

BACKGROUND  
PAPER

**WATER**

LAST UPDATED: APRIL 2023

**LANXESS**  
Energizing Chemistry

## MANAGEMENT SUMMARY

The availability of fresh water is essential for life and socio-economic development. As a chemicals company, we rely on water for cooling (80%), for process purposes (18%) and in the form of steam (2%). At LANXESS, we are committed to a responsible use of water, and the Board of Management is responsible for overseeing our water strategy, risk management and performance. Globally, we aim to decouple economic growth from water consumption and wastewater loads. We are committed to using water more efficiently and to increasing the share of alternative water sources. Since 2018, we have reduced our specific water consumption by around 41%.

- 🎯 **Global targets:** 2% y/y reduction of specific water consumption and specific TOC (total organic carbon) in wastewater

Local context plays an important role in sustainable water management. The local water stress situation is one of the most important aspects. More than 90% of our total water withdrawal takes place in low stress areas, and only around 2% in areas with high or extremely high water stress. In order to prioritize and to develop context-based goals and measures, we combine aspects like water stress and operational or regulatory risks for water risk assessments. In total, we have identified four water risk sites in India, Italy and China. At all these sites, we have started to implement water stewardship (programs) and are committed to further reducing our water withdrawal – for example, by installing a new and more efficient cooling tower and by increasing the internal recycling rate of water.

- 🎯 **Risk-based targets until 2023:**
  - Implementation of water stewardship programs at water risk sites
  - 15% absolute reduction of water withdrawal at water risk sites (base year 2019)

At LANXESS, we understand that our responsibility for water does not end at our factory gates. Instead, we aim for a holistic approach taking into account all relevant stakeholders along the value chain and especially local communities. We engage as a corporate citizen in the communities where we operate, and we participate in multi-stakeholder initiatives.

# CONTENT

## MANAGEMENT SUMMARY

<b>LANXESS WATER PROGRAM</b>	<b>1</b>
<b>1. GLOBAL WATER MANAGEMENT</b>	<b>2</b>
Regulatory Compliance and Transparent Reporting	2
Performance and Targets	2
Water Quantity	3
Water Quality	3
<b>2. LOCAL WATER STEWARDSHIP</b>	<b>4</b>
Water Risk Assessment	4
Management Approach for Water Risk Sites	5
Information on our Water Risk Sites <i>and local water stewardship programs</i>	5
<b>3. BEYOND THE GATES</b>	<b>7</b>
Social Engagement, Stakeholder and Community Activities	7
Our Water Impact along the Value Chain	7
<b>GLOSSARY</b>	<b>8</b>

# LANXESS WATER PROGRAM

Fresh water is essential for life and socio-economic development, but water scarcity and the increasing pollution of water sources are a growing concern. Billions of people do not have adequate access to water – a fact that has devastating effects on their health, dignity and prosperity. Access to water and sanitation is a basic human right. Sustainable water management and sanitation for all is anchored in UN Sustainable Development Goal (SDG) 6.

 More information on LANXESS and the SDGs

Water is not only important for human health and our ecosystems, but also for a thriving economy. Many industry sectors, like agriculture, power generation or manufacturing, depend on water of a certain quality and quantity.

At LANXESS, we are committed to a responsible use of water. That is why we initiated our global LANXESS Water Program in 2020, consisting of three elements:

As the first part of this program, we are committed to sustainable water management at all our production that is compliant with all relevant regulations. Our operating licenses regulate limits for withdrawal quantities, discharge temperatures and wastewater loads. Compliance with regulatory limits is our top priority. We have also set ourselves global efficiency targets to drive improvements. We report transparently on different water indicators and developments of the last years (see 1. “Global water management”). Building on our global water management, we develop concepts for water stewardship. We developed a risk-based approach for this purpose and to address local water challenges and take actions on a river basin level to ensure that we live up to our responsibility for the local system. The focus lies on our risk locations, which we analyze on a regular basis (see 2. “Local water stewardship”). Thirdly, we are engaged beyond our gates. As a company, we support local communities with specific, water-related challenges. We further develop our understanding of our water-related impacts along the value chain and our management of these impacts (see 3. “Beyond the gates”).

## LANXESS Water Program



1

### Global water management:

Regulatory compliance, transparent reporting, performance and targets

2

### Local water stewardship:

Risk assessment and management approach

3

### Beyond the gates:

Social engagement and impact valuation

## 1. GLOBAL WATER MANAGEMENT

With regard to water management, we follow a Group-wide approach. Our CEO heading our Sustainability Committee is responsible for overseeing the water management strategy and performance. Within the Committee, decisions are taken with regards to water targets, projects and stewardship measures. As part of the risk management process managed by the Corporate Risk Committee, we report water-related risks and opportunities. Details on our risk reporting can be found in the CDP Water Security.

 More information on our committees and functions

 CDP Water Security

In the 2022 CDP assessment, we improved our rating for water safety to an A-. The analysts were particularly impressed by our targets, risk analysis and policies. Other ratings and indices also confirm this high level. Nevertheless, we will of course continue to strive for further improvements in the future.

### Regulatory Compliance and Transparent Reporting

All of our production sites have management systems in place to ensure that our water use is within the permissible limits defined in our operating permit. We monitor the withdrawal, consumption and discharge of water as well as the wastewater loads at all our production sites. We report this data annually. In this context, the data is verified by an external party. An extensive list of our water KPIs can be found in the ESG Data Factsheet.

 ESG Data Factsheet

We currently see increasing transparency requirements in both regulatory and voluntary reporting. Due to our water program and the progress made in water stewardship, we

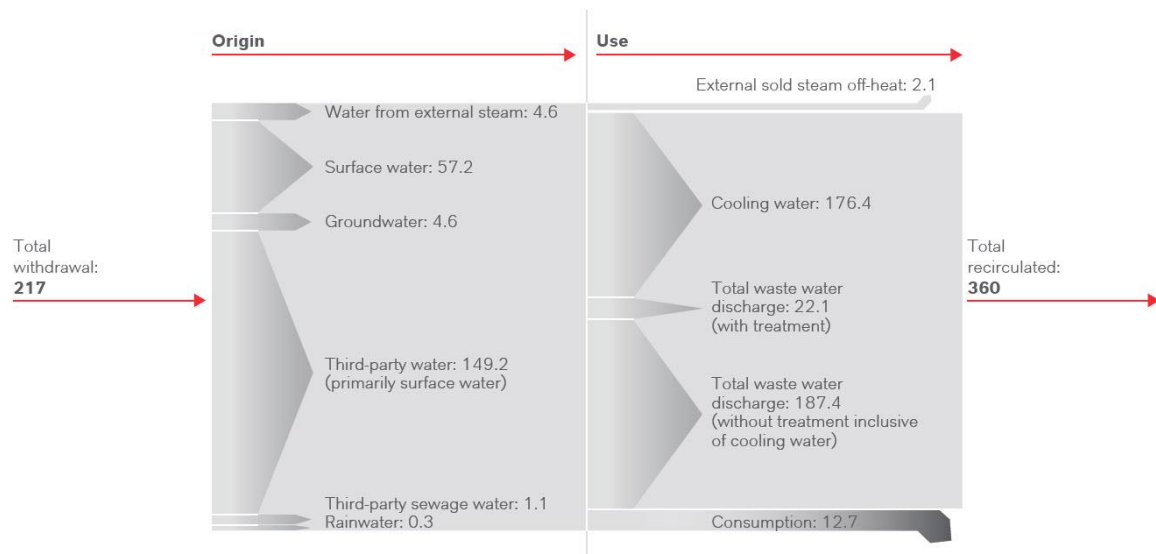
see ourselves on the right track to meet the increasing requirements.

As part of our commitment to safeguarding resources, we use state-of-the-art wastewater treatment facilities. At our large “Verbund” sites along the Lower Rhine, Currenta is our professional partner for wastewater management. At some other sites, we run our own wastewater treatment facilities. In Antwerp, we not only treat our own wastewater, but also that of our “Verbundpark” partner. At other smaller sites, we opt for local wastewater treatment.

### Performance and Targets

We use water mainly for cooling (80%). Also, we use water for process purposes in production facilities (18%) or in the form of steam (2%). Because cooling water does neither come into contact with raw materials nor products, the majority of our withdrawn water does not need any treatment and can re-enter the water cycle directly. The discharged water from processes is treated as required and returned to the natural cycle as well. As illustrated below, we consume less than 7% of the water we withdraw. In addition to evaporation as the largest part of water consumption, water that leaves LANXESS borders via waste disposal or as a component of our products is also counted as consumption.

**Water Balance**  
in m<sup>3</sup>



Rounded figures  
Indicative ratios

Data from 2021



### Water Quantity

We aim to decouple our economic growth from water withdrawal and consumption. To achieve our global reduction target, we are committed to continuously improving our overall water efficiency. In addition, we calculate the impact of investment projects (CAPEX) on our water KPIs to ensure that our investments do not alter our efforts towards a more sustainable use of water. In order to further protect groundwater sources, we aim to continuously increase the share of rainwater or sewage in the total water withdrawal, especially at our water risk sites (see "Information on our water risk sites"). At other plants such as Porto Feliz (Brazil) we use cleaned surface water. Since 2018, we have been able to reduce our specific water consumption by 41%. In 2022, we were able to further reduce our specific water consumption, mainly due to the deconsolidation of HPM. We aim to continue this trend.

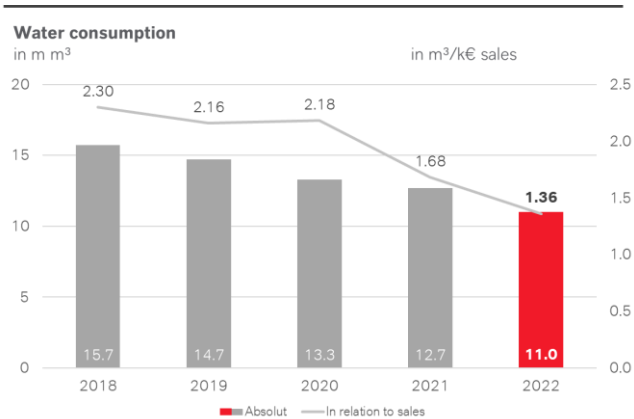
### Water Quality

The pollution of water bodies is a growing concern. Water pollution takes place when toxic substances enter water bodies and therefore degrade the quality of the water. This is not only problematic for aquatic ecosystems, but also for humans who rely on surface water as a fresh water source. Furthermore, pollutants in the surface water can seep through and also contaminate the groundwater.

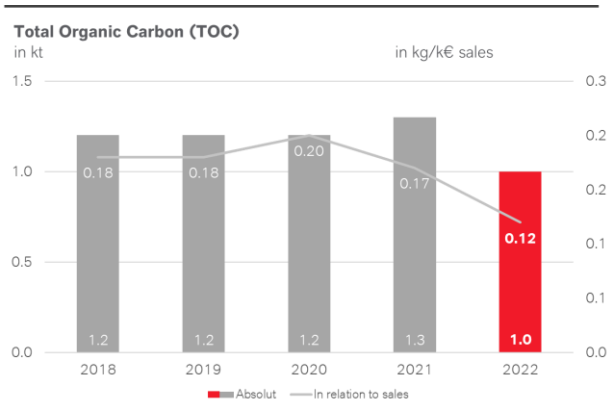
We monitor the wastewater loads at all our sites as well as the loads of discharged water. In addition to the TOC (resp. COD) amount, we also measure, and report on, nitrogen, phosphorus and heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Sn, Zn, AOX, POP's) and comply with all water-related permit limits and regulations. Since 2018, we were able to reduce our specific TOC values by 33%. We are committed to continuously reducing all our wastewater load.



**Continuous target:** 2% y/y reduction of specific water consumption



**Continuous target:** 2% y/y reduction of specific TOC in wastewater



#### Best practice: Modernization of wastewater treatment plant in Kallo (Belgium)

LANXESS commissioned a new wastewater treatment plant at its Belgian site in Kallo (Antwerp) in 2022. We invested around twelve million euros in the facility, which has a treatment capacity of around 260,000 liters of wastewater per hour. The particular challenge was that the plant had to remain in operation during the renovation.

Besides reducing the TOC levels, we also monitor other discharges (like rainwater) to surrounding fresh water resources. If the quality of these discharges does not meet the standards that we have set for ourselves, we take steps for improvement, as for example in El Dorado, Arkansas (USA).



#### Best practice: Constructed wetlands project at the south plant in El Dorado (USA)

When we acquire companies, we take over responsibility for all their assets. With regard to industrial sites, this also includes taking responsibility for prior contamination. The south plant in El Dorado (USA) which we acquired in 2017, is a case in point. Over the past decades, historic site uses have resulted in the accumulation of heavy metals in shallow soil surfaces. During rain events, these metals could eventually mix with storm water runoff and be discharged offsite. To reduce this risk, we implemented a constructed wetlands project. The constructed wetlands are a passive treatment technology that utilizes vertical flow filtration and biological processes (anaerobic metal-sulfide reactions) in individual treatment cells to recover heavy metals prior to discharge. Sulfate-reducing bacteria in the media produce sulfide that causes heavy metals to precipitate as insoluble metal-sulfide complexes. For this project, we received the Diamond Award for Excellence in Environmental Leadership from the Arkansas Environmental Federation as well as the Sustainability Award in Waste Minimization from the American Chemistry Council.

## 2. LOCAL WATER STEWARDSHIP

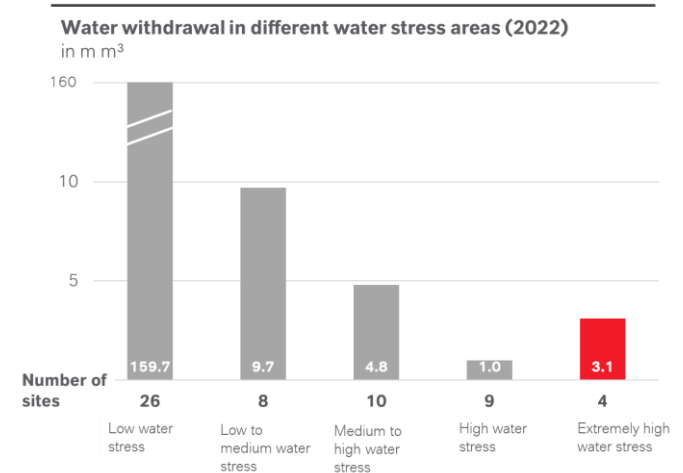
Local context plays an important role in sustainable water management. We operate in 18 countries. As can be seen below our main water withdrawal takes place at the Lower Rhine sites in Germany and in the rest of Europe.

The most important factor in this context is the “water stress level” of a region. Water stress is calculated as the ratio of the total annual water withdrawals to the total available renewable water supply in that year. A high water stress score indicates that much of the available and accessible fresh water is needed to meet human and ecological demands.

As a consequence, a high water stress score requires an even more responsible use of water. For our assessment we used the WWF water risk filter. In total, 14 of our 60 sites are located in water stress areas. Our water withdrawal at these 14 sites accounts for only around 2% of our total water withdrawal. More than 91% of our water withdrawal takes place in low stress areas.

### Water Risk Assessment

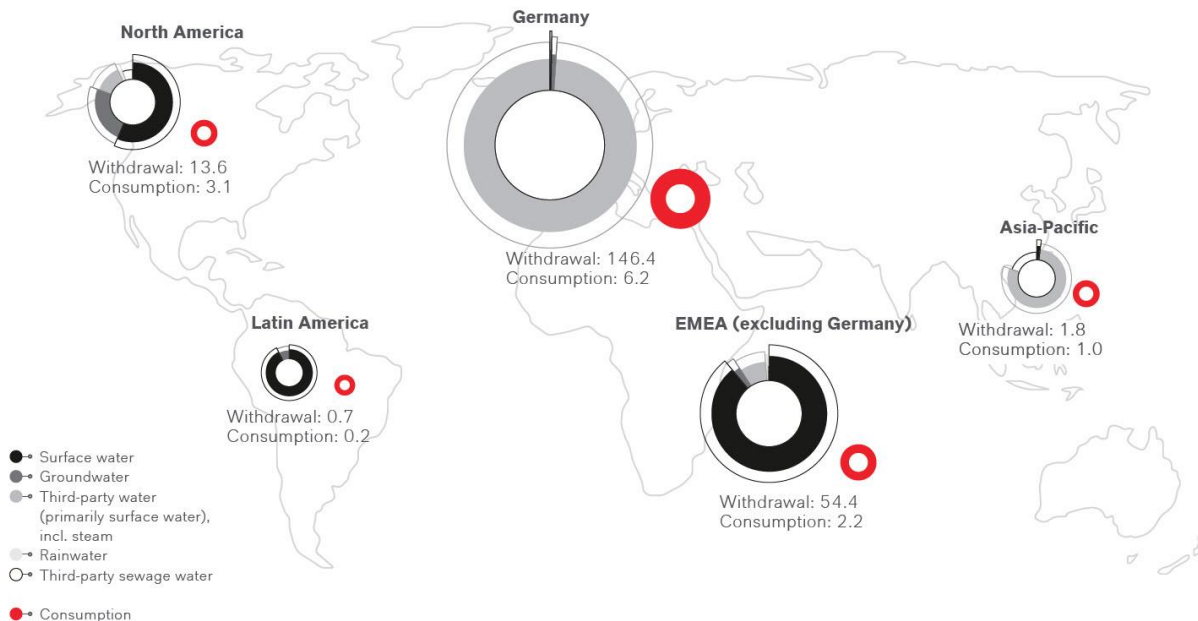
While water stress is the most important water indicator in the current debate, it is not sufficient for a comprehensive assessment of water-related risks at our production sites. That is why LANXESS has developed a comprehensive water risk analysis. The assessment combines internal data of water withdrawal, wastewater loads, water stress with operational or regulatory risks.



The water risk assessment helps to prioritize our sites based on the magnitude of water risk, and it lays the foundation for context-based goals and measures for the site. Our main indicators for water risk are the water stress score and the specific water withdrawal per ton of product. The water stress score is the average of the current and future water stress, and therefore reflects the current situation as well as the expected future change (in a pessimistic scenario with higher population growth and a lower rate of urbanization). The second indicator is the specific water withdrawal per ton of product. The less water a site withdraws for production, the lower the risk posed by water scarcity. We analyse all our sites using this assessment once in every two years. The latest assessment was carried out in 2023 based on the 2022 data. As a result of this assessment we identified the same four water risk sites as in earlier assessments, namely Jhagadia (India), Latina (Italy), Nagda (India) and Qingdao (China).

### Water Withdrawal and Consumption by Region

in m³



Indicative ratios

Data from 2021

### Management Approach for Water Risk Sites

The LANXESS water risk sites identified in our analysis are in focus of our water efforts. We decided to implement site-specific water stewardship programs at the water risk sites until the end of 2023. They include action plans, collaborative and multi-stakeholder water projects to address shared basin risks and best water practices on site. To facilitate this program, we developed a LANXESS specific water stewardship framework that is based on accepted and recognized standards, namely Alliance for Water Stewardship (AWS), European Water Stewardship (EWS) standards. This framework consists of three main steps namely data collection, water stewardship questionnaire and an action plan to help the employees on our water risk sites with having a systematic understanding of their local water situation and the impact of their activities on it. Our water risk sites were chosen as pilot sites for testing this framework. An internal and external water expert interview was conducted to review the completeness of the framework. Based on all the learnings and gaps identified from the pilot testing and expert interview the final version of the LANXESS specific water stewardship framework was developed. It addresses the special water needs of our sites at local level and guides them in developing a site-specific action plan based on a detailed gap analysis at site and catchment level. To step-up as a local water steward, our risk sites have developed a site-specific action-plan for engagement using this framework and will implement the planned actions accordingly. As a cornerstone of these local water stewardship programs, we are committed to reducing water withdrawal at these four sites.



**Target:** Implementation of water stewardship programs at water risk sites until 2023



**Target:** 15% absolute reduction of water withdrawal at water risk sites until 2023 (base year 2019)

### Information on our Water Risk Sites and local water stewardship programs

#### India (Nadga & Jhagadia)

Two water risk sites, Nagda and Jhagadia, are located in India. Nagda is located in the Chambal River Basin in the Madhya Pradesh province and Jhagadia in the Narmada River Basin in the Gujarat province. In both river basins, the current water stress is extremely high. In a ten-year pessimistic future scenario, the water supply and demand situation in the basins will remain at a critical level. Although neither of the two sites experienced production disruptions due to inadequate water supply in the past decade, we are continuously working to improve our water management. Furthermore, the government connected the Narmada and Kshipra rivers so that the water flow in both rivers was increased. In the next step, the Kshipra will be connected to the Chambal to further improve the water supply.

In Nadga, the Flavors and Fragrances business unit (BU) produces benzyl and related flavors and fragrance products. At this site, we have invested heavily in sustainability projects and continue to do so. A sewage treatment plant and a wastewater post-treatment plant are in place. Therefore, more than half of the water withdrawal comes from community sewage water. Nagda is a zero liquid discharge site: no water is discharged outside the site. All available water is recycled and recovered for reuse within the site, which leads to huge water savings. For our engagement in Nagda, we have won several awards and. In 2021, the site was awarded the title of “The best Water Management Company of the year” by Confederation of Indian Industry. In 2021, a large water-consuming company followed our lead and adapted our water-saving approaches.



More information on sustainability initiatives in Nagda, India

Multiple business units have operations at our site in Jhagadia (India). Among the many useful products that originate from Jhagadia are the Lewatit® ion exchange resins for water treatment and the Preventol® active ingredients for preservation, disinfection and wood protection. To further reduce the water withdrawal projects like recycling certain wastewater streams through reverse osmosis are planned along with installing multiple flow-meters on site for a more accurate water accounting. Recently, a pilot plant for the reverse osmosis project was successfully commissioned. After a pilot phase it is planned to implement it on a large scale. Jhagadia is also involved locally and was able to implement 2022 rainwater harvesting projects at three schools in the area.



**Latina (Italy)**

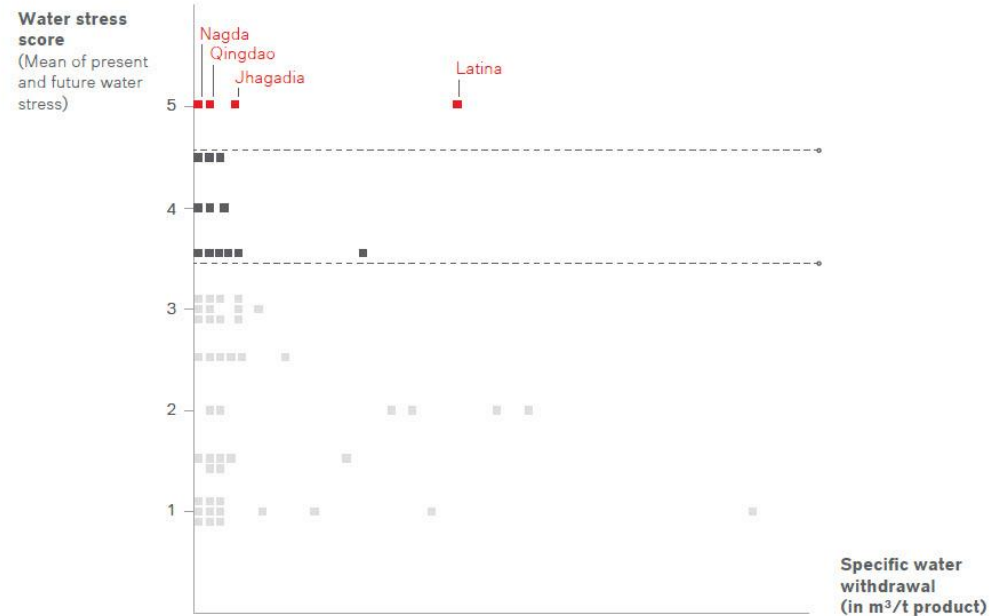
Latina is located in the Lazio province (Italy), in the Rio Martino River Basin. The river basin already has an extremely high water stress, and the water supply is expected to decrease further in a ten-year pessimistic scenario. Two business units, Urethane Systems and Lubricant Additives Business, operate in Latina. The site has a relatively high water withdrawal. About half of this water is used for washing, while the other half is used as cooling water and never comes in contact with any product. High volumes of cooling water are required to achieve high flow rates so that the water temperature increase is kept to a minimum before discharge. In order to be more efficient new cooling-towers were installed and a switch over to existing cooling towers was made wherever possible. This already resulted in huge water savings and a reduction in water withdrawal amounts. Multiple flow-meters were installed for more accurate water accounting and an on-site rain water harvesting project were explored. In 2022, Latina colleagues engaged in a local "river clean-up" campaign.

**Qingdao (China)**

Qingdao has by far the lowest water withdrawal of the water risk sites. It is located in the Dagu River Basin in the Shandong province (China), a region with extremely high water stress. In a ten-year pessimistic scenario, the water supply will increase slightly, but the water demand will increase even more. Rhein Chemie produces additives and high-performance bladders for tire production at this site. The only water source is municipal water. The very small water withdrawal is entirely used as process water and for sanitary purposes. After treatment, most of the process water is returned to the water cycle.

Despite the already very low water use in Qingdao, further savings have been realized over the past 3 years through a variety of smaller improvement measures.

**Result of Water Risk Assessment**



■ Water risk sites  
 ■ Sites in areas with moderate water stress score  
 ■ Sites in areas with low water stress score

Data from 2021

### 3. BEYOND THE GATES

At LANXESS, we understand that our responsibility for water does not end at our factory gates. Instead, we want to take a holistic approach that takes into account all relevant stakeholders – especially the communities located close to our production sites. At present, the general discussion on water footprints along value chains has not yet led to a generally accepted methodology. However, we are constantly broadening our understanding of this issue and are committed to implementing further steps in this direction.

#### Social Engagement, Stakeholder and Community Activities

Both on a corporate level and locally, we conduct an active stakeholder dialogue that addresses, among other topics, water availability. On top of that, in 2018 we invited representatives from the fields of politics, science, environmental organizations and industry to a round table discussion on “water stress”.

 More information on our stakeholder dialogue

 More information on our round table on water

Water is one of the four focus topics for our corporate citizenship activities, together with education, climate protection and culture. Through local projects, we help to safeguard the supply of clean drinking water. Additionally, we are encouraging young people to adopt a more responsible approach in order to use this valuable resource efficiently.

 More information on our corporate citizenship activities

We participate in relevant multi-stakeholder and industry initiatives, for example:

- › The German Water Partnership, a network to develop new solutions for water management issues

- › The “Low Water Action Plan” for the Rhine River, which focuses on our three main German production sites (Leverkusen, Dormagen, Krefeld-Uerdingen)
- › Rainwater projects in villages close to the Indian sites (Nagda and Jhagadia)

 More information on the German Water Partnership


 More information on the Low Water Action Plan (DE)

#### Our Water Impact along the Value Chain

To create value for society, we need to understand the impact of our actions along the entire value chain, both positive and negative, and manage it actively and consciously. This also applies for water.

Through our water stewardship program, we systematically work on better understanding our water impact along the entire value chain, the volume of water we use throughout the value chain, as well as the context in which the water is being used. An integrated water impact scheme considers the availability, quality and regulation of water and addresses social issues across our value chain. Broadening our scope and managing water holistically in the long term will not only address societal concerns, but will also enable us to manage risks and opportunities more effectively going forward.

We cooperate with our supply chain partners to evaluate and audit their water performance and share learnings and best practices. In the context of the industry initiative “Together for Sustainability” (TfS), we collaborate with other chemical companies to enhance the environmental, social and governance performance of chemical supply chains. The TfS program is based on the UN Global Compact and Responsible Care® principles.

 More information on the “Together for Sustainability” initiative

We also calculate the impact of our core business activities on society. Water is an important part of this impact valuation.

 More information on our impact valuation

# GLOSSARY

**Alliance for Water Stewardship (AWS):**

AWS is a global membership collaboration comprising businesses, NGOs and the public sector. The members contribute to the sustainability of local water-resources through their adoption and promotion of a universal framework for the sustainable use of water – the International Water Stewardship Standard, or AWS Standard – that drives, recognizes and rewards good water stewardship performance.

**Carbon Disclosure Project (CDP):** An independent, non-profit organization whose mission is to help companies all over the world to transparently disclose information concerning their greenhouse gas emissions and utilization of water resources and forests. By 2020, data had been received from more than 9,600 companies, making the CDP data platform one of the world’s most detailed sources of environmentally relevant information.

**Chemical oxygen demand (COD):** An indicative measure of the amount of oxygen required for fully oxidizing organic matter. The amount is calculated indirectly, whereby a chemical oxidant is added to a sample and its consumption measured. To yield the COD value, the TOC value is multiplied by three.

**Cooling water:** Water used for cooling containers in which chemical reactions take place. It does not come into contact with products or raw materials.

**External sold steam off-heat:** Heat generated during operation is transported in the form of steam and can be sold externally as an energy source.

**European Water Stewardship (EWS):**

The EWS standard addresses the implementation of Water Stewardship at site level, with a strong focus on understanding and engaging in the local river basin, as water users share risks and opportunities related to good or poor water resource management. It is also valuable for companies wishing to promote responsible Water Stewardship practices within their investments. The use of the EWS standard is embedded in a structural system verified by recognized certification bodies and accredited auditors.

**Groundwater<sup>1</sup>:** Water that is being held in, and that can be recovered from, an underground formation.

**Rainwater:** Collected or accumulated water for operational use. Rainwater is also classified as surface water in accordance with the GRI, though it has its own separate entry here.

**Recirculated water<sup>1</sup>:** Sum of effluents, used water, and unused water released to surface water, groundwater, seawater, or a third party, for which the organization has no further use, over the course of the reporting period.

**Specific withdrawal / ton of product:** The volume of water withdrawn in order to produce one ton of product.

**Surface water<sup>1</sup>:** Water that occurs naturally on the Earth’s surface in ice sheets, ice caps, glaciers, icebergs, bogs, ponds, lakes, rivers, and streams.

**Third-party sewage water:** Treated or untreated wastewater from third parties for operational use.

**Third-party water<sup>1</sup>:** Municipal water suppliers and municipal wastewater treatment plants, public or private utilities, and other organizations involved in the provision, transport, treatment, disposal, or use of water and effluent.

**Total organic carbon (TOC):** An indicative measure of the total organic carbon content in a sample. Thermal or wet-chemical oxidation is induced, and the resulting CO<sub>2</sub> is then measured.

**Wastewater discharge<sup>1</sup>:** Treated or untreated wastewater that is discharged.

**Water consumption<sup>1</sup>:** Sum of all water that has been withdrawn and incorporated into products [...] or generated as waste, has evaporated, transpired, or been consumed by humans [...], or is polluted to the point of being unusable by other users, and is therefore not released back to surface water, groundwater, seawater, or a third party over the course of the reporting period.

**Water from external steam:** Externally produced steam used primarily for energy supply purposes. Steam condensate is considered to be a source of water.

**Water risk<sup>2</sup>:** Refers to the risk of an enterprise experiencing challenges such as water scarcity, flooding, infrastructure decay or drought.

**Water risk site:** A location experiencing very high water stress currently or at risk of very high water stress in the future.

**Water scarcity<sup>2</sup>:** Describes the human-driven lack of freshwater resources and is expressed as a function of the volume of water consumption by humans relative to the volume of water resources in a given area.

**Water stewardship<sup>2</sup>:** Defined as the use of water that is socially and culturally equitable, environmentally sustainable and economically beneficial, achieved through a stakeholder-inclusive process that includes both site- and catchment-based actions.

**(Current) water stress<sup>3</sup>:** Refers to the ability – or lack thereof – to meet the human and ecological demand for freshwater. In addition to freshwater availability, it also takes into account the quality and accessibility of water. The WWF has developed a water risk filter containing five different water stress categories.

S	Water Stress Categories	Ratio of Withdrawals to Supply
1	Low stress	<10 %
2	Low to medium stress	10–20 %
3	Medium to high stress	20–40 %
4	High stress	40–80 %
5	Extremely high stress	>80 %

**(Future) water stress<sup>4</sup>:** A distinction is made between current and future water stress. To determine future water stress, we have used the pessimistic, ten-year scenario (based on the Aqueduct Water Risk Atlas). It assumes as standard a high rate of population growth and a low rate of urbanization.

**Water stress score:** The average value of current and future water stress.

**Water withdrawal<sup>1</sup>:** Sum of all water drawn from surface water, groundwater, seawater, or a third party for any use over the course of the reporting period

<sup>1</sup> Source: GRI 303: Water and effluents (2018)

<sup>2</sup> Source: Alliance for Water Stewardship (AWS), International Water Stewardship Standard v2.0, March 2019

<sup>3</sup> Sources: UNGC, CEO Water Mandate and WWF, Water Risk Filter

<sup>4</sup> Source: World Resource Institute, Aqueduct projected water stress country ratings

**PUBLISHER**  
**LANXESS AG**

50569 Cologne, Germany  
[www.lanxess.com](http://www.lanxess.com)

**LANXESS**  
Energizing Chemistry