Wastewater loads[a] 303-2 T10

in metric tons	2022	2023
Chemical oxygen demand (COD)	1,433	1,316
Total nitrogen (N)	143	185
Total phosphorus (P)	33	37
Absorbable organic halogen compounds (AOX)	1.2	1.4
Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)	1.3	1.4

[a] Direct discharges only.

In 2023, we discharged a total of 397 million m^3 wastewater, including 7 million m^3, which was channeled to third-party facilities (e.g., municipal facilities) for treatment (indirect discharge). 47 million m^3 were discharged directly into water via our own drainage system after treatment in Evonik wastewater treatment facilities. These direct discharges also include amounts accepted from third parties for treatment at the wastewater treatment facilities operated by us at chemical parks. Since 2021, our external reporting has only disclosed the wastewater loads of direct discharges. In view of this, data from 24 direct discharge sources were included in the reporting period.

Organic substances—expressed as chemical oxygen demand (COD)—account for the highest proportion of our wastewater loads. COD is the concentration of all substances in the wastewater that can be oxidized under certain conditions. The decrease in COD was mainly attributable to the reduction in production. The increase in total nitrogen (N) emissions was caused by the temporary malfunctioning of one of our wastewater treatment plants.

Waste management

Strategy and management

Our efforts to further reduce production waste are aligned with a clear principle: the first priority is to avoid waste; otherwise waste should be recycled or used to generate energy. As a third option, if this is not possible, it should be disposed of safely. Evonik uses this principle to implement the five-step waste hierarchy defined by EU legislation. As a specialty chemicals company, we are involved in research and development work on mechanical and chemical recycling (see "Value chain and products" p. 33).

Between 2021 and 2030, we aim to reduce specific production waste relative to production volume by 10 percent. We want to achieve this by implementing a wide range of measures at our production sites. These measures were identified, for example, in the EAGER project. In addition, we are continuing our work on a waste management system.

Continuous optimization of production processes contributes to avoiding and minimizing waste. That includes in-plant reprocessing of substance streams and the use of highly specialized catalysts to minimize side reactions. Where waste is unavoidable, the focus is on mechanical or thermal reprocessing. At our sites, various types of recyclable waste, such as glass, paper, and wood, are collected separately and sent to external recycling firms. We regularly monitor these firms through audits to review their suitability in conformance with statutory provisions.

We also use the benefits of integrated production sites and systems for systematic waste management. By-products of a production process are used as raw materials in other production plants. For example, at the integrated C4 production facilities at

Waste management[a,b] 306-4, 306-5 T11

	2022	2023	2022	2023
in thousand metric tons	internal	internal	external	external
Incineration with recycling of heat energy	16	10	25	27
Disposal by incineration	43	43	32	15
Recycling (including composting)	52	34	71	62
Landfill	2	0	55	54
Chemical/physical/biological treatment	9	9	19	17
Other reprocessing methods	2	4	75	44
Other disposal methods	1	1	25	29
Total	**125**	**100**	**302**	**248**

[a] Differences between the data and totals are due to rounding. | [b] Only includes waste streams in the gate-to-gate process.

Waste [a, b] 306-1, 306-2, 306-3, 306-4 T12

in thousand metric tons	2021 internal	2022 internal	**2023 internal**	2021 external	2022 external	**2023 external**	2021 internal and external	2022 internal and external	**2023 internal and external**
Hazardous production waste, reprocessed	69	65	44	64	62	55	133	127	99
Hazardous production waste, disposal	68	45	45	36	50	36	104	95	81
Non-hazardous production waste, reprocessed	4	5	4	45	49	51	49	54	55
Non-hazardous production waste, disposal	13	10	8	43	49	45	55	59	53
Total production waste	**153**	**125**	**100**	**188**	**211**	**187**	**342**	**335**	**287**
Production in thousand metric tons							**9,540**	**8,380**	**7,503**
Specific production waste in metric tons per metric ton production							**0.036**	**0.040**	**0.038**
Development of specific production waste relative to the reference base 2021 in %							**0**	**12**	**7**
Hazardous building and demolition rubble, reprocessed	0	0	0	1	1	1	1	1	1
Hazardous building and demolition rubble, disposal	1	1	0	38	7	8	39	7	8
Non-hazardous building and demolition rubble, reprocessed	0	0	0	39	59	27	39	59	27
Non-hazardous building and demolition rubble, disposal	0	0	0	31	25	26	31	25	26
Subtotal building and demolition rubble	**1**	**1**	**0**	**109**	**92**	**61**	**109**	**92**	**61**
Total	**154**	**125**	**100**	**297**	**302**	**248**	**451**	**427**	**348**

[a] Differences between the data and totals are due to rounding. | [b] Only includes waste streams in the gate-to-gate process.

our site in Marl (Germany), we produce butadiene, butene-1, MTBE (methyl-tert-butylether), isononanol, and plasticizers. Integrated management means that waste products can be used in nearby plants. At Marl Chemical Park, liquid organic residues are used as a substitute for heating oil in the gas synthesis plant at this site, and waste sulfuric acid is recycled in the sulfuric acid plant.

Alongside reprocessing methods, waste with a high calorific value ("substitute fuel") is used to produce energy. This reduces the use of primary fossil fuels. We use some of the exhaust gases from production plants as substitute fuels. Heat from the substitute fuels and incineration gases is used to generate steam.

In our analysis of waste management/circular economy, we distinguish between waste processed on-site and waste transferred off-site. Waste transferred off-site physically leaves our reporting boundaries as "genuine" waste. By contrast, waste processed on-site is recorded as waste, but its environmental impact is generally only registered for the by-products of the various treatment steps, for example, as CO_2 from incineration T11 p. 60.

In 2023, total waste decreased by 19 percent year-on-year to 348,000 metric tons. The reduction in production waste was mainly attributable to the reduction in production in 2023, while the reduction in building and demolition rubble was due to a reduction in construction activity. Construction activity depends on specific measures and may vary considerably from year to year. The percentage of waste reprocessed comprises recycled substances, incineration with recycling of heat energy, and other disposal methods. The reprocessing rate decreased to 52 percent in 2023 (2022: 56 percent).