



Water Risk Assessment Summary Report 2024



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Introduction

Water is a critical resource for the chemical industry, underpinning nearly every aspect of production, processing, and support operations. Water-related risks are multifaceted and evolving, with intricate interplay between physical realities, regulatory pressures, business imperatives, and stakeholder perceptions. Indorama Ventures proactively manages the risk —anchored in risk assessment, operational innovation, and transparent engagement—will be essential to thrive in a world where water is increasingly scarce, valuable, and contested. By turning water risk into an opportunity for leadership, the industry can secure its future while contributing to sustainable resource stewardship for society at large.

As global water challenges intensify, we must proactively understand, assess, and manage these risks to ensure long-term resilience and sustainable growth. Indorama Ventures is working globally to reach our goals of reducing water use by 10% by 2025 and 20% by 2030 from the 2020 baseline. We openly share our water data and management and try to keep improving our water performance.

We used the AQUEDUCT 4.0 Water Risk tool developed by WRI and the ENCORE tool developed by UNEP-WCMC and partners to perform a comprehensive water sensitivity analysis for current and future scenarios. These tools combine various indicators of water risk, availability, withdrawal, dependency, quality, and ecosystem services to provide a holistic picture of our water-related impacts and dependencies across our operations and value chain. Based on these tools, we further conduct regular local water risk assessments and identify both the challenges and opportunities for water management and integrate it to our Climate Adaptation Plan. We continued to monitor and analyze its effects while estimating the expenditures that would be incurred if this scenario were to occur based on the production, water, and cost of goods sold figures from 2024

As a responsible corporate citizen, we engage with the local communities where we operate, participate in multi-stakeholder initiatives, and are considering a more all-inclusive approach that better includes all our relevant stakeholders along the value chain. Active participation in policy dialogues and water basin management initiatives helps companies anticipate regulatory changes and influence the development of practical, science-based standards. Collaboration with industry peers, NGOs, and governments fosters shared solutions to water challenges and can build resilience across entire industrial clusters.

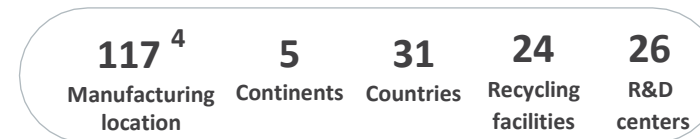
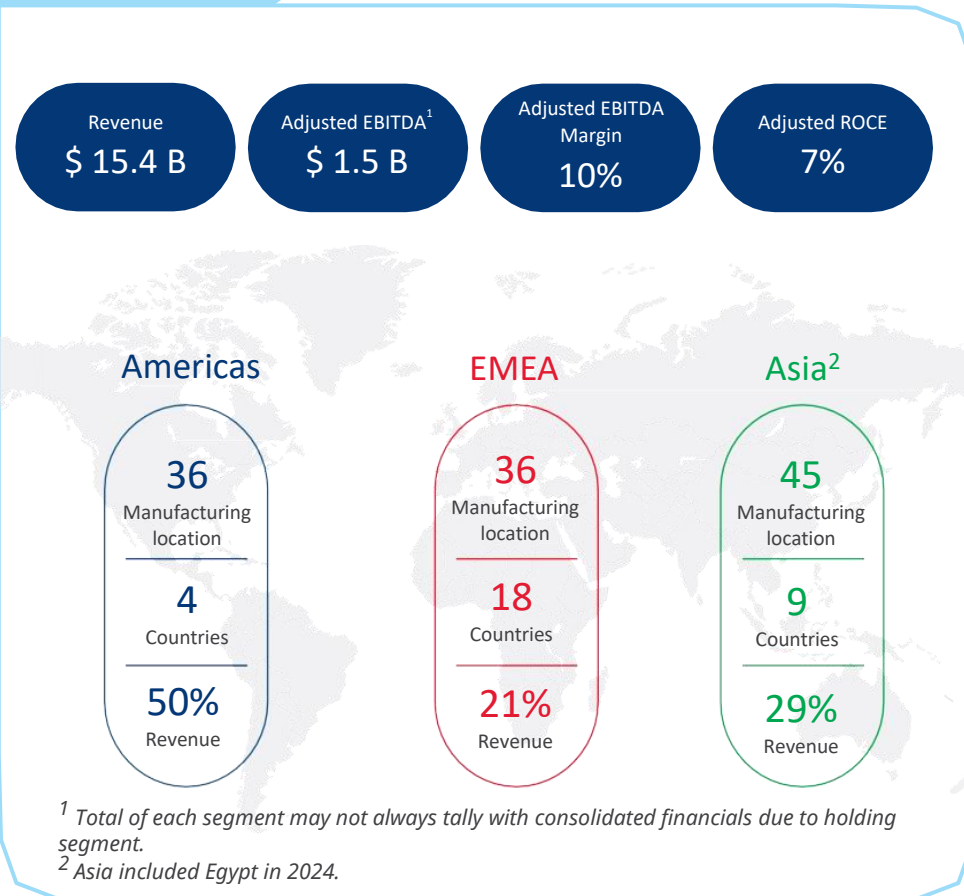
Through the prioritization of water resources and dedication to the conservation of water and biodiversity, effective water management, and responsible wastewater discharge, these initiatives are significantly advancing the achievement of SDG 6: Clean Water and Sanitation.



Indorama Ventures at A Glance

Indorama Ventures is a world-class sustainable chemical company and a global integrated leader in PET and fibers serving major customers in diversified end-use markets. In following our core strategies, we develop innovative products that meet the needs of our customers, making great products for society.

At a Glance



³ This number includes both permanent and temporary employees.
⁴ The Sustainability Report 2024 consists of data from 150 sites. Further details can be found in the full Sustainability Report 2024 (under "About this Report").

Our Differentiation

- 70% of our products serve daily necessities.
- Leadership positions across all major markets and products we manufacture.
- Best-in-class management.
- A world-class digital and AI platform.

Water Risks Globally and to Indorama Ventures



Water is a very essential and important natural resource for all life functions on Earth. It sustains the functioning of human health, ecosystems, food security, energy supply, and human habitats.

However, water resources are facing multiple pressures from population growth, urbanization, industrialization, climate change, and pollution. The water crisis (water stress, droughts, floods, and a rise in sea levels) is a growing concern around the world.

Indorama Ventures is committed to sustainable water management. As our operations are water-reliant, water risk can detrimentally affect our business. The water risk analysis, therefore, helps us identify both water risks and opportunities at all our operating sites and ensure the most efficient water consumption.

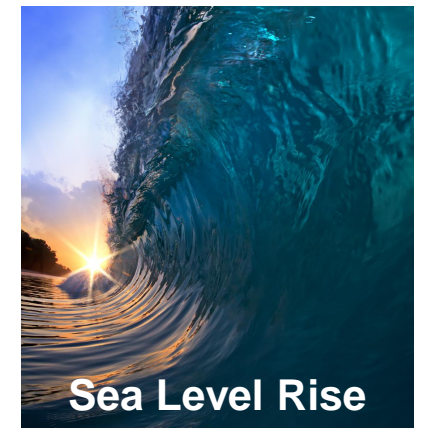
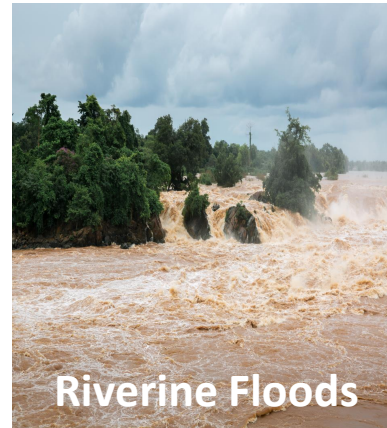
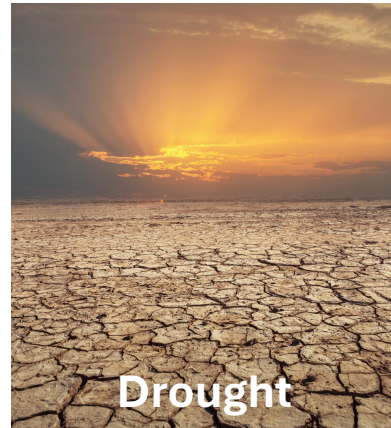
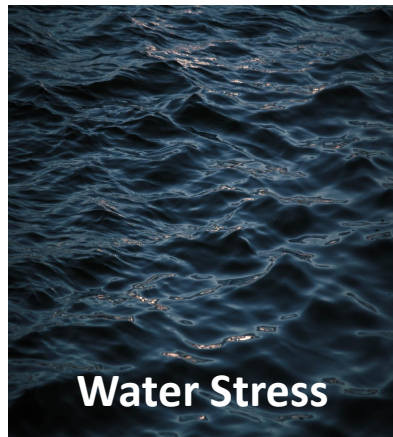
We practice responsible and sustainable water management in our operations, in addition to ensuring compliance with all applicable legislation. Governments, businesses and communities must adopt a more responsible approach to water consumption and sustainable water management practices to solve the global water crisis.



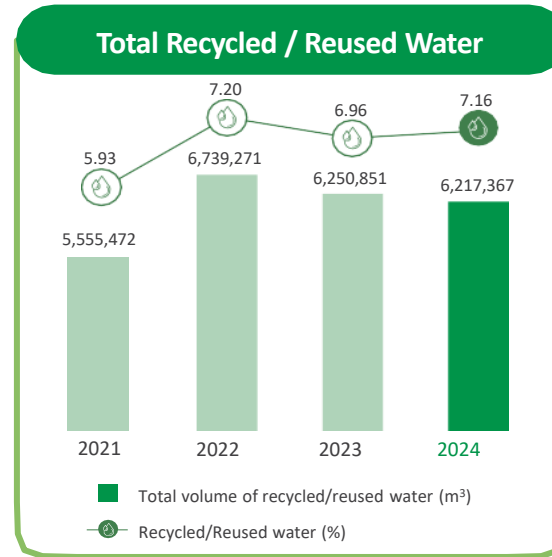
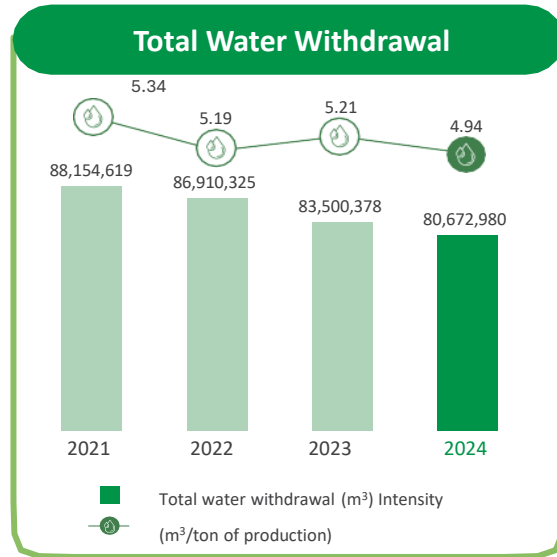
Objective of This Report

We analyzed the latest water status across Indorama Ventures' global network using the WRI AQUEDUCT water tool to address the following:

- Status in current water stress (2024) and Change in future water stress (2030)
- Status in current drought (2024)
- Status in current riverine floods (2024)
- Status in current coastal floods (2024)
- Status in current sea level rise (2024)



2024 Indorama Ventures' Water Performance



Water Intensity Reduction (2020 Baseline)

Targets

10% by 2025 and
20% by 2030

Performance

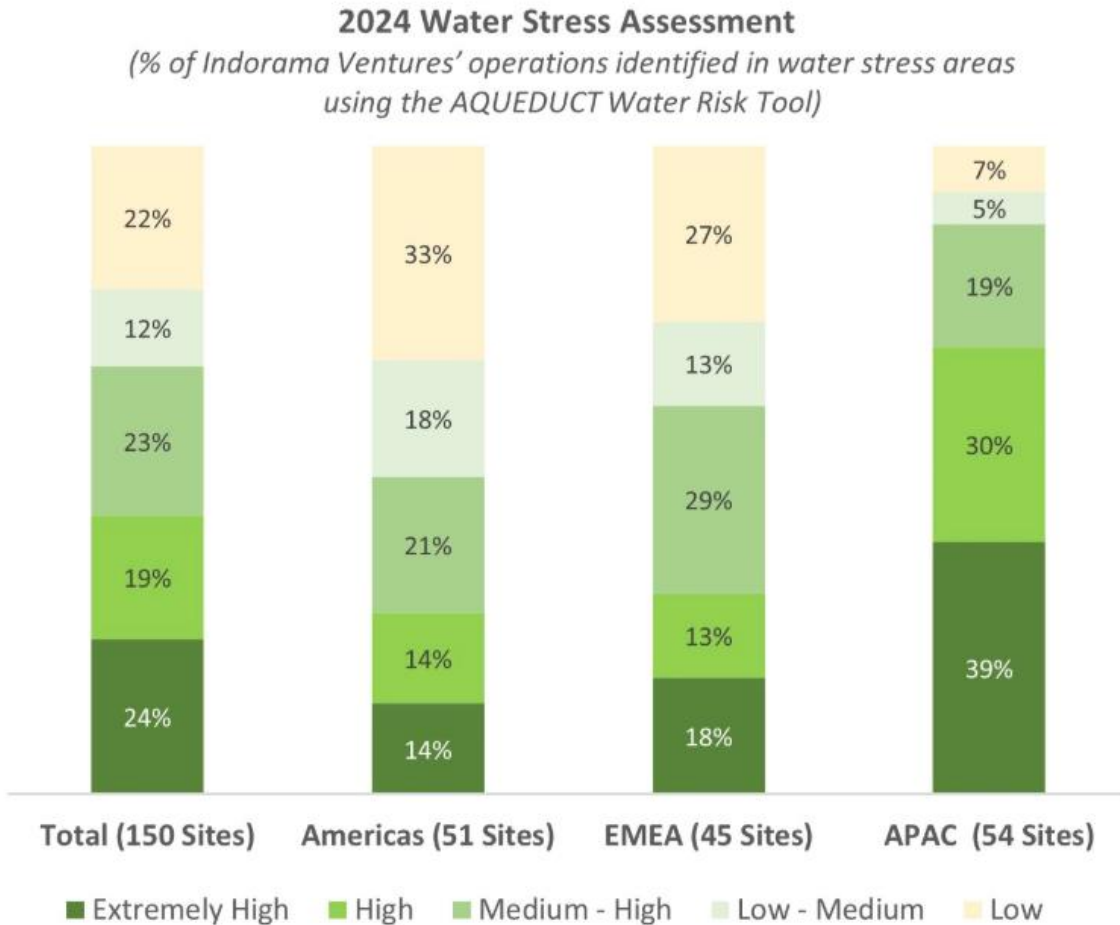
In 2024, we recorded a water intensity of 4.94 m³/ton of production, showing a 6.44% reduction against the 2025 target.

2024 HIGHLIGHTS

6 sites have achieved Zero Liquid Discharge

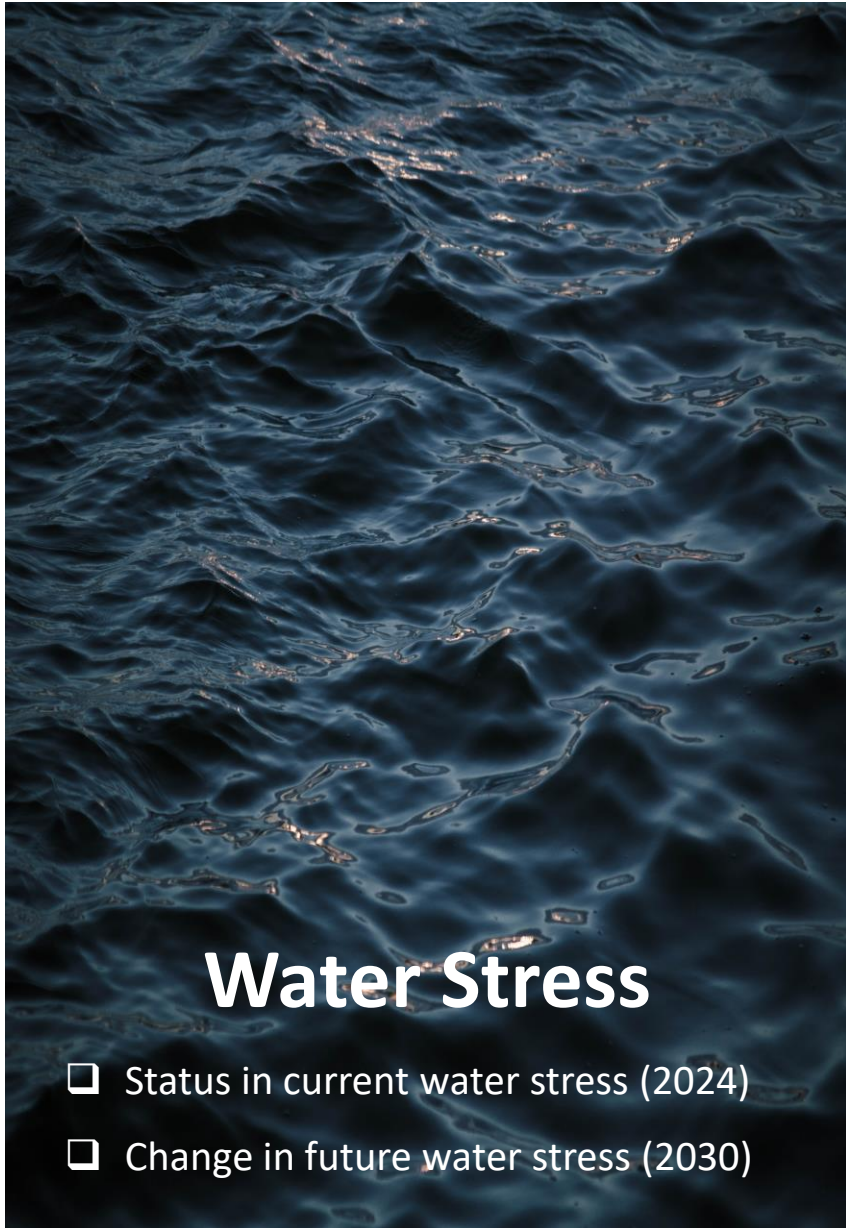
- Avgol Nonwovens India Private Limited (Halol site)
- Indorama Petrochem Limited (PET)
- PT. Indorama Ventures Indonesia (PET)
- PT. Indorama Ventures Indonesia (Fibers)
- Schoeller Kresice s.r.o
- IVL Dhunseri Petrochem Industries Private Limited (Karnal site)

Summary Water Risk Analysis 2024



Numbers of Sites	Water Stress		Drought	Coastal flood	Riverine Flood
	2024	2030	2024	2024	2024
Extremely High	36	40	-	10	26
High	29	34	3	15	22
Medium – High	34	32	69	14	16
Medium	-	-	64	-	-
Low - Medium	18	11	11	18	29
Low	33	33	-	93	57
Total Sites	150	150	147*	150	150

*3 sites data are not available



Water Stress

- Status in current water stress (2024)
- Change in future water stress (2030)

Summary

No. of Sites in each water stress level	Water Stress		Regions (2024)
	2024	2030	
Extremely High	36	40	EMEA (8), The Americas (7), APAC (21)
High	29	34	EMEA (6), The Americas (7), APAC (16)
Medium – High	34	32	
Low to Medium	18	11	
Low	33	33	
Total	150	150	

Impacts to Indorama Ventures in each water stress level	Production Compared to Indorama Ventures’ total production	Water Withdrawal Compared with Indorama Ventures’ total Water
Extremely High	3.35 million tons (20.51%)	8.94 million m³ (11.08%)
High	3.60 million tons (22.04%)	20.02 million m³ (24.82%)

NOTE: Indorama Ventures total production in 2024 = 16.35 million tons (including intracompany sales), 14.04 million tons (excluding intracompany sales) and Indorama Ventures total water withdrawal = 80.67 million m³

Potential risk from production loss = 6.95 million tons (42.55%)
Estimated 2024 EBITDA loss from plant shutdowns = at least \$ 183.77 million
(due to water shortages at extremely high and high risk sites and shutdown for 90 days)

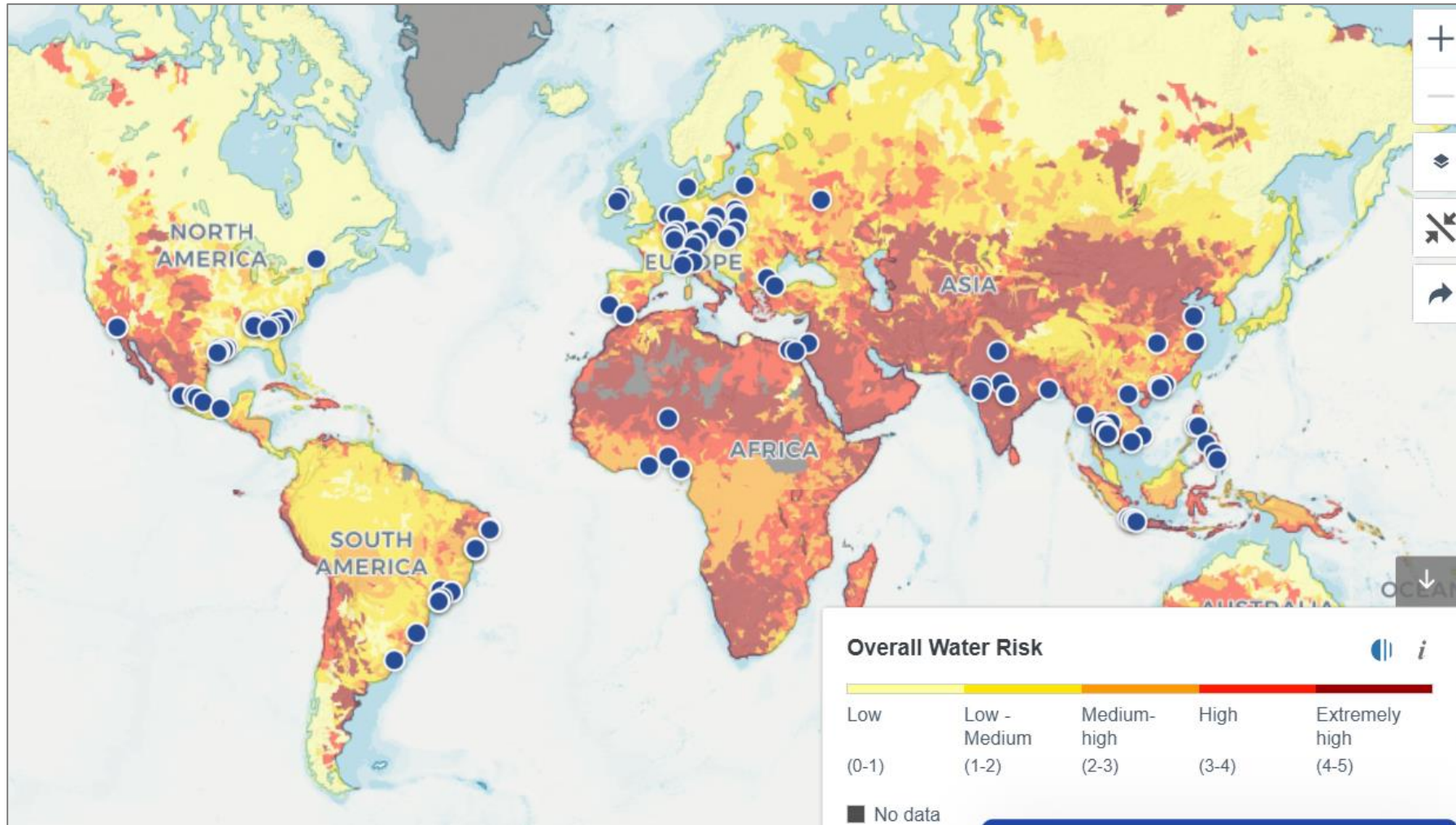


Indorama Ventures : Current Condition - 2024

No. of Manufacturing Sites
150

2024 Water Consumption
80.67 million m³

2024 Water Cost
\$ 35.99 million



Estimated impacts to Indorama Ventures in 2024 – from extremely high and high stress areas

In 2024, the effects of water scarcity were nonexistent. However, we continued to monitor and analyze its effects while estimating the expenditures that would be incurred if this scenario were to occur based on the production, water, and cost of goods sold figures from 2024.

2024 Water Cost
\$ 15.99 million (44.43%)
 (out of total water costs
 = \$ 35.99 million)

Estimation of Production
 Subject to risk of Loss (Actual no loss)
6.95 million tons (42.55%)
 (out of Indorama Ventures' total production = 16.35 million tons)

Cost of Goods Sold (COGS)
 Subject to risk of Loss (Actual no loss)
\$ 7.46 billion, 42.50%
 (out of Indorama Ventures' COGS
 = \$ 17.55 million)

		Estimated EBITDA Loss <i>based on the current 2024 water stress assessment</i>		
Stress Level	No. of sites	30 days shutdown (\$ million)	60 days shutdown (\$ million)	90 days shutdown (\$ million)
(A) Extremely High	36	29.56	59.12	88.68
(B) High	29	31.70	63.39	95.09
Subtotal (A) + (B)	65	61.26	122.51	183.77
Total (all stress levels)	150	123.28	246.56	369.84

NOTE: Indorama Ventures total production in 2024 = 16.35 million tons (including intracompany sales), 14.04 million tons (excluding intracompany sales)

Estimated impacts to Indorama Ventures in 2030

PROJECTION – 2030 Water Cost

2024 Water Cost
\$ 35.99 million

2030 Estimated Water Cost
\$ 45.79 million

% of Increase
↑ 27.20%

Stress Level	# Sites	% of sites	Estimated Water Cost 2030 (\$ million)
Extremely High (>80%)	36	24%	6.33
High (40-80%)	43	29%	21.89
Medium High (20-40%)	27	18%	9.20
Low-Medium (10-20%)	12	8%	3.36
Low (<10%)	32	21%	5.01
Total	150	100%	45.79

2030 Water Cost Projection	
Extremely High (>80%)	74%
High (40-80%)	44%
Medium High (20-40%)	4%
Low-Medium (10-20%)	0%
Low (<10%)	0%



Climate-related Scenarios For Physical Risks

RCP4.5 and RCP8.5 2030 2040

Description:

Optimistic

The "Optimistic" scenario (SSP2 RCP4.5) represents a world with stable economic development and carbon emissions peaking and declining by 2040, with emissions constrained to stabilize at ~650 ppm CO₂ and temperatures to 1.1–2.6°C by 2100

Business as usual

The "Business as usual" scenario (SSP2 RCP8.5) represents a world with stable economic development and steadily rising global carbon emissions, with CO₂ concentrations reaching ~1370 ppm by 2100 and global mean temperatures increasing by 2.6–4.8°C relative to 1986–2005 levels.

Pessimistic

The "Pessimistic" scenario (SSP3 RCP8.5) represents a fragmented world with uneven economic development, higher population growth, lower GDP growth, and a lower rate of urbanization, all of which potentially affect water usage; and steadily rising global carbon emissions, with CO₂ concentrations reaching ~1370 ppm by 2100 and global mean temperatures increasing by 2.6–4.8°C

Scenario	2030					
	Optimistic		Business as usual		Pessimistic	
	Sites	%	Sites	%	Sites	%
Low	33	22%	33	22%	31	21%
Low-medium	11	7%	11	7%	12	8%
Medium-high	36	24%	32	21%	27	18%
High	34	23%	34	23%	34	23%
Extremely high	36	24%	40	27%	46	30%
TOTAL	150	100%	150	100%	150	100%

Scenario	2050					
	Optimistic		Business as usual		Pessimistic	
	Sites	%	Sites	%	Sites	%
Low	33	22%	32	21%	31	21%
Low-medium	10	7%	12	8%	12	8%
Medium-high	33	22%	27	18%	27	18%
High	30	20%	43	29%	34	23%
Extremely high	44	29%	36	24%	46	30%
TOTAL	150	100%	150	100%	150	100%



Water Dependency 2024

We use the ENCORE Tool to analyze the water dependencies on both groundwater and surface water, which are the main sources of water withdrawal. This year, we conducted more detailed analysis within the Manufacturing sector, particularly focusing on the division of chemical and chemical product manufacturing, and the group/class of other chemical product manufacturing. This approach helps in identifying water risks and opportunities for improving water efficiency, as well as planning and implementing strategies to achieve water security and sustainability.

Upstream activities:

The polymerization unit, which is our main process, has a low materiality rating, indicating minimal water usage and limited reliance on ecosystem services for production. However, it is essential to utilize water from the cooling tower to reduce the temperature of the reaction.

We implement water conservation strategies by reusing and recycling water, as well as storing it for utility purposes at our facilities. Nonetheless, maintaining high water quality is vital for the efficiency of cooling systems and must be diligently monitored, even when water availability is sufficient.

Downstream activities:

During the product use phase, our PET resins are molded into bottles at customer sites, and water is not involved in the process.

In our recycling activities, the process heavily relies on water and must be halted if there is a continuous supply issue or if the water quality is substandard.

- Water plays a crucial role in recycling, as flakes are washed twice with water.
- During recycled fiber production, water is also used to cool down the yarns.

To address the quality issue, a water treatment plant has been prepared at the sites to purify water for units dependent on it.

The screenshot displays the ENCORE Tool interface, divided into two main sections: 'Ecosystem services' and 'Assets'.

Ecosystem services: This section is titled 'Provisioning services (1)' and features a 'Water supply' entry. It includes a 'Provided by' dropdown menu with a water icon and a 'Water' label. Below this, there is a descriptive paragraph: 'Water supply services reflect the combined ecosystem contributions of water flow regulation, water purification, and other ecosystem services to the supply of water of appropriate quality to users for various uses including household consumption. This is a final ecosystem service.' To the right of this text are two buttons: 'FACTSHEET >' and 'EXPLORE MAP >'. Below the description is a section titled 'ISIC Groups/Classes' with an entry for 'Manufacture of plastics and synthetic rubber in primary forms' marked with a 'M' icon. The text next to it reads: 'Medium materiality rating Manufacturing depends on water supply services provided by ecosystems to ensure sufficient quantity and quality of water for cooling and cracking chemicals.'

Assets: This section is titled 'Direct Physical Input (2)' and lists two types of water: 'Ground water' and 'Surface water'. Each entry has a 'Provided by' dropdown menu with a water icon.

Production processes: This section features an entry for 'Polymerization' marked with a 'L' icon. The text next to it reads: 'Low materiality rating Most of the time the production process can take place even with full disruption of the ecosystem service'.

In summary, our analysis indicates that water dependency in our operations, including upstream and downstream activities, has a low materiality rating.

Water supply is rated as having medium materiality because its sources of water supply may create conflicts with communities, impact quality, and potentially require additional water purification units to prevent issues in production and utility.

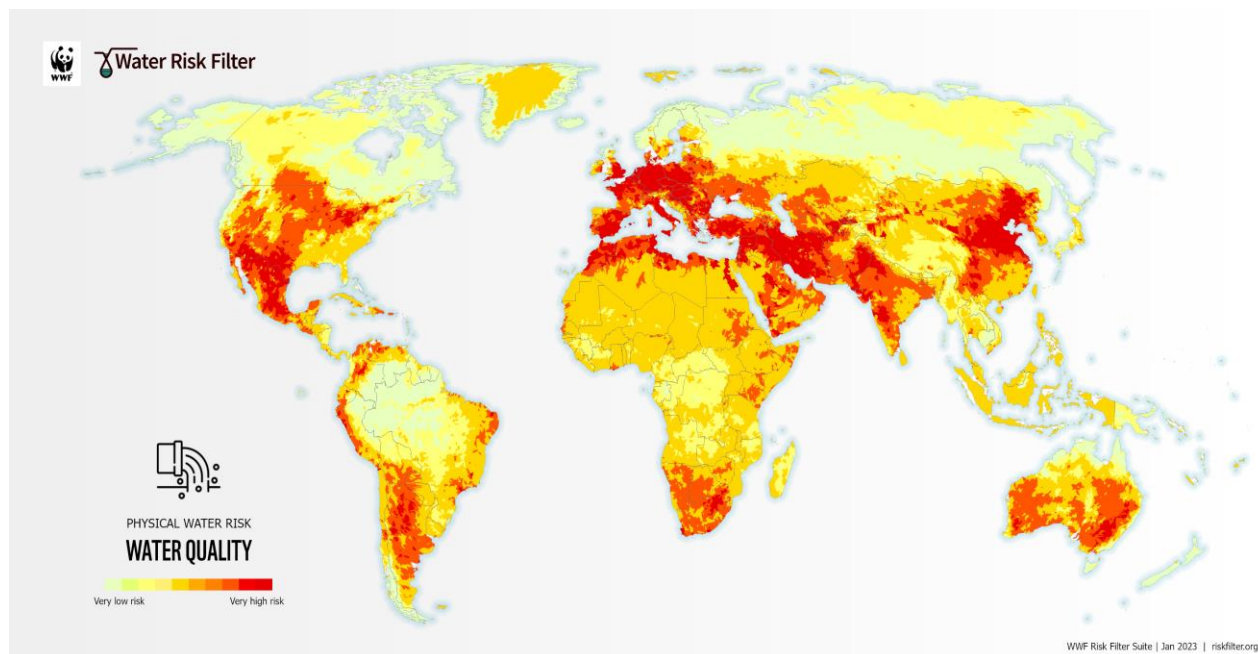
We continuously monitor our water systems and have implemented solutions for reusing, recycling, and storing water, including a water treatment plant. Furthermore, we strive to improve our water efficiency and productivity by optimizing water usage and minimizing impact to stakeholders, while increasing the value added per unit of water consumed or withdrawn.



Water Quality

Water Quality Risk Current trend Scenario 2030

We use the [WWF Water Risk Filter](#) to assess the physical water risk - water quality risk in the future [in the year 2020 (baseline)]. This is how water quality risk will look like in a world similar to current socio-economic development trends (SSP2) and intermediate GHG emission levels (RCP4.5 /RCP6.0), a pathway which will lead to an increase of global mean surface temperature of approximately 2°C by the end of the 21st century.



Water Quality Risk in 2030 (Focused on 65 sites in extremely-high- and high-water stress areas)	
Extreme Risk	8 sites [Americas = 5 / EMEA = 2 / APAC = 1]
Very High Risk	18 sites [Americas = 2 / EMEA = 10 / APAC = 6]
High Risk	12 sites [Americas = 2 / EMEA = 0 / APAC = 10]
Medium Risk	26 sites [Americas = 5 / EMEA = 2 / APAC = 19]
Low Risk	1 sites [Americas = 0 / EMEA = 0 / APAC = 1]
Very Low Risk	0 sites [Americas = 0 / EMEA = 0 / APAC = 0]



Summary

No. of Sites in each water stress level	2024	Regions (2024)
Extremely High	0	-
High	3	APAC (3)
Medium High	69	
Medium	64	
Low to Medium	11	
Low	-	
Total	147*	

*3 sites' data is not available with WRI software

Impacts to Indorama Ventures in each water stress level	Production Compared to Indorama Ventures' total production
Extremely High	-
High	0.20 million tons (1.26%)

NOTE: Indorama Ventures' total production in 2024 including intracompany sales volume = 16.35 million tons

Potential risk from production loss = 0.20 million tons (1.26%)
Estimated 2024 EBITDA loss from plant shutdowns = at least \$ 4.60 million
(due to projected shutdown for 90 days at site with high and extremely high drought risks)





RIVERINE FLOODS

Summary

No. of Sites in each water stress level	2024	Regions (2024)
Extremely High	26	EMEA (4), The Americas (4), APAC(18)
High	22	EMEA (1), The Americas (6), APAC(15)
Medium High	16	
Medium	-	
Low to Medium	29	
Low	57	
Total	150	

Impacts to Indorama Ventures in each water stress level	Production Compared to Indorama Ventures' total production
Extremely High	2.96 million tons (18.14 %)
High	1.75 million tons (10.68%)

NOTE: Indorama Ventures' total production in 2024 including intracompany sales volume = 16.35 million tons

Potential risk from production loss = 4.71 million tons (28.82%)
Estimated 2024 EBITDA loss from plant shutdowns = at least \$ 106.61 million
(due to projected shutdown for 90 days at site with high and extremely high riverine floods risks)





COASTAL FLOODS

Summary

No. of Sites in each water stress level	2024	Regions (2024)
Extremely High	10	APAC (8) , EMEA (2)
High	15	EMEA (5), The Americas (3), APAC (7)
Medium High	14	
Medium	-	
Low to Medium	18	
Low	93	
Total	150	

Impacts to Indorama Ventures in each water stress level	Production Compared to Indorama Ventures' total production
Extremely High	1.21 million tons (7.42%)
High	2.83 million tons (17.29%)

NOTE: Indorama Ventures' total production in 2024 including intracompany sales volume = 16.35 million tons

Potential risk from production loss = 4.04 million tons (24.71%)
Estimated 2024 EBITDA loss from plant shutdowns = at least \$ 91.39 million
(due to projected shutdown for 90 days at site with high and extremely high coastal floods risks)





Summary

Impacts to Indorama Ventures

Sea level rise would affect to 6 operations on 4 countries.
This would lead to 1.19 million tons of production loss and at least \$ 111 million EBITDA loss from plant shutdowns (calculation based on 2024 EBITDA).

To date, we have not faced any impact on sea level rise.

We continue to monitor this risk and have business continuity plan in place to manage the risk and take actions effectively.



Water-related Business Risks



Physical Risks:

- **Water scarcity** : droughts, seasonal variability, floods, disasters, and water depletion at any sources can lead to interruptions in water supply, jeopardizing plant operations, reducing capacity utilization, or leading to unplanned shutdowns.
- **Water quality** : raw water containing impurities or substandard water can affect product quality and cause equipment corrosion and damage. The cost and complexity of treating low-quality water add challenges to operations.
- **Flooding and Extreme Weather Events** : these can physically damage facilities, increase the risk of accidental releases of hazardous substances into the environment, and lead to regulatory violations and environmental harm.

Regulatory Risks:

- **Water use and discharge** : evolving in response to environmental concerns and public pressure, bounding by issues like water scarcity, sectoral conflict, or a negative public image of the company regarding its business operations
- **Compliance and permits** : becoming more stringent and increasingly subject to review and modification by authorities, especially in water-stressed regions, and requiring the adoption of new technologies for water efficiency or pollution control, leading to cost and complexity

Failure to with laws and regulations can lead to forced curtailment or closure of facilities, threatening long-term viability.

Reputational Risks:

A business suffers reputational risks from its unethical and harmful activities, such as the water-related impacts on water sources, ecosystems and communities. Such risks diminish the loyalty of stakeholders, reduce the company's brand value, and can result in regulatory concerns over the company's legal and social license to operate.

Near-term Mitigation Measures

- Commitment to sustainable water management (including water withdrawal and discharge) by ensuring consistent enforcement and complying with all applicable environmental laws, international standards, and regulations in the countries where we have operations, and will be proactive in demonstrating our leadership and responsibility in line with our values.
- The risk management committees of plants and business segments regularly monitor potential regulatory changes and evaluate water risks and opportunities by conducting scenario analyses with those changes.
- We conduct a water sensitivity analysis using the AQUEDUCT Water Risk tool developed by the World Resources Institute to identify water stress locations. This tool helps us evaluate changes in water demand, water supply, risks from stakeholders and changes in regulations based on current and future conditions.
- Undertaking natural disaster risk assessments of our plants and sites to determine the risk level and risk mitigations and intervention required, by developing risk assessment standards in collaboration with Environmental, Health & Safety, and Group Insurance.
- Establishment the "minimum expectations" on assessment , preparedness, and response planning including emergency procedure for natural disasters such as hurricanes, winter freeze, and flooding
- We evaluate options and the potential to reduce water consumption, increase the recycling and reuse of wastewater, and collecting rainwater to achieve our goal of zero effluent discharge at as many sites as possible, and establish targets at the entity and group level.
- Investments in water-saving technologies—such as closed-loop cooling, advanced treatment systems, and water reuse—can mitigate physical and business risks while reducing regulatory and reputational exposure. Moreover, diversifying water sources is essential. By investing in alternative supplies like rainwater harvesting, greywater recycling, and partnerships with municipal water reuse programs.
- Engagement and collaboration with local stakeholders, industry peers, NGOs, and governments , transparent reporting, and participation in collective action and policy dialogues regarding water basin management initiatives further anticipate regulatory changes and strengthen social license and mitigate reputational risks.

Impact to Stakeholders

We conduct comprehensive water risk assessments, mapping both site-specific and supply-chain vulnerabilities and will continue to monitor our water-risks and take actions to reduce them to ensure that our business does not pose any significant water-risks to the local community, the ecosystem, or the water resources, as part of our commitment to environmental sustainability and social responsibility.

The Aqueduct Water Risk Atlas, a tool developed by the World Resources Institute, ENCORE and WWF Water Risk Filter have been used to **assess the water-risks for our business. The tools measure water-risks across 13 indicators, such as water stress, drought, flood, groundwater depletion, and water quality.**

Our water-risk assessment showed that our business does not have any water-risks that impact the local stakeholders. Our water-risk score for our locations was low, indicating that we have sufficient and reliable water supply, **and that we do not contribute to water scarcity or pollution. Our suppliers and customers also had low water-risk scores, meaning that they are not exposed to water-related hazards or conflicts.** We are confident that our business operations are water-resilient and water-responsible, and that we are not imposing any water-risks on the local community, the ecosystem, or the water resources. **Our products (chemicals, bottles, fibers) have no water concerns connected in the downstream activities or during use phase, such as contamination in water, and/or water and energy inefficiently consumed.**

Engagement with local stakeholders, transparent reporting, and participation in collective action initiatives further strengthen social license and mitigate reputational risks. **We collaborate with the Industrial Estate Authorities (IEA) such as IEA Rayong, Thailand to monitor the water situation and shortage, and assess the impacts of water on local stakeholders. In Brazil, we participate in the Aquapolo project. Aquapolo is a significant water reuse initiative in the Southern Hemisphere aimed at providing an industrial water solution** by treating and recycling domestic wastewater, ensuring both water security and quality without affecting natural water resources and avoiding conflicts with stakeholders.



Our Contributions to SDG#6 Clean Water and Sanitation

Indorama Ventures is committed to sustainable water management and ensuring the most efficient water consumption by analyzing global water risk at all our operating sites in addition to implementing the 3Rs (reduce, reuse, recycle).

We also collaborate with the authorities on issuing collective actions on water issues to improve the efficiency of water supply management and avoid potential conflicts with stakeholders.

Additionally, we provide safe drinking water and systems to communities and schools in rural areas.

2024 PERFORMANCE

Target : 6.3.1 Water Consumption and Conservation

6.44% reduction against 2025 target

Target : 6.3.2 Water Quality

Wastewater returned to sources at the acceptable quality and level of local laws and regulations

Target : 6.4.1 Water Use Efficiency

Water intensity = **4.94 m³/ton of production**

7.16% Water reused & recycled

Target : 6.4.2 Water Stress

Water stress assessment is conducted every year

24% of sites are in **extremely high-water** stress area

19% of sites are in **high water** stress area

Target : 6.5.1 Integrated Water Management

- **Indorama Ventures Longlaville replaced its open cooling system with a closed-loop setup, cutting water use by 20,105 m³ and saving € 12,500 annually**
- **6 sites have achieved Zero Liquid Discharge**

Target : 6.5.2 Transboundary Cooperation



Thank you

