

Capitals Linked in this Chapter







Manufactured Capital



Social and **Relationship Capital**

Value Created

We are focused on reducing our consumption of natural resources, improving our operational efficiencies and using more renewable energy at all of our projects and sites to support the environment in the communities where we operate.

Our Ambitions for a Better Environment



Short-Term (2021 - 2024)

- Set Science-Based Targets (SBTs)
- Set the Scope 3 GHG emissions target
- No major cases of environmental non-compliance



Medium-Term (2025)

- 10% reduction in combined GHG (Scope 1 and 2) intensity*
- Renewable electricity 10% by 2025 and 25% by 2030
- 5% reduction in energy intensity*
- 10% reduction in water intensity*

90% waste diverted from

landfill * Base year 2020



Long-Term (2050)

- Towards A Circular Economy
- Towards Carbon Neutrality
- continuously reducing our carbon footprint
- > improving operational eco-efficiency
- > procuring renewable and low carbon intensive energy
- optimizing natural resource consumption

We are on track to deliver on our 2025 medium-term strategy in support of our longer-term 2050 ambitions. Acquisitions are integral to our growth agenda; in 2020, we increased the reporting scope from 94 to 107 sites. We have driven reductions across the 2019 scope for GHG, energy and waste, demonstrating greater operating efficiencies despite organic growth of 5%. Data for 2020 encompasses a number of new high intensity plants acquired in 2020 reflecting inorganic growth of 18% and shows an increase in overall intensities. We will continue to integrate best practice consumption and optimization initiatives in our newly acquired plants to drive down emissions in support of our targets.

Decarbonization in our Value Chain







With a focus on creating value for our people and the planet, we have set a long-term target to become carbon neutral and are confident of achieving it driven by our 2025 Climate Strategy.

We apply a diversified approach in reducing our GHG emissions. Decarbonizing our operations and value chain means working with suppliers, contractors, partners and customers to find solutions. It also means remaining innovative and seeking efficiencies wherever possible.





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^{*} We changed our baseline year for our 2025 targets from 2019 to 2020 to reflect significant acquisitions during 2020; please refer to the Sustainability Ambitions section on pg. 24 for more details.

Our Decarbonization Strategies

In order to decarbonize our carbon footprint in our operations and value chain, we are exploring a diverse portfolio of solutions including new ideas and working with others to drive innovation. IVL is exploring a combination of the following decarbonization strategies:



Improving operational efficiency

Invest in operational and energy efficiency to reduce emissions in our operations



Renewable **Electricity**

Decarbonize IVL's energy consumption via onsite vs. offsite renewable energy development



Recycling

Invest in and expand recycling facilities to address plastic pollution and reduce lifecycle carbon emissions



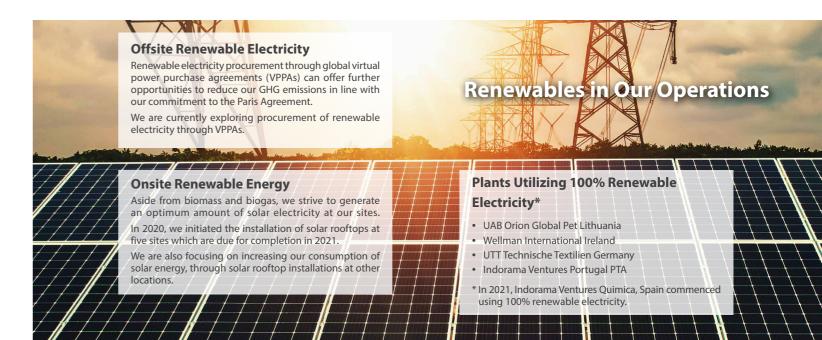
Natural **Capital Solutions**

Explore partial/ full ownership of carbon offsetting projects



Future Technologies

Explore opportunities for Carbon Capture Utilization and Storage (CCUS), green hydrogen, bio/renewable feedstock, Renewable Natural Gas (RNG)



Net-Zero Challenge: The supply chain opportunity

Mr. Yash Lohia, Chief Sustainability Officer at Indorama Ventures, is featured in the newest report on "The Supply Chain Opportunity". It outlines how tackling supply chain emissions can be a game-changer to climate action and what CEOs can do to take action, launched by the World Economic Forum and Boston Consulting Group.



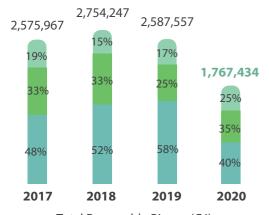


Innovative Solar Fencing In late 2020, Orion Global PET in Lithuania installed a 57kW solar fence in place of a conventional fence, enabling both a site boundary and electricity generation. This innovative fencing design maximizes renewable energy production by utilizing the most efficient placement of solar panels within a limited space. The project is expected to generate 55.82 MWh of renewable electricity per year bringing total solar energy capacity at the site to 390,000 kWh.

Harnessing Renewable Energy

We are actively reducing our reliance on conventional energy and increasing our use of renewable energy sources such as solar energy, biomass, biogas and renewable natural gas. We continue to seek ways to reduce our carbon footprint in support of our ambition to be carbon neutral and in line with the UN SDGs.

Total Renewable Energy Consumption



- Total Renewable Biogas (GJ)
- Total Renewable Biomass (GJ)
- Total Renewable Electricity (GJ)

2025 Target

10% renewable electricity consumption

2030 Target

25% renewable electricity consumption

In 2020, our combined use of 1,767,434 GJ of renewable energy saved over 87,227 tCO,e.

We are working to achieve 10% renewable electricity consumption by 2025 and 25% by 2030. Though there was a decline in 2020, we continue to focus on adopting renewable electricity and are on track to achieve our targets.

GHG Strategies

We remain committed to reducing greenhouse gas emissions from our operations and are focusing on the entire value chain when looking for ways to improve resource productivity. In line with our Climate Strategy 2025 and the UNGC Communication on Progress (COP), we continue to develop low-carbon alternatives and find ways to reduce our environmental footprint. In 2020, we developed a Climate Strategy Corporate Standard that underpins the steps which all of our global operations must take to manage GHG emissions. This standard outlines key actions and KPIs towards achieving our sustainability ambitions and carbon neutral targets. We changed our baseline year for our 2025 targets from 2019 to 2020 to reflect significant acquisitions during 2020.

* Base year 2020

GHG (Scope 1&2) Intensity Targets

2020 Performance:

0.607 tCO₂e / ton of production GHG (Scope 1& 2) intensity **5.6%** reduction in combined GHG (Scope 1& 2) intensity compared to the 2019 reporting scope

2013-2020 Progress:

10% reduction in combined GHG (Scope 1& 2) intensity



2025 Target :

10% combined GHG (Scope 1&2) intensity reduction*

For More Information

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GHG Reductions Across our Value Chain

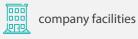
In our Operations

Driving operational eco-efficiencies across our sites

Scope 1

production plants







production

Reporting Company

Scope 1: Direct

Greenhouse gas emissions from sources that are owned or controlled by a company.

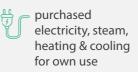
Direct GHG Emissions

2017 2018 2019 2020

GHG Reduction through Business Partnerships

Collaborating towards efficiencies in new technologies such as recycling.

Scope 2





- Location-based $= 0.155 \text{ tCO}_{2}\text{e/ton of}$ production
- Market-based $= 0.156 \text{ tCO}_{2}\text{e/ton of}$ production

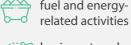
Upstream Activities

Scope 2: Indirect

Greenhouse gas emissions resulting from the electricity purchased by a company.

Scope 3





business travel and employee commuting = 35,777 tCO₂e



transportation, and distribution = 1,294,303 tCO₂e

Electricity = 307,549 tCO₂e

Fuel = 939,869 tCO₂e

Upstream Activities

Upstream &

Total GHG Emissions

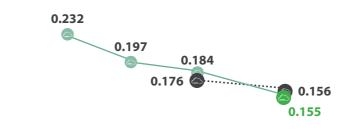
2017 2018 2019 2020

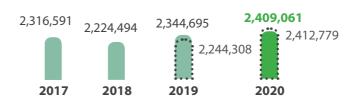
Scope 3: Indirect

Greenhouse gas emissions from sources not owned or directly controlled by a company but related to the company's activities.

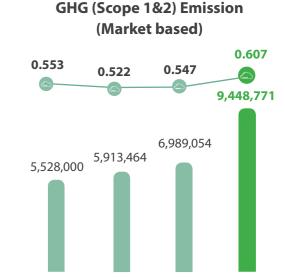
Routinely and consistently keeping track of greenhouse gas emissions from our operations is key to identifying reduction measures and their thorough implemention. Through cloud-based software, we collect and analyze GHG data on a monthly basis. We calculate direct and indirect greenhouse gas emissions (GHG Scope 1, 2 and 3) for our global operations through established international standards in line with the GHG Protocol on Corporate Accounting and Reporting. This includes the World Resources Institute (WRI), World Business Council for Sustainable Development and ISO 14064-1/ISO 14064-3.

GHG (Scope 2) Emission





- Emission (tCO₂e)-Location based ::: Emission (tCO₂e)-Market based - Intensity (tCO_e/ton of production) - Intensity (tCO_e/ton of production)
 - -Location based -Market based



■ Total GHG Scope 1 and Scope 2 (tCO₂e)-Market based Total GHG Intensity Scope 1 and Scope 2 (tCO₃e/ton of production)-Market based

2019

2018

2017

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

> For More Information

2020

(Scope 1) (Scope 1 & 2) - Location based (Scope 2) 0.452 0.232 0.553 0.522 0.555 0.197 0.184 0.169 0.371 0.321 0.325 0.524 0.355 0.155 9,445,053 7,035,992 7,089,441 5,913,464 4,744,746 5,528,000 3,688,970 3,211,409 2,344,695 2,316,591 6,777,344 2,409,061 2.224.494 4,597,960 2,179,384

Indirect GHG Emissions

Note: Intensities are calculated based on overall production including inter-company sales. 2020 emissions has increased as IVL acquired cracker plants, which resulted in higher GHG emissions.

2017 2018 2019 2020

■ GHG emissions (tCO₂e) - 2020 Reporting Scope (107 sites) - Intensity (tCO₂e / ton of production) - 2020 Reporting Scope (107 sites)

GHG emissions (tCO₂e) - 2019 Reporting Scope (94 sites) - Intensity (tCO₂e / ton of production) - 2019 Reporting Scope (94 sites)

Gas Turbine Apollo Project - New Cogeneration Plant at PTIVI, Indonesia

PT. Indorama Ventures (PTIVI) Indonesia commissioned two 7.5 MW gas turbines with two additional absorption chillers with 2,937 TR capacity from both waste heat and hot water recovery. This unit was installed along with two new HTM boilers using waste heat from turbines. This unique project, with heat recovery at three different stages, is the first time at IVL that the cogeneration plant process will run using waste heat from turbine exhaust. This project, with a total investment value of US\$28 million, will achieve an annual GHG reduction of approximately 30,000 tons. The expected CO₃ savings will be roughly 25% for the whole site.



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As a Low-Carbon Manufacturing Role Model in the Eastern Economic Corridor

TPT Petrochemicals PCL, a subsidiary of Indorama Ventures Public Company Limited (IVL), the first producer of purified terephthalic acid (PTA) in Thailand, received an honorable trophy of being one of the low-carbon manufacturing role models. This recognition was given under the Development of Low carbon Industry for supporting Greenhouse Gas Mitigation in Eastern Economic Corridor Project (Low Carbon EEC).

This reflects the company's dedication to enhance production efficiency that results in lower greenhouse gas emissions. This is also in line with its commitment to leverage efficient resource consumption through recycling, lower carbon footprint and increase the use of renewable energy which will have a positive impact on sustainable development in the long term.



Carbon pricing mechanisms are increasingly being accepted as a cost-effective approach to managing climate change. Understanding carbon pricing and reflecting this in our strategic business planning is key to being a responsible operator.

IVL also measures climate-related regulatory risks through financial impact modelling. Our Carbon Pricing Impact Model forecasts the annual payments IVL makes towards emissions trading schemes (ETS) worldwide.

The results of the model indicate that IVL's compliance costs are projected to increase from less than US\$10 million over the previous decade to between US\$120 - 170 million over the next decade, with US\$20 million of the figure expected from new ETS expected to come into operation. ETS coverage is also expected to rise from 8% of IVL's Scope 1 emissions in 2020 to 37% by 2030 based on current production.





TCFD Reporting

In July 2020 we became the first chemical company in Thailand and the second chemical company in Southeast Asia to become a TCFD Supporter. We are guided by the TCFD's recommendations in providing our climate-related financial disclosures.

Our Climate Focus on

- Operational eco-efficiency
- Recycling
- Onsite and offsite renewable electricity
- Setting up Science-Based Targets (SBTs)
- Digitalization
- Carbon neutrality
- Adoption of future technologies (Carbon Capture Utilization and Storage (CCUS) technology and green hydrogen)
- Carbon offsets
- Natural Capital Valuation (NCV)

Governance

IVL's Board integrates climate risk and opportunity management across the Company and links executive compensation to sustainability and ESG performance. The SRMC evaluates sustainability and risk-related issues, advises the Board and executes its directives. The Chief Strategy Officer, Chief Sustainability Officer and Group Chief Technical Officer of respective businesses oversee the implementation of ESG initiatives throughout IVL. In addition, our Sustainability Champions formulate and drive initiatives to ensure best practices are in place.

Strategy

Our strategy towards climate change includes support for external initiatives as well as internally setting overarching sustainability targets. We are proud to support the Paris Agreement which sets out nationally determined contributions (NDCs) to reduce GHG emissions. We are taking the necessary steps to set our targets for GHG emissions in line with the SBTi and are working towards setting our SBTs by 2024.

Risk Management

Our approach to risk management is based on the enterprise risk management (ERM) framework, which is comprehensive and embedded across our corporate and global subsidiaries, with continual information flows from both top-down and bottom-up. As part of the ERM framework, we assess risks and opportunities associated with climate change and adapt our approach accordingly.



Our Risk Assessment Tools

- We considered the IEA Stated Policies Scenario (STEPS) and IEA Sustainable Development Scenario (SDS) for financial analysis.
- We examine current and projected climate related issues via WRI's AQUEDUCT Water Risk Analysis, Climate Resilience Evaluation & Awareness Tool (CREAT) and the Climate Information Portal (CLIPC).

Metrics and Targets

Our plants around the world work with bespoke GHG reduction plans, implemented with the use of renewable energy, ensuring that projects are energy efficient through close monitoring of energy consumption. These actions are supported by IVL's head office and monitored by senior management. Our 2025 sustainability goals related to environmental performance are summarized on pg. 24.

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Environmental Management











We are conscious of the impact we may have on the environment given our global operations as well as the nature of our business. Our immediate focus is on efficiency - by continuously improving our internal processes and managing our energy consumption. This reduces our environmental footprint and contributes to our goal of becoming carbon neutral by 2060.

Energy Management

We changed our baseline year for our 2025 targets from 2019 to 2020 to reflect significant acquisitions during 2020; we remain committed to our 2025 target of reducing our energy intensity by 5% compared to the 2020 baseline. In order to become carbon neutral, we continue to drive diverse and multiple energy savings initiatives throughout the business. Our increasing focus on energy efficiency enables us to be more competitive by reducing our energy costs, minimizing our impacts and contributing to a lower-carbon economy. Further information is available in our Global Performance Data section on pg. 119.

Energy Intensity Targets

2020 Performance:

6.73 GJ/ton of production

3% reduction in energy intensity compared to the 2019 reporting scope

2013-2020 Progress:

4% reduction in energy intensity



2025 Target :

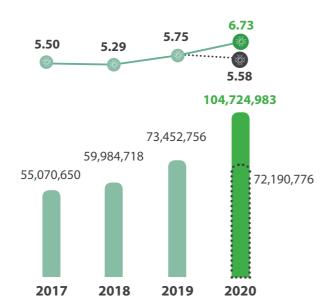
* Base year 2020

5% energy intensity reduction*





Total Energy Consumption



- Total consumption (GJ) 2020 Reporting Scope (107 sites)
- Total consumption (GJ) 2019 Reporting Scope (94 sites)
- Intensity (GJ / ton of production) -2020 Reporting Scope (107 sites)
- · Intensity (GJ / ton of production) -2019 Reporting Scope (94 sites)

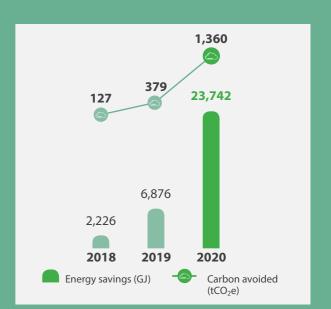
Note: Intensities are calculated based on overall production including inter-company sales.

2020 energy has increased as IVL acquired cracker plants, which resulted in higher energy consumption.

Waste Heat Recovery and Utilization

Optimizing our systems to reduce carbon emissions and energy consumption is integral to reaching our 5% energy intensity reduction by 2025. In support of these reductions, our Trevira Bobingen site in Germany has been utilizing waste heat exchangers. Heat generated by air compressors is recycled and used within the manufacturing process to preheat boiler feed water and finish dip baths. This technology avoids the use of steam for heating purposes, minimizes energy consumption and avoids carbon emissions, bringing us closer to becoming carbon neutral.

In addition to optimizing existing sites, we continuously share best practices and implement positive changes in our operations.



Water Management

We recognize that some of our sites operate in water stressed environments. Effective water management ensures that we operate responsibly while mitigating any negative impacts to the people and environment surrounding our operations. To ensure accountability in the area of responsible water management, we continue towards our 2025 goal of 10% water intensity reduction compared to the 2020 baseline.

Water Intensity Targets

2020 Performance:

5.31 m³ / ton of production

10% reduction in water intensity compared to the 2019 reporting scope

10% increase in volume of recycled/reused water over 2019

2013-2020 Progress:

7% reduction in total water intensity



2025 Target:

10% water intensity reduction*

We comply with all environmental laws, international standards and regulations in the countries where we have operations. Our Global Corporate Water Management Policy and Strategy outlines how we manage our water sustainably, including water withdrawal and discharge. Underpinned by our values such as embracing change and growing responsibly, this Policy and Strategy is part of IVL Group's EHS policy and enables us to explore new ways to go beyond compliance. In 2020, we began reporting our water consumption and water discharge metric based on the new version of GRI's reporting standards. Further information is available in our Global Performance Data section on pg. 120.

We continuously pursue improvements in water management through process efficiencies and technology enhancements. The 3Rs define our approach, in conjunction with building wastewater treatment plants and reducing the use of freshwater in our operations.



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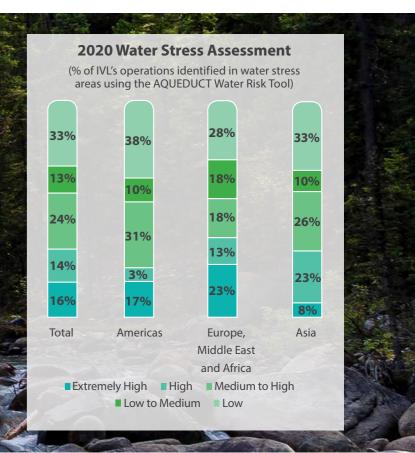
Water Risk Management

Water Sensitivity Analysis

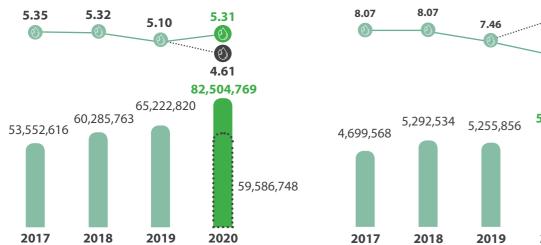
We conducted a water sensitivity analysis using the AQUEDUCT Water Risk tool developed by WRI to identify water stress locations in 2020.

Utilizing WRI's AQUEDUCT Water Risk Tool to:

- Evaluate changes in water demand, water supply, stakeholder risk, and regulations based on current and future conditions.
- Foresee changes to water risk forecasting in 2020, 2030 and 2040.
- Discuss assessment results during risk assessment committee meetings on a yearly basis.
- Identify mitigation measures and initiatives for plants located in areas facing extreme water stress or significant risks to water usage.

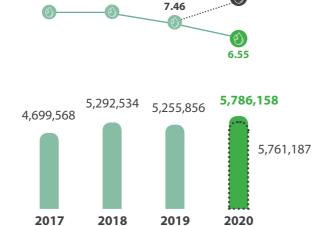


Total Water Withdrawal



- Total water withdrawal (m³) -2020 Reporting Scope (107 sites)
- Total water withdrawal (m³) -2019 Reporting Scope (94 sites)
- Intensity (m³ / ton of production) -2020 Reporting Scope (107 sites)
- · O · Intensity (m³ / ton of production) -2019 Reporting Scope (94 sites)

Total Recycled/Reused Water



- Total volume of recycled/reused water (m³) - 2020 Reporting Scope (107 sites)
- Total volume of recycled/reused water (m³) - 2019 Reporting Scope (94 sites)
- Recycled/Reused water (%) - 2020 Reporting Scope (107 sites)
- · Recycled/Reused water (%) - 2019 Reporting Scope (94 sites)

Note: Intensities are calculated based on overall production including inter-company sales. 2020 water has increased as IVL acquired cracker plants, which resulted in higher water withdrawal. Effective water management is a critical risk that we must manage across our operations, and we acknowledge that each site works within a unique operating context. The AQUEDUCT Water Risk tool combines 12 indicators to create a clear picture of relative water risks, total water available and total withdrawal. Through this tool, we conduct local water risk assessments and regularly assess both limitations and opportunities related to water.

Waste Management

We continue to reduce waste from our operations in line with our goal of diverting waste from landfill with an approach to waste management that complies with regulatory requirements and exceeds them where possible.

Reducing waste also means applying responsible principles throughout the value chain; we seek sustainable vendors that reuse, recover or recycle. We also work hard to ensure that our hazardous waste is handled appropriately, conducting site visits of key vendors ensuring their waste management standards comply with local regulations. Further information is available in our Global Performance Data section on pg. 120.

As part of our integrated risk analysis, EBITDA and the financial impact on revenue and cost of goods sold are discussed annually during management meetings which result in the development of action plans and remedial activities where nescessary. Individuals based at each of our operating plants are designated as water champions to coordinate an integrated approach and ensure regular reporting to management. Further information is available in our 2020 Annual Report on pg. 130.

Waste Intensity Targets

2020 Performance:

0.0202 tons/ton of production

17% reduction in total hazardous waste intensity compared with the 2019 reporting scope

2013-2020 Progress:

Total waste diverted from landfill increased from 48% to 84%



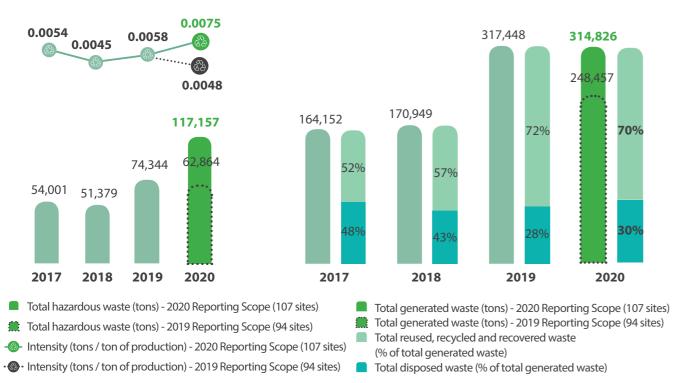
2025 Target:

90% Waste diverted from landfill

Total Hazardous Waste

Total Waste

Generated, Disposed, Reused, Recycled and Recovered



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

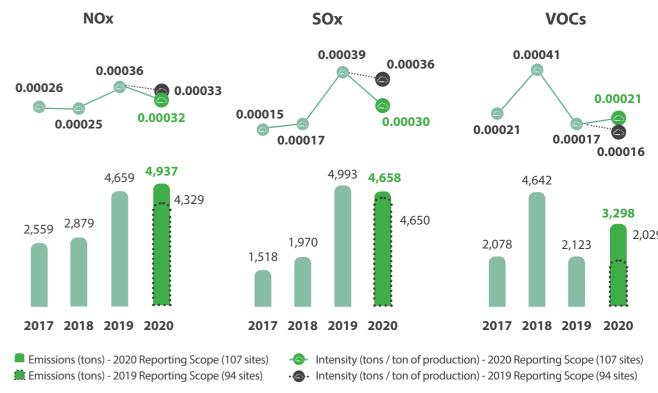




Air Emissions Management



We closely monitor and minimize our air emissions ensuring compliance with laws and regulations and to improve our emissions standards. Further information is available in our Global Performance Data section on pg. 120.



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

Process improvements to reduce air and water pollutants

Indorama Petrochem Limited (PET)'s plant in Rayong, Thailand continues to demonstrate strong stakeholder engagement and significant process optimizations. In end of 2019, the plant installed the stripping column to reduce the COD/BOD in wastewater prior deliver to wastewater treatment plant. In additional, the catalytic incinerator was installed in order to remove the off gas from process.

In 2020, Electrostatic Precipitators (ESP) were used to replace the cyclonic separation process for particulate collection. This initiative reduced total suspended particulates by 91% and reduced the NOx emissions rate by 29%.

These actions demonstrate IVL's solutions that meet or exceed stakeholder expectations.



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Strong Environmental Governance

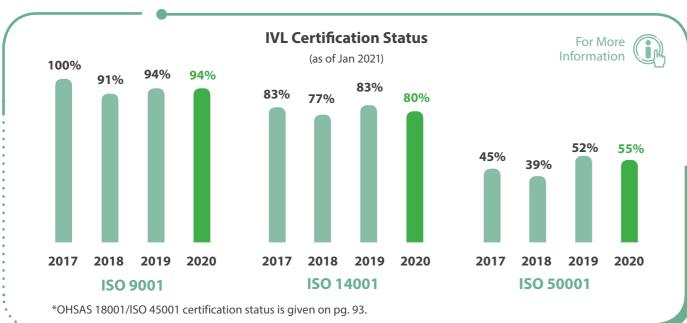
Environmental Management System

We have robust internal mechanisms that guide IVL's environmental best practices across our value chain and strive to maintain zero material non-compliance issues to protect the environment within the communities where we operate. We remain apprised and supportive of legislation that promotes environmental sustainability.

Our Environmental Management System (EMS) is based on the ISO 14001 standard. It offers a comprehensive framework for improving environmental performance, lowering business costs, building a marketing advantage and demonstrating environmental leadership. Integral to the planning and implementation of our environmental protection measures, it also ensures that we set targets for renewable energy procurement for GHG emissions reductions and meet our environmental commitments and policy requirements. We were unable to achieve our target of ISO certification due to Covid-19 pandemic restrictions.

Our EMS empowers employees by providing them with opportunities to increase awareness of environmental issues and responsibilities. It also enables us to leverage internal environmental knowledge, enhance morale and build credibility with our stakeholders.

Our corporate values outline a commitment to responsibly pursue business growth and profitability, with due consideration of economic, environmental and social factors. Our Environmental Policy aims to protect and enhance the environment around us and applies to the Board of Directors, management, employees, trainees and those authorized to act on behalf of or represent the Company. It also provides criteria which we apply in conducting due diligence prior to mergers and acquisitions and when planning greenfield projects and expansions. Comprehensive environmental compliance standards throughout IVL ensure that our operations comply with applicable environmental laws, regulations and standards in the countries where we operate.



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.

In 2020, there were no incidents of major regulatory non-compliance (greater than US\$100,000). However, there were the following two cases at our plants in the Netherlands and the United States respectively:

- Distribution of plastic scraps outside the premises (US\$590 penalty).
- VOCs and Hazardous Air Pollutants (HAPs) released (US\$22,357 penalty).

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. We are currently implementing a regulatory compliance system to provide better visibility to regulatory requirements and real time compliance status reports at every operating location.

Operational Excellence Awards

Our annual Operational Excellence Awards recognize employees, teams and Business Units for outstanding financial, operational and sustainability performance achievements. Bringing attention to these successes not only enhance employee engagement but provides a platform for sharing best practices and showcasing best-in-class results. Business Units benchmark performance against ten criteria within the above-mentioned categories and winners are awarded at the annual Global Management Conference (GMC).



















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