,769	14,525	15,221
	• Executive Management	Person	79	88	94	101
	• Senior Management	Person	330	369	388	414
	• Middle Management	Person	1,257	1,409	1,485	1,619
	• Junior Management	Person	4,300	5,778	6,106	5,831
	• Non - Management	Person	2,157	6,125	6,452	7,256
	Percentage of employees receiving regular performance reviews	%	66.19	100	100	100
	• Executive Management	%	100	100	100	100
	• Senior Management	%	100	100	100	100
	• Middle Management	%	100	100	100	100
	• Junior Management	%	83	100	100	100
	• Non - Management	%	40	100	100	100
	Total employees receiving career development reviews	Person	7,806	12,514	14,242	14,237
	• Executive Management	Person	79	88	94	101
	• Senior Management	Person	330	369	388	414
	• Middle Management	Person	1,257	1,409	1,485	1,619
	• Junior Management	Person	4,300	5,778	6,106	5,831
	• Non - Management	Person	1,840	4,870	6,169	6,272
	Percentage of employees receiving career development reviews	%	63.60	90.89	98.05	93.54
	• Executive Management	%	100	100	100	100
	• Senior Management	%	100	100	100	100
	• Middle Management	%	100	100	100	100
• Junior Management	%	83.4	100	100	100	
• Non - Management	%	33.8	79.5	95.6	86.4	
Remuneration ratio of women to men						
405-2	Strategic	Ratio	0.860	0.950	0.960	0.960
	Managerial	Ratio	0.910	0.931	0.944	0.945
	Supervisory and Operational	Ratio	0.890	0.912	0.929	0.930
Employee Engagement Score*						
	Employee engagement score	%	85.92	86.02	90.68	90.97
	- Male	%	82.98	82.62	93.20	93.28
	- Female	%	88.91	89.39	89.90	90.01
	Data coverage of employee engagement survey		90.42	93.50	93.75	93.43
	- Male	% of male employees	89.80	93.40	93.60	93.1
	- Female	% of female employees	91.10	93.31	93.98	93.8
Collective Bargaining						
102-41	Total employees covered by collective bargaining agreements	Person	4,391	6,948	7,748	7,810
	Percentage of total employees covered by collective bargaining agreements	%	34.12	48.14	50.99	51.31
	Number of consultations/negotiations with trade unions over organizational changes [unit]	Number	56	65	94	334
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	3,251	9,269	14,256	17,210
	Total number of employees trained in human rights policies or procedures concerning aspects of human rights that are relevant to operations	Person	3,832	7,997	11,403	12,819

GRI Standards		Unit	2015	2016	2017	2018
412-2	Percentage of employees trained in human rights policies or procedures concerning aspects of human rights that are relevant to operations	% of total employees	29.8	55.4	75.0	80.5
Non-discrimination						
406-1	Total number of incidents of discrimination and corrective actions taken	Case	1	2	4	0
	Number of incidents of discrimination and corrective actions taken regarding employees	Case	1	1	3	0
	Number of incidents of discrimination and corrective actions taken to all excluding employees	Case	0	1	1	0
Security Practices						
410-1	Total number of security personnel trained in the organization's human rights policies or procedures that are relevant to operations [unit]	Person	89	405	332	305
	Percentage of security personnel trained in the organization's human rights policies or procedures that are relevant to operations [%]	%	41.98	87.85	88.30	86.65
	Total number of security personnel	Person	212	461	376	352
Rights of Indigenous Peoples						
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	59	69	83	91
	Total number of operations that have been subject to human rights reviews or impact assessments	Number	59	69	83	91
	Percentage of operations that have been subject to human rights reviews or impact assessments [unit]	%	99.00	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	45	41	26	27
	Total number of grievances about labor practices addressed during the reporting period	Case	48	44	16	25
	Total number of grievances about labor practices resolved during the reporting period	Case	36	32	12	18
	Total number of grievances about labor practices filed prior to the reporting period that were resolved during the reporting period	Case	27	24	15	21

* 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	2015	2016	2017	2018
Local Community Engagement						
413-1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	%	50	73.1	89.6	67
	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	15	18	15	29
	Number of operation with implemented social impact assessment including gender assessment	Number	4	4	11	10
	Number of operation with implemented environmental impact assessment	Number	12	14	20	21
	Number of operation with implemented public disclosure of results of environmental and social impact assessment	Number	8	9	13	12
	Number of operation with implemented local community development programs	Number	6	10	17	18
	Number of operation with implemented stakeholder engagement plans	Number	4	9	14	13
	Number of operation with implemented broad base local community consultation committees and processes	Number	4	4	9	10
	Number of operation with implemented works councils, occupational health and safety committees and other employee representation bodies to deal with impacts	Number	14	12	20	21
	Number of operation with implemented formal local community grievance process	Number	8	6	12	3
Social Grievances						
	Number of grievances regarding society received through the formal grievance process	Number	7	4	1	1
	Total number of societal grievances addressed during this reporting period	Number	7	4	0	0
	Total number of societal grievances resolved during this reporting period	Number	7	4	0	0
	Total number of societal grievances resolved in the previous reporting period	Number	6	1	4	1
Total philanthropic activities						
	Total philanthropic activities	%	100	100	100	100
	Charitable donations	USD	221,921	131,135	888,367	970,856
	Community investments	USD	89,863	445,808	645,634	971,420
	Commercial Initiatives in the community	USD	203,214	77,239	325,003	406,629
Philanthropic contributions						
	Total cash contributions	USD	486,298	546,010	1,749,830	1,771,435
	Time: Estimated employee costs	USD	38,961	866,390	1,918,393	1,007,502
	Time: Employee volunteering during paid working hours	Hour	2,516	53,102	103,681	58,640
	Total in-kind giving	USD	15,937.20	79,923.86	93,160.48	122,914.06
	Total management overheads	USD	12,587.54	32,687.70	16,012.59	454,556.05

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 the carbon footprint of Indorama Ventures Public Company Limited for the reporting period 01/01/2018 - 31/12/2018 (inclusive) to be

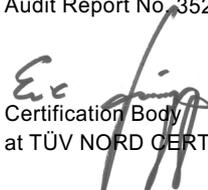
Emissions Source	Amount (tCO ₂ eq)
Scope 1	3,688,970
Scope 2 (Location Based)	2,224,494
Overall	5,913,464
Scope 2 (Market Based)	2,181,107

The company boundary encompasses all 72 operating sites globally including the wholly owned operations, subsidiaries and joint ventures with operational control. 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), biogas, refrigerant, fire suppression equipment electrical equipment SF6, grid electricity, third party electricity, third party heat, steam, compressed air, chilled water, cooling water and biomass combustion. The calculations have been carried out according to ISO 14061-3.

3,688,970 tCO₂eq Scope 1 as well as 2,224,494 tCO₂eq Scope 2 (Locations Based).

Certificate Registration No. 44 776 180191
 Audit Report No. 3523 9757

Valid for the year: 2018


 Certification Body
 at TÜV NORD CERT GmbH

Essen, 2019-05-06

TÜV NORD CERT GmbH

Langemarckstraße 20

45141 Essen

www.tuev-nord-cert.com



ABOUT THIS REPORT



Providing a better
understanding of
our sustainable
development efforts

Our Approach

IVL publishes a sustainability report annually as part of our commitment to communicating effectively and transparently, and providing a better understanding of our sustainable development efforts. This includes our economic, environmental and social initiatives, which allows us to strengthen our engagement with stakeholders regarding how we are integrating sustainability into our operations. This report provides insights into our approach to sustainability, along with our objectives, strategy and performance.

Scope of the Report

Our 2018 Sustainability Report covers our operations across five continents in 26 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 period from January 1 to December 31, 2018,

unless otherwise stated. We also provide some information about decisions and events that took place in early 2019 so that readers have more up-to-date information. As IVL is undergoing significant growth, we recognize the importance of ensuring progress on sustainability. This report is based on the Global Reporting Initiative (GRI) standards. 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.

Our previous [Sustainability Reports](#) from 2010–2017 are available on our website.

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 of 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 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:

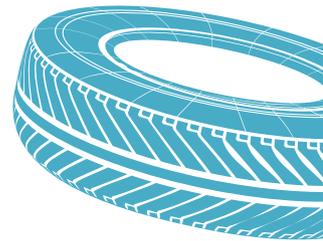
- Prioritizing our resources for the sustainability issues that matter most to our business and stakeholders.

- 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 opinion of our internal and external stakeholders, and incorporated the feedback received 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 providing accurate information and metrics for our stakeholders and the public.

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 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 72 operating sites excluding the entities mentioned in the exceptions below, compared to 69 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.

Changes in size, structure, ownership and developments

The list of entities acquired, incorporated and other developments is available in the 2018 Annual Report on pages 78–79 and on [our website](#) under News & Events.

Exceptions

The 2018 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, 2018^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, employee engagement excludes the following:

- The information of the entities acquired or operations commenced on or after 1 July, 2018^A
- Joint ventures with a 50% or less shareholding and no management control^B



Restatements

Where available, we include comparative historical data to demonstrate trends. The scope of the report can change year to year, depending on acquisitions or new incorporations. From this year onwards, the scope of data is reported based on equity-based accounting in line with financial reporting. This resulted in changes of historical data reported for prior years and could affect the data reported in the future. In our efforts to continually improve and standardize our annual reporting process, the interpretation of some of the data has changed and certain comparative amounts for prior years have been restated to conform to the presentation adopted for this reporting period.

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.

Remark

A: Entities acquired or operations commenced on or after 1 July, 2018:

- Avgol America Inc., the United States
- Avgol India Private Limited, India
- Avgol Industries 1953 Ltd., Israel
- Avgol Ltd., Israel
- Avgol Limited Liability Company, Russia
- Hubei Gold Dragon Nonwoven Fabrics, Co, Ltd., China
- Indorama Ventures Olefins LLC, the United States
- Kordárna Plus a.s., the Czech Republic
- Kordárna Plus a.s., Slovakia
- Medco Plast for Packing and Packaging Systems S.A.E., Egypt
- Sorepla Technologie S.A., France
- Performance Fibers Kaiping (No.3) Company Limited
- Schoeller Kresice s.r.o., Czech Republic
- Schoeller GmbH & CoKG, Austria
- M&G Fibras Brasil S.A., Brazil
- UTT Beteiligungsgesellschaft mbH, Germany and Mexico
- INVISTA Resins & Fibers GmbH, Germany

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

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

Independent Assurance Statement

Introduction and Engagement

Indorama Ventures Public Company Limited (hereafter “IVL” or “the Company”) commissioned TUV India Private Limited (TUVI) to conduct the independent external assurance of IVL’s sustainability report (hereinafter “the Report”), which includes 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 concerning the sustainability information 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. The onsite verification was conducted in March 2019 for plants in China namely, Guangdong IVL PET Polymer Co. Ltd. (Kaiping, Guangdong Province, PRC), Performance Fibers 1 and 2 (Kaiping, Guangdong Province, PRC), FiberVisions (Suzhou), together with a desk review carried out for all other IVL sites within the reporting boundary.

The Report covers IVL’s sustainability information for the January 1, 2018 to December 31, 2018 period.

Scope, Boundary and Limitations of Assurance

The scope of the assurance includes the Environmental and Social disclosures in the Report as per the “Core” option required in the GRI Standards. Engagement includes the following with respect to assurance:

- Verification of the application of the Report content, principles as mentioned in the GRI Standards, and the quality of 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 a Type 1, moderate level of assurance;
- Verification of the reliability of the GRI Standards Disclosure 302-1, 302-3, 303-1, 303-3, 305-1, 305-2, 305-7, 306-1, 306-2, 306-3, 403-2, 404-1;
- Specified information was selected based on the materiality determination and needs 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 from January 1, 2018 to December 31, 2018.

Verification Methodology

This assurance engagement was planned and carried out in accordance with the GRI Standards and AA1000AS (2008). 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 for it's in accordance 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 determination 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 site visit;
- 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 were considered in drawing our conclusions on the Report. They are generally consistent with the management's objectives.

The opportunities are as follows:

- Acceleration of renewable energy consumption at possible operational sites;
- Establishing Science-Based Targets on carbon emissions at the group level;
- Prioritization of water recycling, reuse, reduction and rainwater harvesting at possible sites;
- Water metering at all sites so that wastewater discharge data is based on measured values rather than estimation;
- Process Safety (API RP 754) is recommended;
- Evaluating the possibility of zero hazardous waste to landfill;
- Additional training on "Data Management through the Sustainability Platform, Process Safety (API RP 754)."

Conclusions

The Report has been prepared based on GRI Reporting Principles and Standard Disclosures for the "in accordance" Core option. In our opinion, based on the scope of this assurance engagement, the disclosures on sustainability performance reported in the Report along with 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 for defining report 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 for "in accordance" Core reporting.

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 uses 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 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 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. 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.

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.

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 performances 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



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

Date: 30/04/2019
Place: Mumbai, India
Project Reference No: 8115385158

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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. 90	-
102-2	Activities, brands, products, and services	AR p. 40-56 / SR p. 10-11 / IVL website	-
102-3	Location of headquarters	AR p. 38 / SR p. 90 / IVL website	-
102-4	Locations of operations	AR p. 39 / SR p. 10-11 / IVL website	-
102-5	Ownership and legal form	AR p. 38 / SR p. 80-83	-
102-6	Market served	AR p. 39 / SR p. 10-11	-
102-7	Scale of the organization	SR p. 13, 61-62	-
102-8	Information on employees and other workers	SR p. 13, 61-62	-
102-9	Supply chain	SR p. 10-11 / IVL website	-
102-10	Significant changes to the organization and its supply chain	SR p. 83	-
102-11	Precautionary principle or approach	SR p. 80-83	-
102-12	External initiatives	AR p. 173-174 / SR p. 15-16, 33, 41, 73-77	-
102-13	Membership of associations	SR p. 15 / IVL website	-
Strategy			
102-14	Statement from senior decision-maker	SR p. 7-10	-
102-15	Key impacts, risks and opportunities	SR p. 29-30	-
Ethics and Integrity			
102-16	Values, principles, standards, and norms of behavior	SR p. 16-17, 27-28	-
102-17	Mechanisms for advice and concerns about ethics	AR p. 181-182 / SR p. 27-28 / IVL website	-
Governance			
102-18	Governance structure	SR p. 16-17, 25 / IVL website	-
102-19	Delegating authority	SR p. 29-30	-
102-20	Executive-level responsibility for economic, environmental, and social topics	SR p. 16-17, 25 / IVL website	-
102-21	Consulting stakeholders on economic, environmental, and social topics	SR p. 19 / IVL website	-
102-22	Composition of the highest governance body and its committees	SR p. 25 / IVL website	-
102-23	Chair of the highest governance body	SR p. 25 / IVL website	-
102-24	Nominating and selecting the highest governance body	SR p. 25	-
102-26	Role of highest governance body in setting purpose, values, and strategy	AR: 143-165 / SR p. 16-17, 25 / IVL website	-
102-27	Collective knowledge of highest governance body	SR p. 25	-
102-28	Evaluating the highest governance body's performance	SR p. 25-26	-
102-29	Identifying and managing economic, environmental, and social impacts	SR p. 19-23	-
102-30	Effectiveness of risk management processes	AR p. 125-135, 136-138 / SR p. 29-30	-
102-31	Review of economic, environmental, and social topics	SR p. 25-77	-
102-32	Highest Governance body's role in sustainability reporting	SR p. 16-17 / IVL website	-
Stakeholder Engagement			
102-40	List of stakeholder groups	SR p. 21-23 / IVL website	-
102-41	Collective Bargain	SR p. 58 / IVL website	-
102-42	Identifying and selecting stakeholders	SR p. 21-23 / IVL website	-
102-43	Approach to stakeholder engagement	SR p. 21-23, 28 / IVL website	-
102-44	Key topics and concerns raised	SR p. 21-23	-
Reporting Practices			
102-45	Entities included in the consolidated financial statements	AR p. 40-56 / SR p. 78, 83	-
102-46	Defining report content and topic boundaries	SR p. 80-83	-
102-47	List of material topics	AR p. 172 / SR p. 20-23	-
102-48	Restatements of information	SR p. 83	-
102-49	Changes on reporting	SR p. 83	-
102-50	Reporting period	SR p. 80-83	-
102-51	Date of most recent report	SR p. 80-83	-
102-52	Reporting cycle	SR p. 80-83	-
102-53	Contact point for questions regarding the report	SR p. 90	-
102-54	Claims of reporting in accordance with the GRI Standards	SR p. 18, 80, 88-89	-
102-55	GRI content index	SR p. 88-89	-
102-56	External assurance	SR p. 84-87	-
Management Approach			
103-1	Explanation of the material topic and its boundary	SR p. 21-23, 24-77	-
103-2	The management approach and its components	SR p. 24-77	-
103-3	Evaluation of the management approach	SR p. 24-77	-

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. 93-94, 192 / SR p. 12 / IVL website	-
201-2	Financial Implications and other risks and opportunities due to climate change	SR p. 29, 40-41 / IVL website	-
Market Presence			
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	SR p. 63	-
Anti-Corruption			
205-1	Operations assessed for risks related to corruption	AR p. 154 / SR p. 26 / IVL website	-
205-2	Communication and training about anti-corruption policies and procedures	AR p. 154 / SR p. 26 / IVL website	-
205-3	Confirmed incidents of corruption and actions taken	AR p. 154 / SR p. 26 / IVL website	-
Anti-Competitive Behavior			
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	AR p. 154 / SR p. 26 / IVL website	-
Materials			
301-1	Materials used by weight or volume	SR p. 12 / IVL website	-
301-2	Recycled input materials used	SR p. 12, 52-53 / IVL website	-
Energy			
302-1	Energy consumption within the organization	SR p. 12, 38-39 / IVL website	SR p. 84-87
302-3	Energy Intensity	SR p. 12, 38-39 / IVL website	SR p. 84-87
302-4	Reduction of energy consumption	SR p. 12, 38-39 / IVL website	-
Water			
303-1	Water withdrawal by source	SR p. 12, 42-43 / IVL website	SR p. 84-87
303-3	Water recycled and reused	SR p. 12, 42-43	SR p. 84-87
Emissions			
305-1	Direct (Scope 1) GHG emissions	SR p. 12, 40	SR p. 84-87
305-2	Energy indirect (Scope 2) emissions	SR p. 12, 40	SR p. 84-87
305-4	GHG emissions intensity	SR p. 12, 40	-
305-7	Nitrogen oxides (NO _x), sulfur oxides (SO _x), and other significant air emissions	SR p. 45	SR p. 84-87
Effluents and Waste			
306-1	Water discharge by quality and destination	IVL website	SR p. 84-87
306-2	Waste by type and disposal method	SR p. 44 / IVL website	SR p. 84-87
306-3	Significant spills	IVL website	SR p. 84-87
306-4	Transport of hazardous waste	IVL website	-
Environmental Compliance			
307-1	Non-compliance with environmental laws and regulations	SR p. 35 / IVL website	-
Supplier Environmental Assessment			
308-1	New suppliers that are screened using environmental criteria	IVL website	-
Employment			
401-1	New employee hires and employee turnover	AR p. SR p. 63 / IVL website	-
401-3	Parental Leave	IVL website	-
Occupational Health and Safety			
403-1	Workers representation in formal joint management-worker health and safety committees	SR p. 58 / IVL website	-
403-2	Types of injury and rated of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	SR p. 12, 56-57 / IVL website	SR p. 84-87
403-3	Workers with high incidence or high risk of diseases related to their occupation	SR p. 78 / IVL website	-
Training and Education			
404-1	Average hours of training per year per employee	SR p. 12, 67 / IVL website	SR p. 84-87
404-2	Programs for upgrading employees skills and Transition assistance programs	SR p. 65-68	-
404-3	Percentage of employees receiving regular performance and career development reviews	IVL website	-
Diversity and Equal Opportunity			
405-1	Diversity of governance bodies and employees	SR p. 25, 63 / IVL website	-
405-2	Ratio of basic salary and remuneration of woman to man	SR p. 63	-
Non-Discrimination			
406-1	Incidents of discrimination and corrective actions taken	SR p. 60-61 / IVL website	-
Freedom of Association and Collective Bargaining			
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	SR p. 60-61 / IVL website	-
Child Labor			
408-1	Operations and suppliers at significant risk for incidents of child labor	SR p. 61 / IVL website	-
Force or Compulsory Labor			
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	SR p. 61	-
Security Practices			
410-1	Security personnel trained in human rights policies or procedures	IVL website	-

GRI Standard Disclosures	Disclosure Title	Page Number (Annual Report: AR / Sustainability Report: SR)	External Assurance
Rights of Indigenous Peoples			
411-1	Incidents of violations involving rights of indigenous peoples	SR p. 60-61 / IVL website	-
Human Rights Assessment			
412-1	Operations that have been subject to human rights reviews or impact assessments	SR p. 60-61 / IVL website	-
412-2	Employee training on human rights policies or procedures	SR p. 60-61 / IVL website	-
Local Communities			
413-1	Operations with local community engagement, impact assessments, and development programs	SR p. 69-77 / IVL website	-
Supplier Social Assessment			
414-1	New suppliers that were screened using social criteria	SR p. 60-61 / IVL website	-
Public Policy			
415-1	Political contributions	SR p. 26 / IVL website	-
Customer Health and Safety			
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	SR p. 31	-
Marketing and Labeling			
417-3	Incidents of non-compliance concerning marketing communications	SR p. 31	-
Customer Privacy			
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	SR p. 31	-
Socioeconomic Compliance			
419-1	Non-compliance with laws and regulations in the social and economic area	SR p. 31, 61	-

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