Evonik Carbon Footprint[a] 305-3, 305-5 **T06**

Greenhouse gas emissions in million metric tons CO_2e		2021	2022[c]	**2023**[d]
Scope 1	Direct energy- and process-related emissions	4.4	4.2	3.8
Scope 2	Indirect emissions from purchased energy (gross, market-based approach)	1.9	1.8	1.5
Scope 3[b]	Category 1: Purchased chemical raw materials, packaging materials, and indirect goods and services	13.0	11.2	10.6
	Category 2: Capital goods	0.3	0.3	0.4
	Category 3: Energy-related activities (not included in scope 1 and 2)	1.7	1.5	1.0
	Category 4: Upstream transportation and distribution	1.1	1.0	1.0
	Category 5: Disposal and recycling of waste	0.3	0.3	0.3
	Category 6: Business travel	0.01	0.03	0.02
	Category 7: Employee commuting	0.06	0.05	0.04
	Category 8: Upstream leased assets (company cars, electricity and heating of administrative buildings)	0.00	0.00	0.00
	Category 9: Downstream transportation and distribution (to direct customers)	0.05	0.04	0.04
	Category 11: Use of sold products (direct emissions only)	4.2	3.1	3.2
	Category 12: Disposal and recycling of products	2.8	3.0	2.7
Reduction in scope 3[e] GHG emissions versus 2021 in %		**–**	**– 13**	**– 17**
GHG emissions, total scope 3		**23.4**	**20.5**	**19.2**
thereof upstream		*15.3*	*14.4*	*13.3*
thereof downstream		*6.3*	*6.1*	*5.9*
GHG emissions Evonik Carbon Footprint (sum of scope 1, 2, and 3)		**29.7**	**26.5**	**24.6**

[a] The fast close process reporting was used for this reporting period, see "About this report" **p. 149.** Differences between the data and totals are due to rounding. The inventory covers fossil greenhouse gas emissions and emissions of gases—other than CO_2—of biogenic origin. Moreover, scope 3 categories 1 (–1.3 million metric tons biogenic CO_2e), 11 and 12 (approximately +0.8 million metric tons biogenic CO_2e together), and direct scope 1 process emissions (+1.0 million metric tons CO_2) entail relevant use of biomass with the associated net amounts of CO_2 removal and biogenic CO_2 emissions. In the past, the net biogenic amounts were: scope 3 category 1 approximately –1.4 (2021) / –1.3 (2022) million metric tons CO_2; scope 3 categories 11 and 12 together approximately +1.0 (2021)/+0.9 (2022) million metric tons biogenic CO_2. The corresponding direct process emissions (scope 1) were constant at around +0.1 million metric tons CO_2 in 2021 and 2022.

[b] Some calculations are based on assumptions and estimates. Scope 3 category 10 "Processing of sold products" is not reported due to its complexity; categories 13 "Downstream leased assets," 14 "Franchises," and 15 "Investments" are not disclosed separately as they are not applicable or not significant.

[c] Since the economy was weaker in the second half of 2022 than in the first half of 2022, resulting in a reduction in production activity, emissions in the fourth quarter of 2022 were overestimated as the fast close process used a projection based on the first three quarters. As a result, the data for the full year had to be corrected. Therefore, the figures for 2022 in the present report differ from those reported in the sustainability report 2022.

[d] To calculate the emissions data for 2023, the IPCC AR6 - GWP100 impact assessment method (Sixth Assessment Report IPCC AR6 (2021), which is based on a 100-year period) was used where possible to determine scope 3 emissions, instead of the previous method developed by the University of Leiden (CML2001- Aug. 2016).

[e] Scope 3 emissions from all upstream categories and the category "Downstream emissions from transportation and distribution" as defined in our SBTi target.

The data in table **T06** cover fossil GHG emissions and biogenic GHG emissions other than CO_2. Net amounts from CO_2 removals (due to biological carbon sequestration by biomass at the beginning of the life cycle) and biogenic CO_2 emissions are reported separately.

The development of our direct energy- and process-related emissions, our indirect emissions from purchased energy, and greenhouse gas emissions along our value chain, including the contribution made by the individual categories in the GHG Protocol Standard, are presented for 2021 (baseline), 2022, and 2023 in table **T06**.

In 2023, greenhouse gas emissions decreased to 24.6 million metric tons CO_2e, compared with 26.5 million metric tons CO_2e in 2022. This was mainly due to a cyclical reduction in business activities, which was reflected in lower procurement, production, and sales volumes.

Other emissions into the air

Alongside emissions of greenhouse gases as reported above, energy generation and industrial production result in further emissions into the air. We want to reduce these further and therefore take the emissions situation into account when planning new facilities. Our clean air measures include returning exhaust gases to the production process, thermal processing of residual gases with a high calorific value (as substitutes for natural gas), the use of electric filters to remove particulates, the use of catalysts to reduce nitrogen oxide, and desulfurization by washing with subsequent precipitation. We also use other methods to reduce emissions from production facilities. Examples are wet and dry scrubbing, condensation, adsorption, and thermal and catalytic incineration. Some of these emissions treatment facilities are used simultaneously by several units.

Other emissions into the air 305-6, 305-7 **T07**

in metric tons	2022	2023
Carbon monoxide (CO)	800	803
Sulfur oxides (SO_x/SO_2)	1,185	1,027
Nitrogen oxides (NO_x/NO_2)	3,192	2,803
Non-methane volatile organic compounds (NMVOC)	994	741
Particulates	449	484
Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)	0.31	0.26
Ozone-depleting substances[a] in metric tons CFC-11 equivalents	0.30	0.29

[a] Emissions of ozone-depleting substances calculated in accordance with the Montreal Protocol.

The other emissions into the air declined in 2023 as a result of lower production output and the reduced use of coal for energy generation at Marl Chemical Park. The coal-fired power plant in Marl will be finally decommissioned at the end of March 2024 in accordance with the statutory requirements. That will bring a significant reduction in emissions into the air (excluding greenhouse gas emissions). Based on the data for 2023, we assume the following reductions:

- Nitrogen oxides (NO_x/NO_2): –1,000 metric tons
- Sulfur dioxide (SO_x/SO_2): –500 metric tons
- Particulates: –25 metric tons
- Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn): –0.05 to –0.07 metric tons

305-6, 305-7

Very low level of ozone-depleting substances

The ozone-depleting chlorofluorocarbons (CFCs) are presently only used as refrigerants on a very restricted basis as a transitional solution in line with national and international regulations. Emissions of ozone-depleting substances fluctuate at a low level due to aperiodic replenishment of refrigerant systems. Consequently, they were again very low in 2023. The main substitutes at present are partially fluorinated hydrocarbons (HFCs), which are used in decentralized air-conditioning systems and small process cooling systems. These substances do not harm the ozone layer, but they have a significant impact on the climate. We anticipate that these refrigerants will be replaced by more climate-friendly products in the mid-term. The greenhouse gas potential of the refrigerants is shown in table "Greenhouse gas emissions" T05 p. 51.

Green energy

Strategy and management

Green energy is one of Evonik's three most important material topics. In the reporting period, we made good progress with the strategic transformation of Evonik in this area. The focus at our sites is clearly defined: In the long term, supply will be switched to energy from renewable resources. More than 50 sites in Europe, Asia, and North and South America currently source or generate sustainable energy. That avoids around 410,000 metric tons of CO_2 a year. Our energy management system ensures a continuous and lasting increase in energy efficiency. We have already optimized more than 80 percent of our global energy requirements using an ongoing, certified process.

Significant increase in the proportion of green electricity

In the future, our European sites will be far less dependent on fossil fuels. In 2022, we signed a long-term power purchase agreement (PPA[1]) with EnBW for the supply of green electricity from the planned 960 Megawatt (MW) He Dreiht offshore wind farm, starting in 2026. Further PPAs were concluded in December 2023. From 2025, Evonik will source electricity from Vattenfall under a ten-year PPA. This will come from the approximately 120 MWp[2] installed capacity at the locations that are being erected in northern Germany. Furthermore, under a ten-year PPA with RWE, from 2028, we will be sourcing approximately 37.5 GWh p.a. green electricity from the Kaskasi offshore wind farm, which started operating in 2023. These long-term agreements ensure the financial viability and realization of these projects and help advance the energy transition. Evonik compensates for fluctuations in the wind energy and solar power feed-in through its own balance group management. This shows that we have a keen eye on the reliability of supply, can avoid potential bottlenecks, and safeguard the long-term operation of our production facilities.

[1] PPAs are long-term power supply agreements between a producer (e.g., a wind farm operator) and a major customer (e.g., an industrial company).
[2] MWp = Megawatt peak.