Energy inputs 302-1, 302-3, 302-4, 302-5 T08

in petajoules	2020	2022	2023
Total fuels	54.59	50.49	48.03
Natural gas	*30.42*	*33.12*	*33.21*
Coal	*15.97*	*11.22*	*9.86*
Substitute fuels	*8.11*	*6.06*	*4.89*
Oil	*0.09*	*0.08*	*0.06*
Purchased electricity	9.17	10.70	10.94
Electricity sold	1.59	0.83	2.41
Purchased steam	12.84	13.78	12.85
Steam sold	10.10	9.51	9.64
Gross energy input[a]	76.59	74.96	71.82
Net energy input[b]	64.90	64.63	59.77
Change in net energy input versus 2020 in %	**0**	**0**	**–8**
Production in million metric tons	8.93	8.38	7.50
Specific net energy input in petajoules per million metric tons production	7.27	7.71	7.97
Change in specific net energy input versus 2020 in %	**0**	**6**	**10**

[a] Fuel inputs plus purchased electricity and steam.
[b] Fuel inputs plus purchased electricity and steam less electricity and steam supplied to third parties.

Water management

Strategy and management

We save water wherever possible and endeavor to achieve a further reduction in our emissions. In the reporting period, Evonik adopted a water policy and published it on its website. More. Our aim is to reduce specific freshwater intake by 3 percent relative to production volume between 2021 and 2030. This is to be achieved by a wide range of measures at our production sites. These measures were identified as part of the EAGER project p. 49. Integrated heat management measures can reduce the demand for cooling water, which in turn reduces the demand for freshwater. For example, our Active Oxygens business line has planned power-to-heat (PtH) projects for the period up to 2030. These include, for example, installing heat pumps in Europe, which should avoid around 35,000 metric tons of CO_2 and save more than 3 million m^3 of water a year. Process improvements help reduce freshwater intake. For instance, the Animal Nutrition business line has reduced water consumption by about 40 percent per metric ton of methionine at its facility in Mobile (Alabama, USA) by improving resource management at the site. In Antwerp (Belgium), Evonik is planning to use treated municipal wastewater instead of drinking water for its cooling towers in the future. Furthermore, there are plans to use the treated wastewater for steam generation, chemical processes, and in the desalination plants at this site. Based on full capacity utilization, this should allow savings of around 2.5 million m^3 of drinking water a year at this site from 2026 and reduce freshwater requirements by a further 10 percent. In view of this, the municipal water utility in Antwerp is planning to build a cooling water factory with several technology companies in the next three years to recycle and treat municipal wastewater.

We are also continuing our work on established water management topics, including monitoring our sites in water stress areas. Adequate availability of water for cooling and production processes plays a key role in our production activities. We therefore regularly analyze the short-, medium-, and long-term water risks at our sites. In the reporting period, we therefore widened our analysis of water stress at our sites to encompass a holistic assessment of water risks. We use the WWF[1] Water Risk Filter to analyze various physical risk aspects such as water stress, flooding, and water quality. In addition, we evaluate reputational risks, such as water conflicts and media scrutiny, and regulatory risks. Another focus is on the 2030 and 2050 time horizons, based on the TNFD[2] climate scenarios. The AWARE[3] method,

[1] World Wide Fund For Nature.
[2] TNFD = Task Force on Nature-related Financial Disclosures.
[3] AWARE = Available WAter REmaining.

Anaerobic processes for the treatment of process effluent and sludge with a high organic content use very little energy compared with incineration or aerobic biological treatment and generate virtually no residues for landfill. These methods also produce valuable biogas and reduce CO_2. We have developed a variety of concepts to implement this.«

Matthias Woyciechowski | Senior Expert Environmental Technologies, Germany

Water management

which we previously used to identify sites in water stress areas, has been integrated into the WWF Water Risk Filter. The water risk assessment looks at risks relative to the water basin and the type of water use at each site. Examples are particularly water-intensive processes. In the reporting period, we performed a full water basin assessment. We also started to assess water use by interviewing experts at our sites. We started with those sites that our water basin analysis identified as being in high-risk regions.

We use the WWW Water Risk Filter to determine the sites that are most affected by water risks. In the reporting period, we did not obtain a rating of very high or extreme for any of our 104 production sites. At five sites, water risk was classified as high. A further 47 sites are classified as medium risk in respect of the water basin. Ten of these are in the upper range (medium-high). The shift compared with the previous year (AWARE method) is attributable to the considerably wider scope of the WWF Water Risk Filter, which has a total of 12 risk categories. Risk category 1 (water scarcity) looks at six indicators, one of which is the AWARE approach. In addition, the WWF Water Risk Filter defines levels (extreme, very high, high, medium, etc.) to which the sites are allocated.

We also examined future risks for the 2030 and 2050 time horizons using the WWF Water Risk Filter, including analyses for the pessimistic, current trend, and optimistic scenarios. The pessimistic scenario is based on very conservative assumptions. On this basis, 19 sites would be classified as high risk in 2030 (but none as very high or extreme). In 2050, 23 sites would be classified as high risk and a further three as very high risk (but none as extreme risk). Analyzing our sites using the WWF Water Risk Filter helps us identify relevant water-related impacts, dependencies, and risks in order to derive and prioritize future measures. Furthermore, we are currently working on an approach to assign a monetary value to water risks.

In addition to the water risks outlined above, we perform a holistic risk analysis covering the additional potential impact of natural catastrophes such as storms, hail, floods, hurricanes, tornadoes, and torrential rainfall. Moreover, our sites are regularly audited by insurance companies. 303-1, 303-2, 303-3, 303-4, 303-5

Water data

Total water intake was 403 million m^3 in the reporting period, while discharges amounted to 397 million m^3. The difference of 6 million m^3 between water intake and discharge mainly comprises water used to replace evaporation losses. Around 98 percent of our total water intake of 1,724 million m^3 was for cooling purposes in energy generation and production. Only 2 percent (41 million m^3) was used for production purposes. We include

Water intake by source[a] 303-1 — T09

in million m^3	2021	2022	2023
Drinking water[b]	20.7	20.6	19.0
Groundwater	56.6	51.7	46.7
Surface water	174.3	172.1	153.8
Recycling of water from third parties and use of rainwater	4.3	3.4	4.7
Total freshwater	**255.9**	**247.8**	**224.3**
Salt water (sea water)	206.0	196.6	179.0
Total	**461.9**	**444.4**	**403.2**
Production in million metric tons	**9.5**	**8.4**	**7.5**
Specific water intake intake in m^3 freshwater per metric ton production	**26.8**	**29.5**	**29.9**
Development of specific freshwater intake relative to the reference base 2021 in %	**0**	**10**	**12**

[a] Differences between the data and totals are due to rounding.
[b] Water from municipal or other utilities.

water used in closed cooling circuits and evaporation losses when calculating the proportion of total water used for cooling.

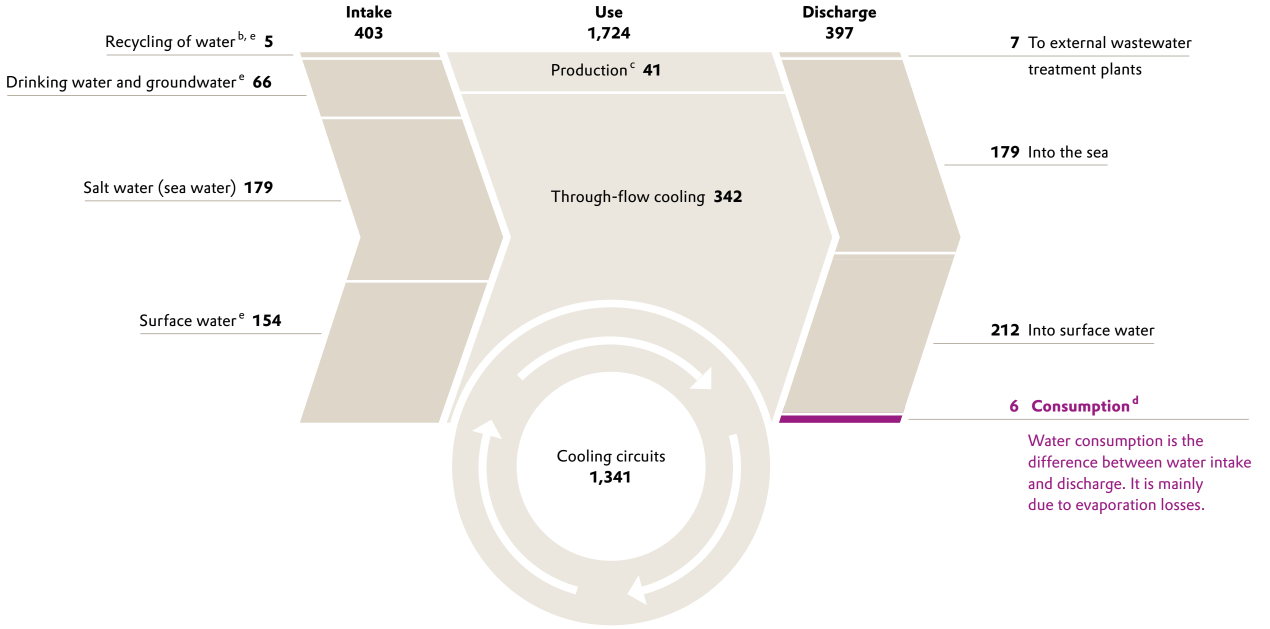
Evonik's consumption of freshwater—the total of recycled water from third parties, rainwater, drinking water, groundwater and surface water—declined by 10 percent to 224 million m^3 in the reporting period. The reduction in consumption of drinking water and surface water was mainly attributable to the reduction in production in 2023. The reduction in groundwater consumption was mainly due to the sale of the Lülsdorf site in Germany. The increase in recycling of water from third parties and use of rainwater was mainly due to increased rainfall in Marl (Germany) compared with the drought in 2022. The reduction in salt water intake in 2023 was due to a maintenance shutdown at a methionine plant on Jurong Island (Singapore) in the fourth quarter.

Emissions into water

Our sites aim to make a contribution to protecting natural water resources. When planning new production plants, we therefore consider the use of processes that generate little or no wastewater. Where contaminated water from production processes (production effluent) is unavoidable, partial streams are tested, for example, for biodegradability. We have high technology standards and infrastructure for the disposal of wastewater at our sites. In some cases, production effluent is pretreated in the production plants. Consequently, the effluent load of wastewater discharged into our own or third-party treatment facilities is moderate.

Evonik's water data 2023 303-1, 303-2, 303-3, 303-4, 303-5 C16

(in million m^3 p.a.)[a]



[a] Figures in the chart are rounded. | [b] Recycling of water from third parties, including use of rainwater. | [c] Water used in chemical processes, including generation of steam and water for sanitary purposes. | [d] Water consumption in accordance with GRI Standard 303-5 (2018). | [e] Freshwater.

At Marl Chemical Park in Germany, sewage sludge is dewatered in our own treatment plant and subsequently incinerated in our own facilities with integrated flue gas treatment. We use some of the exhaust gases from the production plants as substitute fuels. The incineration gases are then used to generate 20 bar steam. Wastewater discharged from our sites is carefully monitored, for example, by regular sampling and measuring equipment that operates continuously. These analyses support the management of our wastewater treatment facilities. Moreover, many analyses are required by legislation on self-monitoring. In addition, the authorities frequently perform unannounced checks to monitor discharges.