



Environment



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Management approach Climate change

The effects of climate change are already clearly noticeable. Companies need to systematically address the climate crisis and take effective measures to support climate change mitigation and adaptation. We analyze the resulting risks and opportunities for our Group in accordance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). We plan to regularly repeat the comprehensive analysis of climate and other ESG risks and integrate it into company-wide risk management routines. We

reassessed our greenhouse gas emissions (Scope 1, 2 & 3) in 2023 and established Group-wide science-based targets that were approved by the relevant internationally recognized body. In 2023, we received an “A-” rating from Carbon Disclosure Project (CDP) for the detail and transparency of our reporting on climate data, climate protection targets, and progress. We are determined to do our part in driving the transformation to a sustainable future in which climate protection and economic success go hand in hand.

Our impact in the value chain:

○ upstream processes ○ own processes ○ downstream processes

Actual & potential impacts

Positive

- Direct CO₂ emissions are reduced through the increasing use of non-petroleum-based energy sources and targeted energy efficiency measures
- Upstream and downstream CO₂ emissions are reduced through the establishment of sustainable sourcing and the use of lower-emission materials along the entire value chain
- Development of sustainable product solutions increases the range of climate-friendly alternatives for customers
- CO₂ emissions are reduced along the entire value chain through collaborations and cross-sector projects
- Our science-based targets for suppliers encourage them to reduce their CO₂ emissions and thus make a positive contribution themselves
- We contribute to raising awareness on a broad scale with targeted communication measures and competence building

Negative

- The use of fossil fuels leads to greenhouse gas emissions along the entire value chain
- Our processing and manufacturing processes are energy and emission intensive
- Processing petroleum-based plastics produces upstream greenhouse gas emissions
- Most of our products are incinerated after the use phase, which has a negative downstream impact on the environment and climate

Implemented measures & policies

- We introduced absolute science-based climate targets for Scopes 1, 2 and 3
- We created a Renewable Electricity Guideline and developed a Group-wide energy sourcing strategy to drive the gradual expansion of renewable electricity as a share of total power consumption
- We conducted ongoing potential analysis and increased the share of photovoltaic generated power
- We developed division-specific energy targets to increase energy efficiency and reduce energy consumption
- We provided transparency by participating in CDP's climate change program and achieving an A- rating
- We calculated product carbon footprints and developed CO₂ reduction solutions
- We broadened in-house knowledge of sustainable product development through the development and implementation of training courses
- We constantly expand ISO 14001 and ISO 50001 certifications

Targets

- 60% reduction in absolute Scope 1 and Scope 2 emissions by 2030 (base year 2021)
- 25% reduction in absolute Scope 3 emissions by 2030 (base year 2021)¹
- 80% of Scope 3.1 emissions (purchased goods and services) are covered by suppliers with science-based targets by 2027
- 2.5% self-produced renewable electricity by 2030
- 100% renewable electricity by 2030
- Improvement in energy intensity by 2030
Greiner Packaging: 7.5% improvement (base year 2021)²
NEVEON: 15% improvement (base year 2021)³
Greiner Bio-One: 10% improvement (base year 2018)⁴
- Increase number of management systems⁵
- CDP climate: A rating by 2024

Performance & target achievement

- See [Overview of 2023 sustainability performance](#)

¹ Fuel- and energy-related activities (3.3), upstream and downstream transportation and distribution (3.4 and 3.9), end-of-life treatment of sold products (3.12) ² Electricity consumption (kWh) / amount of finished products (kg) ³ Energy consumption (whole year) / gross margin (EUR) ⁴ Electricity and gas consumption (kWh) / plastics used (kg) ⁵ ISO 9001 or equivalent, ISO 14001 and ISO 50001

Climate & emissions



Nothing beats protecting the climate and lowering emissions. We have set ourselves science-based targets to protect the climate and limit global warming. Our focus is on the significant and sustainable reduction of our direct and indirect emissions. To achieve this, we collaborate closely with stakeholders along the entire value chain.

In 2023, our emissions as a Group totaled around 2.6 million tons of CO₂e (all Scopes), which roughly equates to the average annual emissions of 329,054 Europeans. To help mitigate climate change, we are committed to dramatically reducing our greenhouse gas emissions. As a manufacturing company, we cause direct emissions through our own economic activities, such as burning fossil fuels to generate heat or operating our vehicle fleet. However, we also have responsibility for indirect

greenhouse gas emissions that occur upstream and downstream in our value chain and throughout the life cycle of our products. Examples of these include the emissions due to the manufacture of purchased goods and services, or emissions from the disposal of our products. Most of our total emissions come from upstream activities, as the materials we process already have a considerable environmental impact when they are extracted, processed and transported.

Our corporate carbon footprint

The annual calculation of our corporate carbon footprint tells us where we stand in terms of implementing our sustainability strategy for climate change mitigation. The corporate carbon footprint shows us whether our activities are effective, and it helps us to keep a close eye on our performance in the individual action areas. In line with Greenhouse Gas Protocol guidance, we consider Scopes 1, 2 and 3 when calculating our CO₂ emissions.

In 2018, we started our carbon accounting process and initially only calculated our company's Scope 1 and Scope 2 emissions. Since 2020, we have progressively included more and more Scope 3 categories in our reporting and continuously worked to improve the data situation. By gradually expanding the system boundaries, we have been able to gain an increasingly accurate picture of our direct and indirect greenhouse gas emissions along the entire value chain in recent years.

We use 2021 as the base year for our climate objectives, as this was when we first performed a full Scope 3 screening, and we have covered all relevant sources of emissions since then. In this screening, we precisely analyzed all 15 Scope 3 categories and defined those to be regarded as significant based on their respective relevance. Since 2021, we have been calculating the following Scope 3 categories: (3.1) purchased goods and services, (3.2) capital goods, (3.3) fuel and energy-related activities, (3.4) upstream transportation and distribution, (3.5) waste, (3.6) business travel, (3.7) employee commuting, (3.9) downstream transportation and distribution, (3.12) end-of-life treatment of sold products and (3.15) investments. In 2023, we also included category (3.13) leased assets in our calculations.

Total Scope 3 emissions declined by 283,821 tons of CO₂e (ten percent) compared to 2022, mainly as a result of reduced procurement of goods and services. Scope 3 emissions accounted for 96 percent of total emissions in 2023. Total Scope 1 and Scope 2 emissions increased by 3,232 tons of CO₂e (3.5 percent) compared to 2022. This is mainly due to the lower share of green electricity in overall electricity consumption.

Scope 1

includes direct emissions from sources our organization owns or controls – for example, emissions from combustion processes.

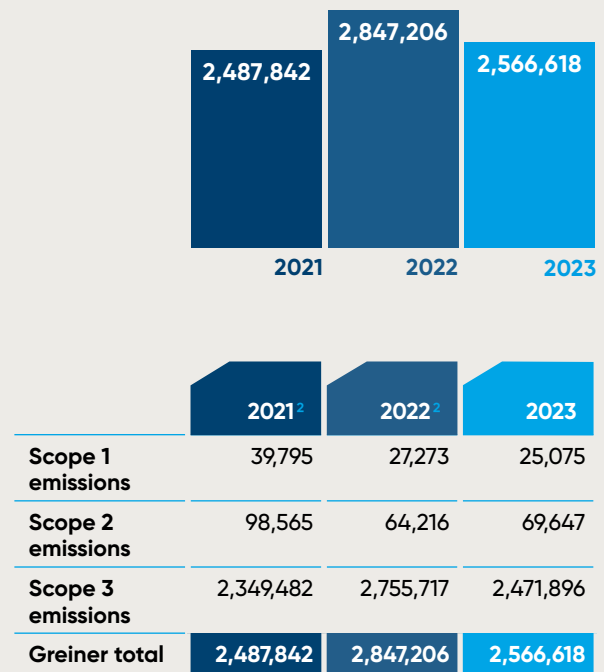
Scope 2

relates to indirect emissions from purchased electricity, steam, cooling or heating outside our company.

Scope 3

includes all other indirect emissions arising from activities outside the company, such as the manufacture and transportation of purchased goods and services or the use and disposal of our products.

Scope 1, 2¹ & 3 emissions [in t CO₂e]



¹ Scope 2 location-based emissions amount to 167,342 t CO₂e in 2023 (184,440 t CO₂e in 2022) ² Data has been corrected since previous publication.

Calculation methodology

Emissions are calculated based on our activity and consumption data, which we gather in the software that we use to collect non-financial key figures. These are converted into greenhouse gas emissions using emission factors from both primary and secondary data, which is provided by suppliers or scientific life cycle assessment databases. Taking into account the geographic, temporal and technological references, Ecoinvent 3.9 was the preferred database for calculating the greenhouse gas emissions of our purchased goods and services. In particular, the GaBi and DEFRA databases are used to calculate greenhouse gas emissions from our energy consumption. Where no suitable factors are available in this regard, emission factors from scientific studies or derived emission factors are used.

Product or supplier-specific factors were included in the calculation for electricity emissions and some district heating emissions. If market-based factors are not available for the Scope 2 emissions calculation, the appropriate residual mix or location-based emission factor is used. This calculation methodology follows the guidelines of the Greenhouse Gas (GHG) Protocol for market-based Scope 2 calculations. Moreover, in line with the recommendations of the GHG Protocol, Scope 2 emissions are reported twice to show the difference between location-based and market-based emissions from energy production (“dual reporting” with market-based and location-based emissions).

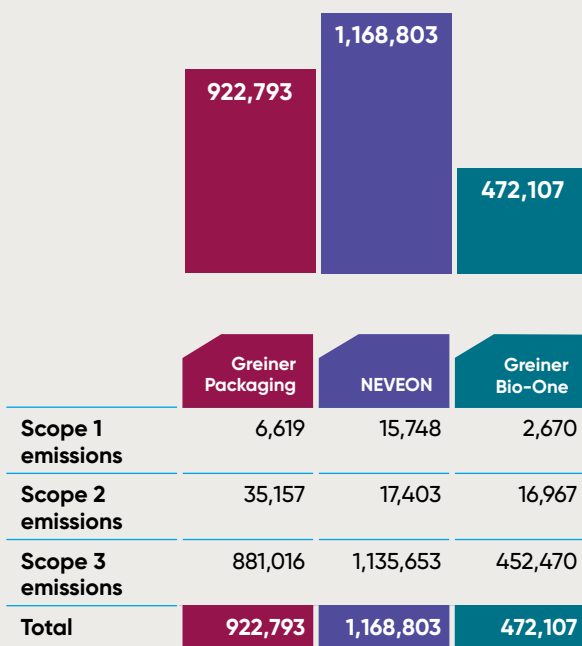
We also continued to work on improving data quality. Primary data and product carbon footprints of our suppliers were used for the first time in 2023 to calculate emissions in the Scope 3 category 1 “purchased goods and services” for 2,784 tons of purchased materials. Our goal in 2024 is to work even more closely with our suppliers in this area to increase the use of primary data.

We do not generate biogenic emissions in any categories. In addition to carbon dioxide (CO₂), the calculations include the six other greenhouse gases covered by the Kyoto Protocol: methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (FCs and HFCs) and nitrogen trifluoride (NF₃). They are converted to the climate impact of CO₂ and reported as CO₂ equivalents (CO₂e). This does not include the emission values reported on electricity bills for determining the market-based Scope 2, which in most cases is reported by electricity suppliers only in CO₂ emissions. For the Scope 3 category “fuel- and energy-related activities” not included in Scopes 1 and 2, no data was available to us from the electricity suppliers, which is why we used location-based emission factors.

The operational control approach was used as the consolidation approach for calculating emissions because this is most consistent with our corporate structure. Under this approach, emissions from joint ventures in which we hold an equity share of less than 50 percent and so do not have operational control are allocated to the Scope 3.15 category “investments”.

Scope 1, 2, & 3 emissions by division

[in t CO₂e]



Direct emissions (Scope 1) and indirect emissions from purchased energy (Scope 2)

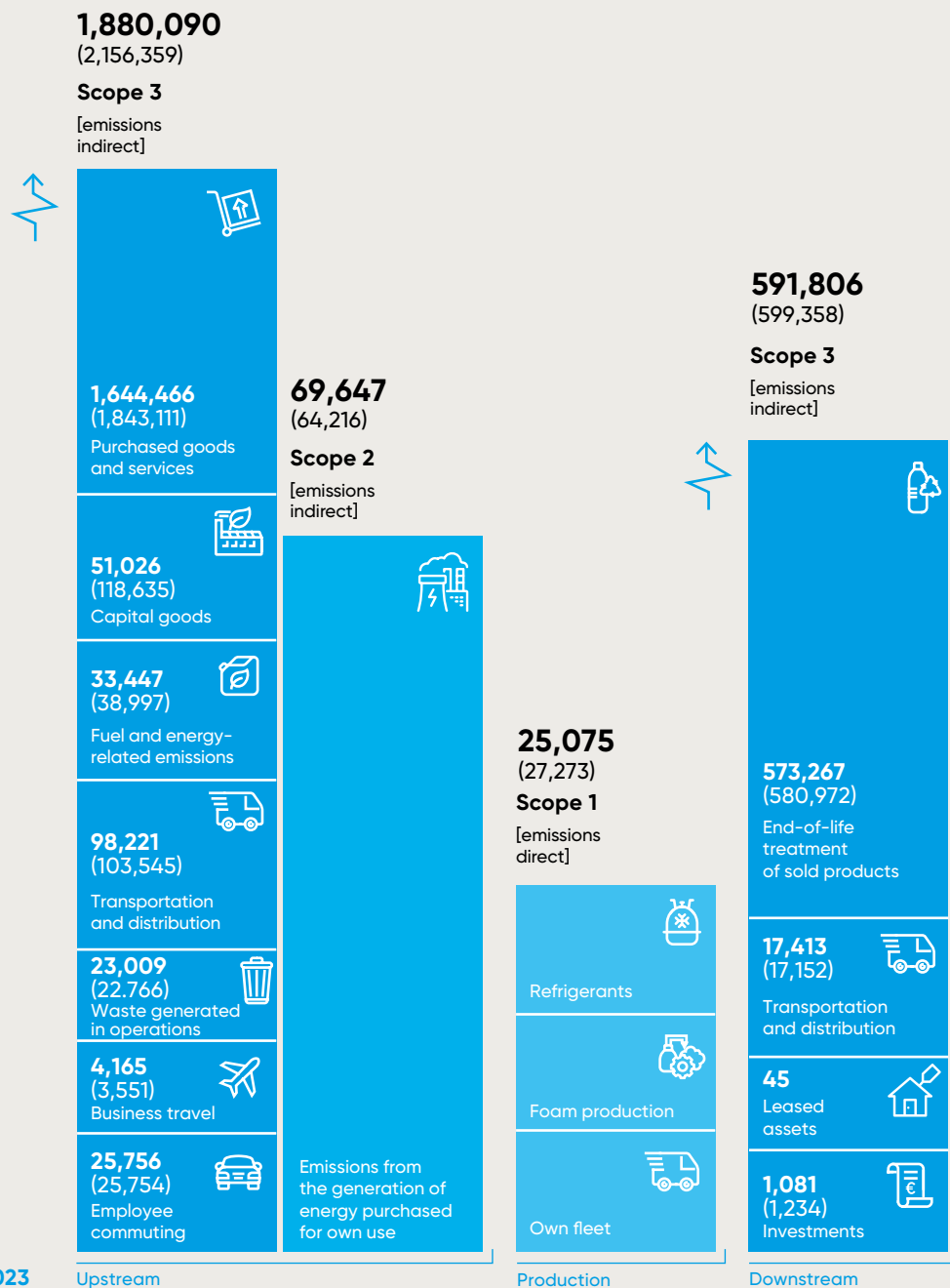
The Scope 1 emissions category covers all greenhouse gas emissions that are released by us directly. This category includes emissions from refrigerants, our own vehicle fleet, and process-related emissions from foam production. Indirect emissions resulting from the generation of electricity, steam, heat, or cooling that we purchase from third parties are included in Scope 2. No biogenic emissions were generated as part

of Scope 1 or Scope 2 emissions. In 2023, Scope 1 emissions were 25,075 tons of CO₂e. Market-based Scope 2 emissions were 69,647 tons of CO₂e in 2023, which is 58 percent below the location-based Scope 2 emissions of 167,342 tons of CO₂e. Scope 1 emissions are down by 8.1 percent as against 2022.

However, Scope 2 emissions rose by 8.5 percent compared to 2022 on account of the relatively lower purchasing of green electricity. In order to reduce these emissions moving ahead, we will increasingly rely on renewable and self-produced energy.

→ Read more under: [Environment / Climate change / Energy](#)

Detailed breakdown of our CO₂ emissions³ [in t CO₂e]



³ Numbers in brackets are data for 2022. Data has been corrected since previous publication.

2023

Upstream

Production

Downstream

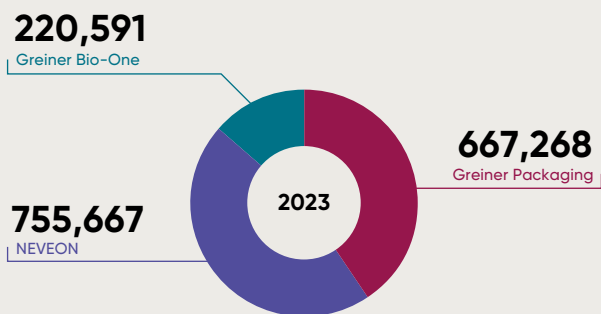
Emissions from purchased goods and services (Scope 3.1)

Our purchased goods and services led to emissions of 1,644,466 tons of CO₂e in 2023, accounting for 67 percent of our Scope 3 emissions. The two largest sources of emissions are the plastic raw materials used in Greiner Packaging as well as the chemicals used in NEVEON's foam production. Regulatory requirements, such as quality and safety standards for medical products, limit the use of recycled materials – which often have a better GHG performance than virgin materials – in our product portfolio.

We have started to collect supplier-specific emission factors to evaluate and compare the environmental impact of purchased products. We used these factors for 2,784 tons of purchased goods. In keeping with our targets, which have been verified by the Science Based Targets initiative, we are increasingly asking our suppliers to reduce their emissions, thereby reducing emissions upstream in our supply chain. To support this goal, we trained our buyers in sustainable sourcing in 2023.

→ Read more in the section on [Governance/Sustainable supply chains](#)

Emissions from purchased goods and services [in t CO₂e]



Greiner total⁴
1,644,466
2023

⁴ Contains emissions by Greiner AG.

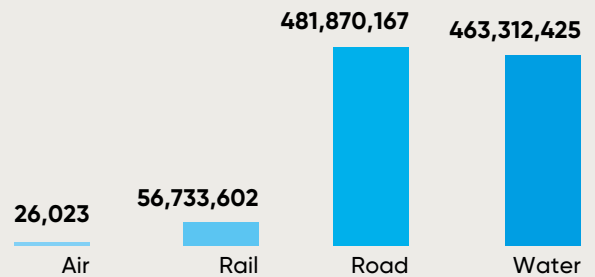
Emissions from our upstream transportation and distribution (Scope 3.4)

Politicians, the general public, our business partners, and our customers all attach great importance to sustainable logistics concepts that take into account not only environmental aspects but also social aspects. In our Environmental Policy, we commit to focusing more on short transportation routes, environmentally friendly and resource-saving means of transport, route-optimized transport planning, and innovative transport solutions. We also want to work on sustainable logistics solutions in our partnerships with our suppliers and customers. Upstream, our products are largely transported on the roads by truck. We primarily use container shipping to exchange goods and materials with Asia and America. For individual products, we also turn to air and rail freight. We can reduce emissions by pooling transport and switching to low-emission modes of transport.

We source our goods and services locally wherever possible. This helps to keep transport distances short. If local procurement is not possible, we look for the most sustainable mode of transport, taking into account the urgency of the delivery. Our upstream transportation and distribution includes the transportation and distribution of purchased goods between suppliers (tier 1) and our company and between our own sites in vehicles that do not belong to us and are not operated by us.

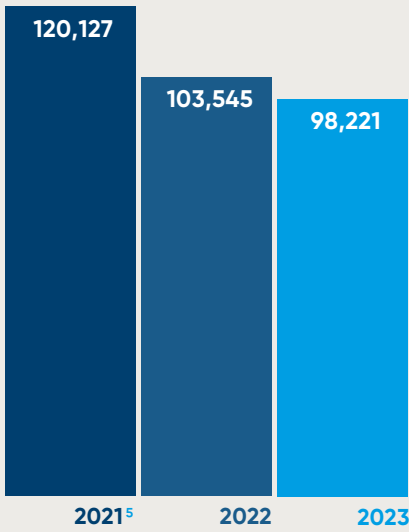
A total of 1,002 million ton kilometers (tkm) was transported in our upstream logistics channels in 2023 – by air, water, road and rail. Our upstream transportation and distribution generated a total of 98,221 tons of CO₂e in 2023, around five percent less than in 2022.

Upstream transportation & distribution 2023 [in t km]



Greiner total
1,001,942,217
2023

Emissions caused by upstream transportation & distribution [in t CO₂e]



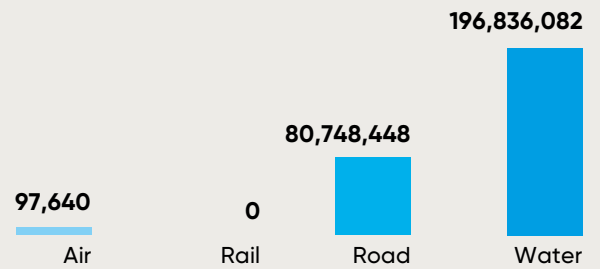
Emissions from our downstream transportation and distribution (Scope 3.9)

The data provided regarding downstream transportation and distribution takes into account the distribution of sold products between our company and customers in vehicles that do not belong to us and are not operated by us. A total of 278 million ton kilometers was achieved in 2023 on our downstream logistics routes, equivalent to 17,413 tons of CO₂e. The underlying data is recorded centrally in our system using shipping weights and origin and destination points. Incoterms were also used to estimate outbound logistics. Data from the previous year was used if no Incoterms data was available for the current financial year. We are constantly working on improving data quality in this area as well.

As part of our science-based targets, one of our commitments is to reduce emissions generated in our upstream and downstream transportation operations. That is why we are working with our customers and suppliers to analyze the current situation and develop climate-friendly solutions. For example, we reduce our transport emissions by developing lighter and space-saving products and by optimizing the packaging of the goods transported.

⁵ Data has been corrected since previous publication.

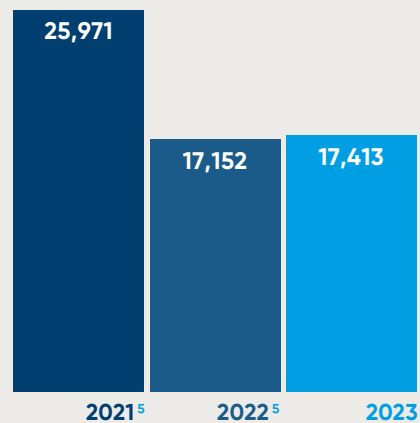
Downstream transportation & distribution 2023 [in t km]



Greiner total

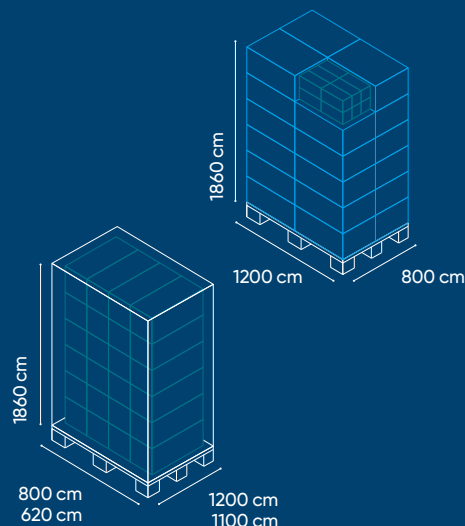
277,682,170
2023

Emissions caused by downstream transportation & distribution [in t CO₂e]



Reducing emissions by increasing efficiency

Last year, Greiner Bio-One reduced transportation and logistics emissions by optimizing the packaging of its safety blood collection sets. Since there was wasted space on the sides of the cartons when stacked on Euro and industrial pallets, as well as a lot of wasted space inside the cartons, the strategic purchasing department developed a new packaging design. A joint project team consisting of people from Product Management and Research & Development was able to analyze the volumes and optimize the packaging. This resulted in supply chain efficiencies and a reduction of approximately 170 metric tons of CO₂e from reduced cardboard consumption alone.



Waste emissions (Scope 3.5)

Emissions from our operational waste totaled 23,009 tons of CO₂e in 2023. Emissions rose by one percent compared to 2022. We calculate our waste emissions using the “cut-off by classification” method to ensure accurate reporting of different waste emission categories. As a result, we allocate all emissions generated by the recycling of waste to the downstream value chain. Indirect emissions from recycled waste are therefore not included in our corporate carbon footprint. If no information is provided on the disposal method, we apply the conservative approach and assume the most emission-intensive scenario for the respective waste type. We used Ecoinvent emission factors for the disposal scenarios.

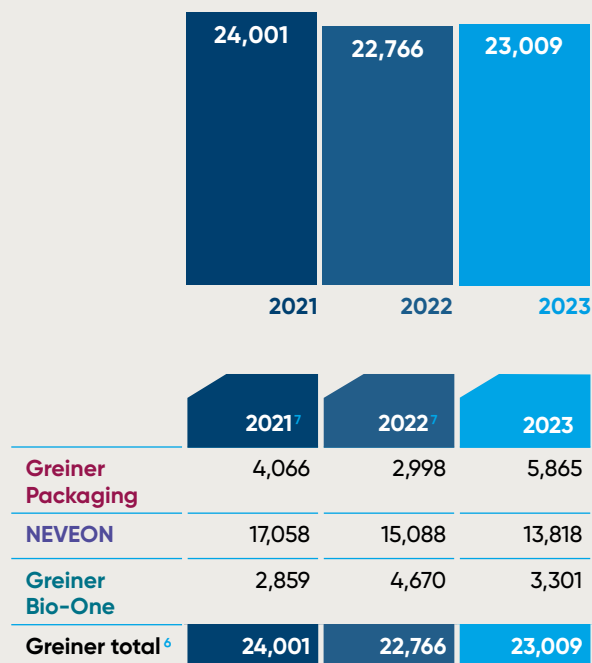
As part of our work on our Group-wide waste management approach, last year we focused on improving the quality of the waste data collected by developing Group-wide, standardized definitions of waste streams and giving specialist presentations.

→ Read more under: [Environment / Resource use & circular economy / Waste](#)

⁶ Contains emissions by Greiner AG.

⁷ Data has been corrected since previous publication.

Waste emissions [in t CO₂e]



Emissions due to end-of-life treatment of sold products (Scope 3.12)

Emissions due to the end-of-life treatment of sold products amounted to 573,267 tons of CO₂e in 2023. This is equivalent to 22 percent of our total emissions and, after purchased goods and services, is our second-largest source of Scope 3 emissions. A comparison of the divisions shows that more than 50 percent of these emissions were attributable to NEVEON in 2023.

As part of our science-based targets, one of our commitments is to reduce emissions generated due to the end-of-life treatment of sold products. In 2023, for example, NEVEON successfully produced high-quality mattresses with a recycled content of 80 percent in the polyol component. They are made from a repolyol that is 100 percent derived from old mattresses using a recycling process developed by BASF. In addition to reducing the emissions that arise when our products reach the end-of-life phase, these developments also make a key contribution to a circular economy.

→ Read more under: [Our Performance / Divisions / NEVEON](#)

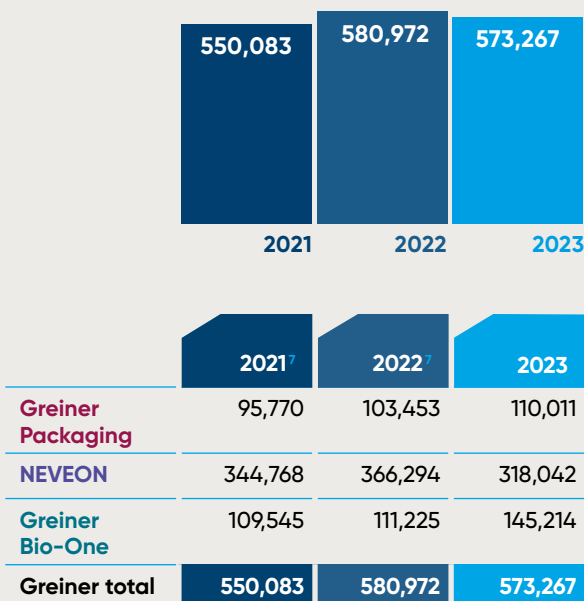
Other climate protection measures

We implemented additional climate protection measures at the Group and divisional level during the year. These activities were carried out in the field of climate-friendly mobility, for example, which is a key factor in advancing the energy transition and raising awareness. That's why we are offering all employees at our Austrian sites the opportunity to lease and insure a bicycle or e-bike through the company. They are available at reduced rates and can be used for both work and leisure. Some 192 of these job bikes were already in use in 2023. Furthermore, we have set up a pilot shuttle service to drive our employees from Kremsmünster train station to nearby sites. This allows a convenient journey with public transport. The Greiner Climate Ambassadors project was continued as well. In this project, employees are taught the skills they need to better understand the current climate crisis and to be active climate ambassadors within the company.

Intensity of greenhouse gas emissions

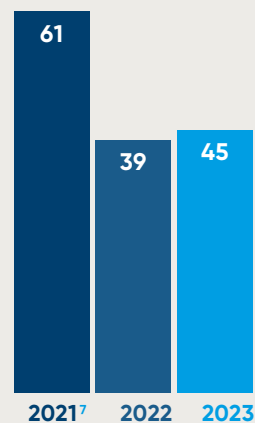
In addition to the key figures we need to meet our science-based targets, we also report our specific Scope 1 and Scope 2 emissions as a percentage of annual sales revenue. They were 39 kilogram CO₂e per thousand EUR sales revenue in 2022 and 45 kilogram CO₂e per thousand EUR sales revenue in 2023. This corresponds to an increase of 14 percent and relates to the lower total sales revenues and higher Scope 2 emissions.

Emissions due to end-of-life treatment of sold products [in t CO₂e]



Specific CO₂ emissions

[in kg CO₂e per thousand EUR in sales revenue]



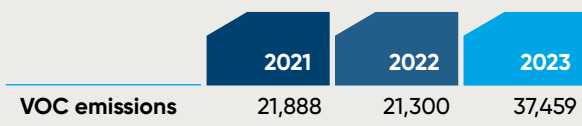
Other significant air emissions

Certain printing processes at Greiner Packaging cause emissions in the form of volatile organic compounds (VOCs). In printing, these emissions can come from various sources such as offset printing or the use of coating materials. Offset printing uses organic solvent-based inks and coatings that release VOCs as they dry. Ethyl acetate is a solvent commonly used in these materials that evaporates during the printing and drying process and contributes to VOC emissions.

The following table shows changes in VOC emissions over the last few years. Given the data available at present, it is not yet possible to calculate the greenhouse gas potential of our VOC emissions. However, we are working on improving data so as to provide this information in the future.

Absolute significant air emissions

[in kg VOC]



Science-based targets

We set new, more ambitious climate targets for 2023. We are committed to protecting the climate and limiting global warming to 1.5 °C. The Science Based Targets initiative has verified and endorsed the climate targets we submitted in 2023. This makes us one of 39 companies in Austria (as of March 2024) with confirmed science-based targets. The approval was largely attributable to the fact that the defined targets demonstrably contribute to achieving the Paris Agreement and thus limiting global warming.

Specifically, we are committed to reducing all absolute Scope 1 and Scope 2 emissions by 60 percent from the base year of 2021 by 2030.

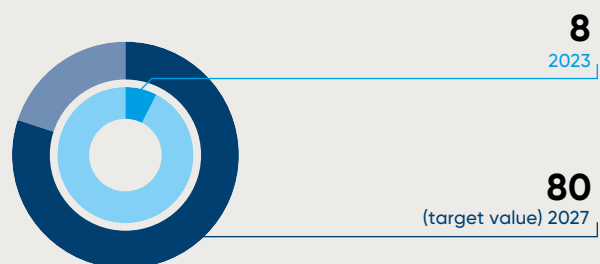
We are also committed to reducing selected absolute Scope 3 emissions by 25 percent from the base year of 2021 by 2030. These selected categories include emissions from the upstream and downstream value chain in the categories (3.3) fuel- and energy-related activities, (3.4) upstream transportation and distribution, (3.9) downstream transportation and distribution and (3.12) end-of-life treatment of products sold.

In addition, we have set a goal for 80 percent of our suppliers (as measured by emissions from purchased goods and services) to have science-based targets by 2027. Initial talks were held with suppliers in 2023 and there are plans to further intensify these efforts in 2024.

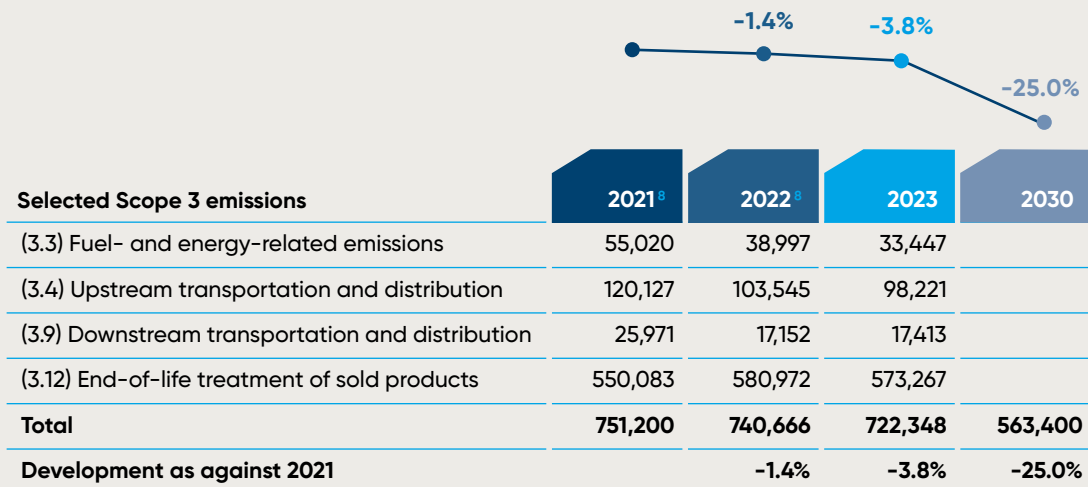
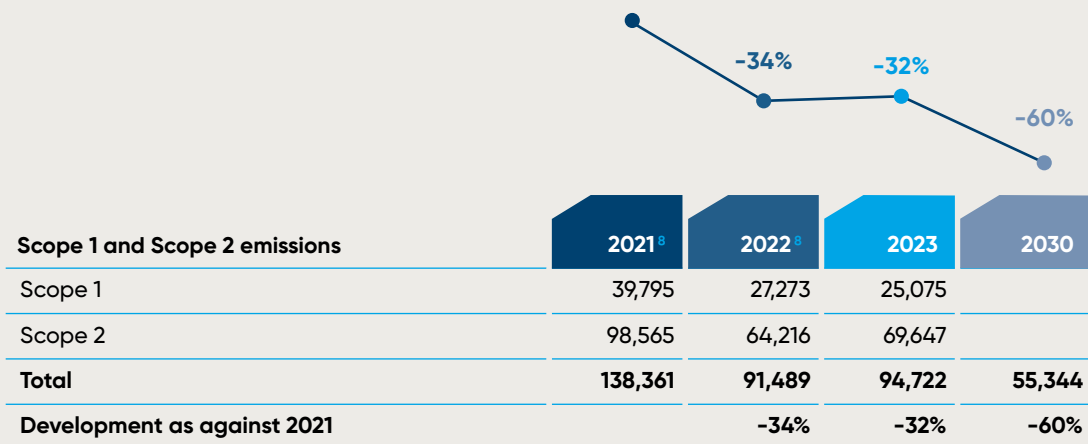
Compared to 2021, our Scope 1 and Scope 2 emissions have already decreased by 32 percent. In selected Scope 3 categories, they decreased by 3.8 percent. In addition, eight percent of our suppliers (as measured by emissions from purchased goods and services) have made a commitment to science-based targets.

Supplier commitment status [in %]

Share of suppliers (as measured by emissions from purchased goods and services) that have made a commitment to science-based targets.



Our science-based targets [in t CO₂e]



⁸ Data has been corrected since previous publication.

Monitoring and reporting

Reporting emissions transparently

We place great emphasis on transparency – including when it comes to our emissions. We therefore report our data to CDP every year. In 2022, we began publishing this information on the CDP platform, where it can be viewed by our investors and customers and transparently shared with all companies registered with CDP. With regard to the climate, we report climate-relevant information on our governance structures, risks and opportunities as well as our greenhouse gas emissions, our strategy, our objectives and specific initiatives and measures. For the first time, we received an “A-” rating from CDP for the detail and transparency of our reporting in 2023. We have therefore already achieved our goal of an A score by 2024. Nevertheless, we are already planning the next steps, namely the integration of climate-related risks and opportunities into our strategy and management processes, as well as the analysis of climate-related risks and scenarios.

→ Read more under: [Environment / Climate change / TCFD-relevant information](#)

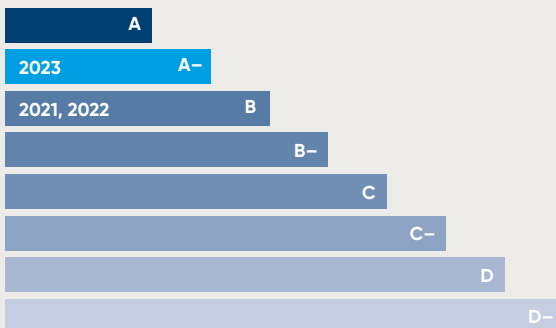
Data collection and data quality

Both the submission of our emissions data to the Science Based Target initiative and the ongoing improvements in data quality resulted in some corrections to previous emissions calculations. As a result of the updates, some of the emissions data published in this integrated report differs slightly from the data in the 2022 integrated report.

For example, Greiner Extrusion’s emissions were removed from the base year as the company was sold in 2022. In addition, Greiner AG data in the “purchased goods and services” category was added and 100 percent of emissions from joint ventures were allocated to the respective divisions as soon as the equity share exceeded 49 percent. The remaining joint ventures were allocated to Scope 3 category 15 “investments”. The proportion of Scope 1 and Scope 2 emissions included in the investments category is based on the equity share. This includes seven NEVEON joint ventures and one Greiner Packaging joint venture.

There has been another structural change since our science-based targets were submitted in that the Greiner Perfoam sites were sold in 2023. Owing to other necessary adjustments to our emissions data and in accordance with our base year recalculation policy, we are aiming to carry out this recalculation in 2024.

Our CDP climate score



Outlook: Emissions

We are committed to continually reduce our greenhouse gas emissions and thus our environmental impact. In our science-based targets, we have defined binding targets and a clear mandate to reduce our corporate carbon footprint on an ongoing basis. We wish to achieve this by deriving and implementing specific measures. In addition to promoting sustainable forms of energy, for example, this also includes

energy enhancement activities, investment in new and innovative technologies, process optimization and better cooperation along our value chain. The continuous monitoring of our progress and the holistic analysis of our processes allow us to ensure that we will achieve our emissions targets. We will also involve all our relevant stakeholders moving forward. After all, we can only achieve our climate protection goals by working together.

Overview of corrected emissions data [in t CO₂e]

	2021 emissions		2022 emissions	
	2022 Report	2023 Report	2022 Report	2023 Report
Scope 1 emissions	40,884	39,795	28,707	27,273
Scope 2 emissions⁹	99,852	98,565	62,878	64,216
Scope 3 emissions	2,384,565	2,349,482	2,738,849	2,755,717
Purchased goods and services	1,439,194	1,419,645	1,830,561	1,843,111
Capital goods	131,503	131,510	118,627	118,635
Fuel- and energy-related emissions	55,443	55,020	38,385	38,997
Upstream transportation and distribution	119,292	120,127	103,545	103,545
Waste	24,374	24,001	22,378	22,766
Business travel	1,913	1,809	3,483	3,551
Employee commuting	21,576	20,323	25,194	25,754
Downstream transportation and distribution	33,523	25,971	17,152	17,152
End-of-life treatment of sold products	557,201	550,083	577,568	580,972
Investments	546	994	1,956	1,234

⁹ The correct location-based Scope 2 emissions are 191,214 for 2021 and 184,440 tons of CO₂e for 2022 (in 2022 report: 208,906 for 2021 and 200,373 tons of CO₂e for 2022).

Energy

Using energy efficiently and switching to renewable energy sources will make a significant contribution to achieving the Paris climate goals. Industrial companies play a vital role on the road to a low-emission economy. The Greiner Group obtains more than 83 percent of the energy it uses from electricity. We committed to using only renewable electricity by 2030, an important step in the energy transition. After all, as a company that processes plastics, we have highly energy-intensive processing and production processes. Nothing beats the sustainable use of energy.



Our energy consumption in focus

Management systems

Effective management systems provide a framework for controlling and optimizing operational processes. This is why we are pressing ahead with the expansion of management systems at production sites. Due to market, customer, and sector requirements, we stopped pursuing a strict hierarchy in 2022. The companies decide what management systems to implement at the individual locations based on their needs.

In the 2023 reporting year, 37 of our global production sites had an environmental management system certified to ISO 14001, while 13 production sites had an energy management system certified to ISO 50001. Management systems help establish systems and processes that are required to improve our environmental and energy performance (including environmental aspects), resource and energy efficiency, as well as energy use and consumption. The sites that are certified to ISO 14001 or 50001 have developed an environmental and energy policy, defined strategic and operational goals, and drawn up action plans to achieve these goals.

Energy consumption within the Greiner Group

Electricity accounts for the bulk of our energy consumption due to the production processes within the Greiner Group. After electricity, fuel consumption – primarily natural gas used to generate heat – accounts for the second-largest share of total energy use. Other fuels, such as the fuels used in the vehicle fleet and purchased heating and cooling energy, account for a relatively small share. Our fuel consumption derives almost exclusively from non-renewable sources.

Our total energy consumption in 2023 was 503 gigawatt hours, with Greiner Packaging having the highest energy consumption within the Greiner Group due to its more electricity-intensive production processes. Our total energy consumption was almost unchanged from the previous year, down three per cent. This reduction is due primarily to low electricity and fuel consumption.

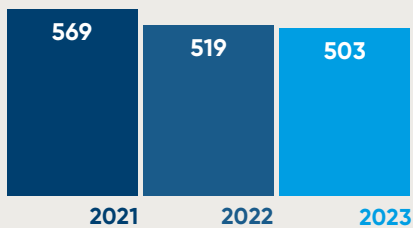
Production sites with certified environmental and energy management systems¹

Greiner Packaging	2021	2022	2023
ISO 14001	18	20	21
ISO 50001	4	7	8
NEVEON			
ISO 14001	17	15	15
ISO 50001	5	4	4
Greiner Bio-One			
ISO 14001	1	1	1
ISO 50001	1	1	1
Greiner total	46	48	50

¹ Changes compared to previous years are due to continued improvements in data quality.

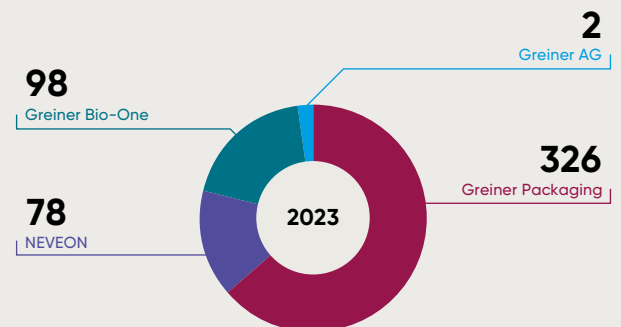
² purchased

Total energy consumption [in GWh]



	2021	2022	2023
Electricity consumption	427	427	418
Fuels	126	78	70
Heating energy	15	12	13
Cooling energy ²	1	1	2
Steam ²	–	0	0
Greiner total	569	519	503

Total energy consumption per division [in GWh]



Greiner total
503
2023

Expansion of photovoltaic equipment within the Greiner Group

In August 2022, we began installing photovoltaic systems at eight Greiner locations. Six new systems were connected to the grid in 2023. We use most of the generated electricity ourselves and export any excess to the public grid. The last system to go into operation was the one at NEVEON in Linz in June 2023. All photovoltaic systems generate around 2.7 gigawatt hours of electricity per year, equivalent to the consumption of around 900 households. For Greiner, this means that the new photovoltaic systems can provide about four percent of the electricity needed in Austria.



Photovoltaic systems at the Kremsmünster site

Electricity consumption

Greiner uses hardly any fossil fuels in the production process because it has few high-temperature processes. Almost all production systems are powered by electricity. That is why the share of electricity in total energy consumption is as high as it is. Using electricity efficiently and gradually reducing electricity consumption is not just a cost factor; it is also very important for sustainability.

We need various tools to achieve our goal of sourcing 100 percent of our electricity requirements from renewable sources by 2030. Firstly, we plan to expand our own electricity production using photovoltaic systems. Secondly, we will continue to rely on the purchase of Energy Attribute Certificates (EACs). In the past, we primarily purchased them under the electricity supply contract as part of a green power rate structure ("bundled"). Switching to centralized sourcing will allow us to purchase EACs independently of the electricity contract in the future ("unbundled"). This should make it easier to manage quality requirements for EACs (such as the age of the plant or the type of electricity production) for the entire Group and make the entire sourcing process more transparent. This also improves internal non-financial reporting as it makes it easier to assess when and how much renewable energy is purchased, for example, when electricity contracts are changed or switched during the year.

In addition to purchasing EACs, we continue to pursue the medium-term goal of entering into long-term electricity supply contracts directly with operators of solar or wind farms. These power purchase agreements (PPAs) will therefore play an important role in the new energy sourcing strategy. From a sustainability perspective, they have the potential to drive the expansion of renewable energy in the long term, even more so than other tools such as green power rate structures. Due to the complex structure and far-reaching financial consequences, we will rely in the long term on a combination of self-generated electricity, the purchase of bundled and unbundled EACs and power purchase agreements.

Our electricity consumption in 2023 was almost unchanged on the previous year, declining by two percent to 418 gigawatt hours. All three divisions experienced this slight decrease, which was highest (albeit still minor overall) at Greiner Bio-One. Measured by total electricity consumption, the share of electricity from renewable sources fell from 58 percent to 50 percent. This reduction is due to strategic considerations. In connection with our ESG promissory note loan, we have annually defined targets that will gradually bring us closer to our goal of obtaining 100 percent of our electricity from renewable sources by 2030. We achieved our obligation for 2023 according to these targets.

We continued to drive the expansion of photovoltaic systems in 2023. As a result, we were able to more than double the share of self-produced renewable electricity in total electricity consumption from 0.19 percent to 0.44 percent. Despite the installation of additional photovoltaic systems, our high electricity consumption means we still have a long way to go to reach our goal of 1.5 percent in 2025 and 2.5 percent by 2030. We will only be able to reach these goals by systematically expanding photovoltaic systems.

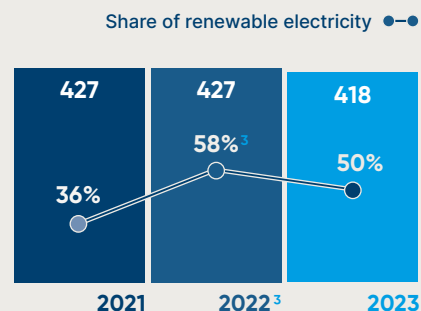
Group-wide energy sourcing:

Coordinated risk management approach

Previously, energy sourcing was handled locally and was coordinated individually by the various sites. In 2023, we decided to take a fresh look at the strategic direction of our energy sourcing and develop a more centralized approach. Group-wide energy sourcing is currently focused on the purchase of electricity as electricity accounts for the largest share. The transition grants us greater transparency and allows us to use a coordinated risk management approach. The newly defined principles will optimize the procurement process and synergies will be leveraged more efficiently throughout the Group. Both of these will help us to achieve the company's goals for energy procurement. The signing of the ESG promissory note loan in 2022 has created a commitment and financial motivation to implement a Group-wide switch to renewable electricity by 2030. This is made possible by centralized control, improved coordination, and more efficient monitoring.



Electricity consumption [in GWh] and share of renewable electricity [in %]



³ Slight differences in key figures in 2022 are due to improved data quality.

Energy consumption [in GWh]

	2021	2022	2023
Greiner Packaging	288	297	292
NEVEON	39	38	37
Greiner Bio-One	92	91	88
Greiner total	427	427	418

Share of renewable electricity [in %]

	2021	2022	2023
Greiner Packaging	28	64	58
NEVEON	47	33	21
Greiner Bio-One	52	51	32
Greiner total	36	58	50

Self-produced renewable electricity⁴ [in %]

	2021	2022	2023
Greiner Packaging	0.03	0.03	0.04
NEVEON	0.00	0.00	3.63
Greiner Bio-One	0.09	0.39	0.10
Greiner total	0.13	0.19	0.44

⁴ Own consumption

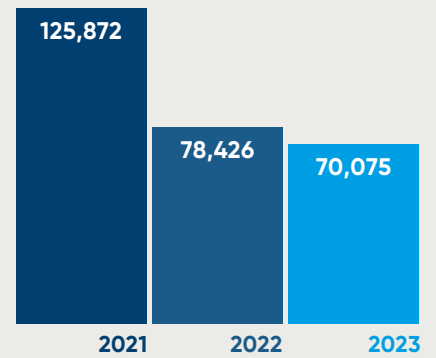
Fuel consumption

Fuel accounts for 14 percent of our total energy consumption and was 70 gigawatt hours in the reporting period. The fuels used are mainly natural gas (63 percent) for heat generation and are sourced almost exclusively from non-renewable sources (99.6 percent). Fossil fuels are also used primarily for the vehicle fleet, as well as for our internal logistics. Fuel for the fleet accounts for a relatively low share of total fuel consumption (27 percent).

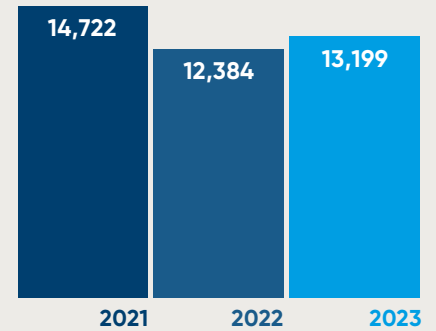
Heating and cooling energy and steam

Purchased and self-generated heating energy, as well as cooling energy and steam – makes up just three percent of our total energy consumption. Nevertheless, this figure increased year on year as a result of higher demand for heating and cooling energy during the reporting period. Steam is used exclusively for the chemical production of a product component at one of our company sites and has increased compared to 2023 due to new production that had not yet fully begun in 2022.

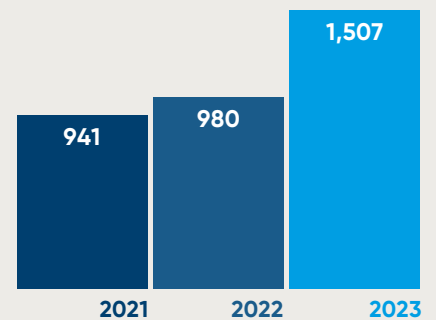
Fuel consumption [in MWh]



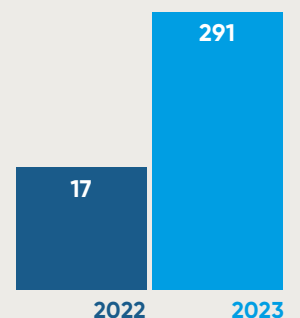
Heating energy [in MWh]



Cooling energy [in MWh]



Steam [in MWh]



Efficient energy management

Lowering energy consumption

As well as a gradual switch to an energy supply from renewable sources, greater energy efficiency and lower energy usage are powerful levers for reaching our climate protection targets. Our production, administration, and cutting plants implemented 83 energy-saving measures during the reporting period. Savings amounted to 5,033 megawatt hours in total (equivalent to around one percent of total energy consumption in 2022) or 877 tons of CO_{2e} (equivalent to around one percent of the total corrected Scope 1 and Scope 2 emissions in 2022) in 2023. This is down compared to 2022, when energy savings amounted to 6,555 megawatt hours or 1,025 tons of CO_{2e}.

Around 68 percent of the energy-saving measures implemented related to electricity. The remaining 32 percent of measures related to savings in the energy sources of heating, gas, and heating oil. Carbon savings were calculated using the DEFRA and MLC databases (previously GaBi) and electricity emissions determined based on the site figures also used in Scope 2 calculations.

The implemented optimization measures include various activities relating to buildings and infrastructure and production processes.

Significant action in the field of buildings and building infrastructure:

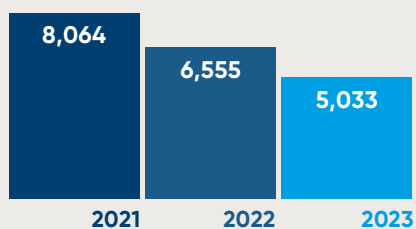
- Adjusting and reducing room temperatures in administration and production areas
- Optimizing ventilation and heat supply systems by increasing automation, using residual heat, and upgrading existing cooling systems
- Optimizing and replacing of lighting systems
- Reducing compressed air consumption and improving leakage management

Significant action in the field of production processes:

- Purchasing new equipment and machinery
- Increasing process efficiency and using automated shut-down processes
- Optimizing engines and drives
- Improved leakage management

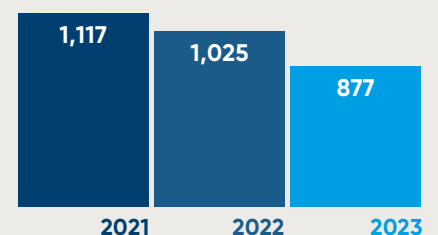
⁵ The difference between the total and the total of the three divisions is due to Greiner AG not being reported separately in the two images.

Energy savings⁵ [in MWh]



	2021	2022	2023
Greiner Packaging	6,042	3,329	2,569
NEVEON	838	1,883	1,673
Greiner Bio-One	1,184	1,278	785
Greiner total	8,064	6,555	5,033

Energy savings⁵ [in t CO_{2e}]



	2021	2022	2023
Greiner Packaging	464	501	314
NEVEON	537	347	435
Greiner Bio-One	116	177	128
Greiner total	1,117	1,025	877

Energy intensity

We show the change in energy use by energy intensity, a metric we have defined as total energy consumption per revenue (in kWh per 1,000 euros) since 2018. We had set ourselves the goal of reducing energy intensity by 20 percent by 2030 (base year 2018). Thanks to a wide range of measures, we were able to reach it as early as 2022. At the same time, however, it has also become clear that various factors, such as rising energy prices and inflation, have had a disproportionate impact on sales revenue and that the key figure in relation to energy savings does not have the desired significance. In view of this, we restarted the process of defining key figures in 2023.

As a result, each division developed a specific key figure for energy intensity in 2023 in order to obtain a more reliable and resilient metric. These specific intensity indicators result from the different requirements in the production processes of each division. There is no universally "correct" key figure as numerous factors have an influence on energy intensity. Such factors include the product portfolio, capacity utilization, base load, changes to the product portfolio, and tests of new innovations. This is why three individual energy intensity targets were set with target values for 2030. These targets are also part of Greiner's Blue Plan sustainability strategy and replace the original group wide energy intensity target.

Greiner Packaging calculates energy intensity as total electricity consumption per kilogram of plastics. This calculation relates exclusively to products deemed to be in perfect condition that are tracked in the ERP systems. There is good reason to focus on electricity as the only energy source since our electricity-intensive production processes require electricity to be the primary energy source. Its goal for 2030 is a reduction of 7.5 percent compared to the base year 2021.

NEVEON defines energy intensity as total energy consumption in relation to gross margin, which applies to all locations and includes all energy sources. Its goal for 2030 is a reduction of 15 percent compared to the base year 2021.

To measure energy intensity, Greiner Bio-One uses a key figure that measures electricity and gas consumption in relation to raw materials used. Its goal for 2030 is a reduction of ten percent compared to the base year 2018.

An annual review is carried out to monitor progress in achieving the new division-specific energy intensity goals. The results of this review are communicated in the annual report to ensure that the defined goals are being met accordingly.

Specific energy intensity targets

	Greiner Packaging	NEVEON	Greiner Bio-One
KPI	Electricity consumption (kWh)/ quantity of finished products (kg)	Energy consumption / gross margin (EUR)	Electricity and gas consumption (kWh)/ plastics used (kg)
Target in 2023	-7.5%	-15%	-10%
Base year	2021	2021	2018

Outlook: Energy

As electricity accounts for the largest share of our energy use, our primary goal is to source 100 percent of our electricity from renewable sources by 2030. As well as supporting the Scope 2 goals of our science-based targets, this will also help us achieve our green energy roadmap established as part of

the ESG promissory note loan. We plan to meet these targets by managing the largest electricity supply contracts centrally and by implementing a Group-wide electricity decarbonization strategy. We will also evaluate the scope for further photovoltaic projects – in particular outside Austria. The more informative energy intensity targets should also help us establish effective measures for reducing our energy requirements.



TCFD-relevant information

The increase in extreme weather events, such as storms, heavy rains, droughts and heat waves, illustrates the immediate threat posed by climate change. It has an impact not only on people but also on companies' business processes. For this reason, we identify and assess climate risks and opportunities for our company and for our upstream and downstream value chain. Because nothing beats measures that promote resilience. These lay the foundation for environmentally and economically sustainable business development.

Increased frequency of extreme weather events can adversely affect our operations, cause property damage, and harm our business performance. Also, capital market access will become increasingly difficult for companies that cannot manage the risks associated with the climate crisis. However, a systematic analysis of climate scenarios and associated risks also provides companies with an opportunity to take a critical look at the risks and opportunities. It refocuses our attention, redirects action and financial flows to new fields and, in the end, leads to innovations that not only make the companies more resilient in structural terms, but also more successful in their business activities.

In addition to the introduction of ambitious climate and environment targets and the continuous improvement of Group-wide data management, the reporting system must also be expanded further. To accomplish this, we publish climate-related information in accordance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD). The climate change-related risks (and opportunities) were identified and assessed as part of the ESG risk analysis.

→ Read more under: [Governance/Business conduct/Risk management](#)

The table below shows where the report contains relevant information on the four subject areas as set out by the TCFD. In 2023, we were not able to implement the scenario analyses

recommended by the TCFD across the Group in line with the standards. This is planned for 2024.

Subject area	Detailed TCFD-relevant Information	Reference
Responsibilities and governance	Governance of climate-related risks and opportunities	pp 64, 116, 219
	Management role in the assessment and governance of climate-related risks and opportunities	pp 64, 116, 219
Strategy	Climate-related risks and opportunities (short, medium, and long term)	p 117
	Impact of climate-related risks and opportunities on business, strategy, and financial planning	p 117
	Resilience of the corporate strategy considering various climate-related scenarios, including a scenario featuring a temperature increase of 2°C or below	planned for 2024
Climate-related risk management	Process description for identifying and assessing climate-related risks	p 118
	Management of climate-related risks	p 118
	Linking the collection, assessment, and management of climate-related risks with classic business risk management	p 118
Key figures and targets	Metrics used to assess climate-related risks and opportunities	p 121
	Scope 1, Scope 2 and (where applicable) Scope 3 emissions and the associated risks	pp 97, 121
	Metrics used to measure the impact of climate-related risks and opportunities in relation to the associated targets	pp 121, 219

Responsibilities and governance

Responsibility for climate-related issues lies primarily with the Chief Executive Officer (CEO) of Greiner AG. Together with the entire Executive Board, the CEO is responsible for sustainability matters and thus for all climate-related decisions. The Executive Board discusses potential climate-related opportunities and risks and initiates further action as necessary. Greiner thus ensures that sustainability aspects are managed in a focused manner and taken into account in forward-looking decisions. The Executive Board then reports to the Supervisory Board, which is thereby kept informed of material current developments. The Audit Committee is also informed on appropriate issues as needed. At the highest divisional level, the division heads are responsible for the strategic direction and management of the sustainability agenda and report to the entire Executive Board. The division-wide specialist departments in turn report directly to the divisional heads. At the site level, the issues are the responsibility of the respective managing

directors and local departments and experts. They are responsible for supporting and implementing Group-wide targets at a local level through targeted measures. Depending on the main topic in question, there are also high-level departments that are dedicated to the topic of circular economy, among others, and specifically build up competence and expertise for the entire Group.

On the product side, responsibility lies with the respective divisions and their relevant departments, especially the research and innovation departments, which drive both product inventions and product enhancements. We work closely with customers, partners, suppliers, and research institutions to develop innovative products and solutions in response to market needs and emerging plastics and foam processing requirements. The individual divisions are also in regular contact so that they can exploit synergies and jointly address overarching issues.

Our Sustainability Department is responsible for the Group-wide coordination of all sustainability agendas and the related internal and external communication and representation. Since November 2022, the leadership of the Sustainability Department has been shared by two Co-Heads of Sustainability, who divide their responsibilities for the area by topic. They act as Group-wide coordinators and, as such, as interfaces between the decision-makers in the divisions and other relevant high-level areas such as Risk and Compliance. In the specialist areas, the area managers bear responsibility and drive specific matters according to their skills. The Co-Heads of Sustainability report to the Vice President People & Sustainability, who in turn reports directly to the Greiner CEO. This structure makes it possible for the Executive Board to obtain targeted information at any time with regard to the various sustainability agendas and for the divisions and specialist departments to receive the best possible support for jointly pursuing Group-wide goals and requirements. At the divisional level, the sustainability coordinators have responsibility for sustainability matters and, therefore, for climate issues. The coordinators maintain close contact with the divisional heads, the specialist departments, and the Group-wide Sustainability Department. The Sustainability Council is the chief information and decision-making body for managing ESG-related impacts, risks, and opportunities. It meets on a quarterly basis under the CEO's leadership. These meetings are attended by the divisional heads, the sustainability coordinators, the spokespeople of the relevant working groups, and the Sustainability Department itself. Depending on the focus and topics of a meeting, subject matter experts are also called in as needed.

→ Read more under: [Sustainability management / Sustainability management structure](#)

Our strategy and climate-related risks

Our Blue Plan sustainability strategy is reviewed on an ongoing basis to ensure that it remains up to date and, if necessary, is adapted or expanded. The topics covered by the sustainability strategy and the associated targets are also taken into account in the Group Strategy, as well as in the strategic alignment of the individual divisions and specialist departments, such as Research and Innovation, Purchasing, and Human Resources.

For example, sustainability aspects are integrated into the research and development processes of product development, while production processes are optimized. For us, a climate-friendly energy mix is important. We also consider sustainability when evaluating potential future markets and aligning our business model.

We assess climate-related risks and opportunities and their impact on our company on an annual basis to obtain forward-looking information on the effects of climate change and incorporate this information into our work. Potential climate-related risks could include:

- **Energy and emissions:** Changes in the energy market due to climate change can lead to rising costs for energy, energy infrastructure, and energy certificates. In addition, climate change can increase the energy needed for cooling in the summer months, which can create more emissions. In addition, rising prices for emission allowances can lead to higher costs.
- **Materials:** The risk that the use of fossil raw materials will become increasingly limited or expensive or that the use of secondary materials will become mandatory and that companies will therefore have to secure access to alternative raw materials made from renewable sources, recycled input materials, or secondary raw materials. Regulatory requirements in the packaging, plastics, and foam processing industries are tightening, as are market-specific requirements in our sales markets. This risk can become a market opportunity for innovative pioneers.
- **Future viability (transformation):** The failure to execute future-oriented goals properly or at all can cause reputational damage and associated financial consequences. A company can also lose financial strength if it fails to adapt its business model to global trends in a timely manner.
- **Physical risks:** The risk of production losses at sites affected by flooding (due to increasing heavy rainfall events or a gradual rise in sea level), extreme drought, or population migration due to excessively high temperatures, drought, et cetera.

Current and future areas of action

Greiner's greenhouse gas emissions represent a material environmental impact, which is why our sustainability agendas focus on decarbonization and the circular economy. Over 90 percent of our emissions fall within Scope 3, which is closely linked to the materials we source and the production conditions of our suppliers. In addition to strengthening our commitment to suppliers, we are paying special attention to upstream and downstream logistics and the disposal of our products after use. It is essential to take targeted measures to prevent and dispose of waste and to use materials efficiently. We are simultaneously increasing our focus on processing secondary raw materials, which will further reduce our emissions.

a. Energy and emissions

Increasing the amount of electricity we produce from renewable sources, reducing the amount of fossil fuel-based electricity we purchase to zero percent by 2030, optimizing energy efficiency in production, developing measures to achieve our science-based targets, developing a supplier engagement strategy

b. Aspects of the circular economy

Selecting raw materials according to regulatory and market requirements, using materials efficiently, increasing the use of secondary raw materials, analyzing recycling potential, using alternative materials, developing products to optimize their recyclability at the end of their useful life, collaborations, gradually improving waste management (increasing the share of recycled waste and reducing landfill waste), using and consuming water sparingly and efficiently, closing loops to become a fully circular company by 2030

c. Alignment of the business model

Anchoring sustainability aspects in the corporate strategy as an essential higher-level tool in order to successfully drive change, address global trends and requirements, and ensure the continued success of the business model and therefore of the company

Climate-related risk management

As a plastics and foam processor, our company is exposed to various risks and opportunities related to climate change. Capturing and classifying them systematically is essential for mitigating risks and possibly even turning them into opportunities. Our Group-wide Risk Department uses a structured approach to progressively expand the risk survey and implement it across the Group. That is why we expanded our traditional risk survey to include ESG risks in the 2023 reporting year. We also continued to develop our risk management system with external support. We take into account all relevant activities and developments across our entire value chain, from the supply chain through to production, waste disposal, and recycling.

Identifying non-financial risks is a material component of sustainability management. This is in addition to implementing the sustainability strategy and various activities to advance the strategic goals. This process was carried out for the first time across the Group in 2023 by the Risk Department with the Sustainability Department and the involvement of the Executive Board. The integration of ESG risks into risk management, which started as a pilot project in 2023, will be rolled out across the Group in the coming years. In addition to the Group-wide risk process, we also document local and topic-specific risks and opportunities as part of our various management systems (such as ISO 14001 and ISO 50001) at the sites, where the results are incorporated into the local processes, activities, and objectives.

→ Read more under: [Governance/Business conduct/Risk management](#)

Developments in recent years have shown that climate-related risks and opportunities in particular are becoming increasingly important, but that they have an impact at different levels and therefore on various areas of the company. The impact of climate-related risks and opportunities on a company is not usually apparent in the short term but rather over the medium to long term. This makes it all the more important for us to identify critical factors in time to align our strategic decisions and activities.

Physical risks

Physical risks are the direct effects of climate change. A distinction is made between:

- **Direct physical risks:** These can include acute events (storms and heavy rain events) and chronic changes (sea level rise). The consequences for companies can range from storm damage to buildings and the temporary disruption of global supply chains through to the loss of coastal locations.
- **Indirect physical risks:** These can include losses in production due to a shortage of water in water-stressed areas as a result of prolonged dry periods or heat waves. Indirect physical risks can also arise in connection with an increase in required investments in facility management. This can occur, for example, when rising outside temperatures require technical and structural measures to cool buildings.

As it stands, only a few of our sites are currently affected by physical risks resulting from climate change. With the help of an external partner, we carried out an initial evaluation of physical risks at a site level back in 2021. This analysis was updated in 2022 and expanded to include all of our sites across the world. The majority of production sites are located

in regions where physical risks, such as water shortages or extreme weather events, currently play a minor role. However, as this may change in the coming years, physical risks are continuously assessed in terms of their probability of occurrence and potential impact. In the next few years, we also intend to conduct the climate scenario analysis required by the TCFD.

Transition risks (transformation risks, regulatory risks)

In addition to physical risks, there are also climate-related transition risks that could affect business activities in the short to medium term. Transition risks arise primarily as a result of regulatory and political requirements such as the introduction of a carbon tax, the expansion and tightening of emissions trading, the Packaging and Packaging Waste Regulation (PPWR), or the ban on single-use solutions. However, they also arise as a result of market-specific and socially motivated developments related to decarbonization and the circular economy. This leads to rising costs for companies and changing expectations among customers. In terms of plastics and foam, this primarily relates to national and European legislation where the focus is usually on the use of secondary raw materials and the recyclability of products.



Adjusting to these effects may entail extensive investments or may also have an impact on corporate strategy and, depending on the circumstances, on future mergers and acquisitions. Related to this is the increasing orientation of the financial market toward sustainability, which must be taken into account. We have already set the right course for the future by signing a

sustainable ESG promissory note loan in 2022 and verifying our science-based targets in 2023.

The following table lists the transition risks identified in the course of the ESG risk assessment.

Overview of the main climate-related risks and opportunities

Risk	Countermeasures	Opportunities
Rising costs for energy, energy infrastructure, and energy certificates	Projects to improve efficiency and effectiveness, development of a Group-wide purchasing strategy for renewable electricity, increase in the proportion of self-generated electricity, awareness-raising at the sites in combination with clear targets	Cost benefits and image boost from driving decarbonization as well as protecting the environment and climate
Limited availability and rising costs of secondary or bio-based raw materials	Knowledge development, product design, collaborations, research, and development measures focusing on materials	Competitive and cost advantage through comprehensive circular economy
Insufficient consideration of ESG aspects in the innovation strategy and product development (inside-out & outside-in risk)	Objectives in product sustainability, targeted research and development measures, product design	Promotion of a comprehensive circular economy, decarbonization, environmental and climate protection, image boost, opening up of new markets
Financial risks or loss of market share due to non-compliance with new legal or customer requirements for existing products, particularly in connection with the PPWR, EU directives and EU Taxonomy	Compliance with legal requirements, development of internal guidelines to meet requirements, targeted research and development measures, product design	Promotion of a comprehensive circular economy, decarbonization, environmental and climate protection, image boost, opening up of new markets
Limited access to outside financing due to lack of ESG considerations in Greiner's strategy and business model	Targeted measures to achieve the Group-wide targets, drive circular economy and decarbonization efforts, implement the requirements of the EU Taxonomy, awareness-raising and control	Environmental and climate protection, image boost, easier access to outside financing
Loss of image and customers due to stagnation in the achievement of ESG targets and lack of governance structure	Group-wide monitoring of target achievement, establishment of a governance structure and clear assignment of responsibilities, implementation of regular meetings, management of target achievement through targeted mechanisms such as incentives and target agreements, awareness-raising and sensitization	Environmental and climate protection, promotion of diversity, image boost, opening up of new markets, retaining and attracting employees

Targets and indicators

Having an overview of our material ESG risks and opportunities is not enough to transform Greiner into a viable, sustainable company and create a positive impact. What is needed is intelligent risk management and the creation of the right conditions to seize opportunities.

The measures and targets set in this context can be used in relation to the adaptation to climate changes already prevalent (climate change adaptation) or to the longer-term avoidance of climate-related consequences through the reduction of greenhouse gas emissions (climate change mitigation).

Overview of our climate focus areas:

- **100-percent renewable electricity by 2030**
Our major climate goal is to source all of the electricity we purchase from sustainable sources by 2030. To that end, we have created a roadmap that defines and tracks the annual steps. With the help of the Group-wide data collection software, we gather information at our sites each year and can use this to evaluate target achievement and plan further steps as needed.
- **Increase in the share of self-produced renewable electricity to 2.5 percent by 2030**
We have set ourselves the goal of continuously increasing our share of self-produced renewable electricity and, where technically feasible, installing the photovoltaic systems. In order to do this, we will need to conduct feasibility studies to determine not only the potential but also the necessary investment capital. At the same time, we are working to reduce our energy consumption.
- **Limiting global warming to 1.5 °C**
We want to slash our absolute emissions. By gradually increasing the share of purchased and self-produced renewable electricity, we are moving closer to our goal of cutting 60 percent of our Scope 1 and Scope 2 emissions by 2023 compared to the base year of 2021. To reach our conservation goals, we need to identify possible supplementary activities such as PPAs (power purchase agreements), internal CO₂ pricing, the conversion of the vehicle fleet, and making changes to mobility. Our emissions in the value chain, both upstream and downstream, are an important source of leverage. Our Scope 3

emissions account for more than 90 percent of our emissions, which is why we are committed to reducing our absolute Scope 3 emissions in relevant categories (fuel- and energy-related activities, upstream and downstream transportation and distribution, as well as the end-of-life treatment of products sold) by 25 percent by 2030.

→ **Supplier involvement**

We need to work closely with our suppliers to reduce emissions upstream in the supply chain. That is why we have set a goal for 80 percent of our suppliers to have science-based targets by 2027, as measured by the emissions from purchased goods and services. By working constructively with our suppliers, we can not only transparently monitor and reduce these emissions but also encourage the development of sustainable supply chains, accelerating the transition to green business practices. This is why we encourage our suppliers to report their sustainability information to us through the CDP or EcoVadis systems.

→ **Circular economy**

We want to be a fully circular company by 2030. Together with our partners, we are working step by step toward our vision of optimizing and closing loops by disclosing and actively improving the environmental performance of our products, increasing the use of secondary materials, employing smart waste management, and protecting water resources. The focus of our efforts is primarily on material-specific measures and activities in terms of recycling, reusability, and even the use of secondary raw materials. In relation to materials in particular, there are many different approaches that we want to evaluate with regard to technical and economic possibilities. For example, we want to analyze the mechanical or chemical recycling of materials and the use of bio-based raw materials and find out under what circumstances this can reduce the impact on the climate. At this point, we would like to mention our participation in high-level committees, where we work with other stakeholders to find answers to important questions. By working closely with customers and other stakeholders – for example, by integrating customer feedback into our innovation processes and co-developing products and solutions – we are able to identify future market trends and opportunities and drive innovation.



Management approach Resource use & circular economy

Our goal is to evolve from a linear economic system into a sustainable circular economy. To do this, we enshrined the circular economy both in the Group's strategy and in the divisions' strategies. We therefore acquired a recycling plant in Serbia in 2022 and set yet another milestone in our circular economy trajectory: the first-ever use of r-PET produced in-house. We pursue multi-level approaches to closing material loops. In addition to increasing our share of secondary materials, we are focusing on improving resource efficiency and extending the product life cycle by developing reusable packaging.

In recent years, we have also been working hard on developing products made from sustainable plastics. All these activities reduce waste volumes and the negative environmental impact of waste. In addition, design for recycling and the definition of eco-design requirements in the area of sustainable product design are of essential importance. We use product carbon footprints and life-cycle assessments to drill down deeper into our products' actual and potential environmental impact and then incorporate these findings into our product-development processes.

Our impact in the value chain:

○ upstream processes ○ own processes ○ downstream processes

Actual & potential impacts

Positive

- Closing material loops conserves natural resources
- The development of reusable products reduces the environmental impact at the end of the product's life cycle
- Increasing resource efficiency and using a larger proportion of secondary materials reduces the use of primary raw materials
- Using sustainable plastics reduces waste and CO₂ emissions
- Innovations in product development enable the development of more sustainable products
- Cooperation and cross-sector collaboration help to build and share knowledge

Negative

- Dependencies on collection systems and infrastructure make it difficult to close material loops
- Increasing the share of secondary materials can impair quality in certain plastic and foam products
- The use of composite plastics often makes collection, separation and processing technically challenging and impairs recyclability and recycling efficiency
- Strict regulatory requirements make it difficult to recycle products
- The lack of uniform international standards creates different approaches along the value chain
- Recycling and downstream processing can be more energy intensive than conventional production processes, which can cause CO₂ emissions and other environmental impacts depending on the energy source.

Implemented measures & policies

- We made the circular economy an integral part of the strategic alignments of the divisions and the Greiner Group
- We purchased a recycling plant in Serbia and use self-produced r-PET in Greiner products
- We developed a "design for recycling" strategy at Greiner Packaging
- We broadened in-house knowledge of sustainable product development through the development and implementation of training courses
- We developed tools to calculate product carbon footprints and life cycle assessments
- Increasing the share of secondary materials or using bio-based plastics generates new product innovations
- We improved data quality in the collection of waste information by developing Group-wide, standardized definitions of waste streams and giving specialist presentations
- We developed and defined a Group-wide approach to regulate the procedure for classifying water risk or water stress at production sites

Targets

- Increase in secondary materials¹
- Greiner Packaging: 100% of plastic packaging is reusable, recyclable or compostable by 2025
- Greiner Packaging: 10% sustainable plastics² by 2025
- 100% FSC-certified or equivalent paper for secondary and tertiary packaging by 2025
- We calculated product carbon footprints for all material product groups until 2024
- We carried out life cycle analysis for all material product groups until 2025
- 0 t waste sent to landfill in Europe by 2025 and world-wide by 2030
- 75% of waste recycled by 2030
- Analysis of potential water savings in water-stressed areas by 2023
- Develop a Water Policy for all Greiner sites by 2023

Performance & target achievement

- See [Overview of 2023 sustainability performance](#)

¹ Share of secondary materials (raw materials, consumables, supplies, and packaging) used in total material consumption ² Proportion of sustainable plastic raw materials used (recycled or bio-based) in all plastic raw materials used.

Materials



We are particularly committed to the efficient use of our resources and rigorously advocate for the progressive implementation of closed material loops. This not only cuts costs but also reduces negative impacts on people and the environment along the entire value chain. Our primary goal is to promote the use of sustainable raw materials and continuously increase the share of secondary materials. Nothing will beat sustainable materials in the future.

An overview of our materials

As defined in our Blue Plan sustainability strategy, we have set ourselves the goal of becoming a completely circular company. This is why key elements of our business practice are the efficient use of materials, the ongoing optimization of our production processes, and the use of the latest production technologies.

About 70 percent of our total purchasing volume comprises materials and raw materials. In addition to raw materials, we also purchase semi-finished and finished products. We generally separate these into five material groups. The most important material groups are plastics¹, chemicals, and fibers. Based on the purchasing volume in euros, plastics are still the largest material group among the purchased raw materials at 53 percent in 2023. Chemicals make up 37 percent and fibers six percent of total raw material purchases.

The use of chemicals is subject to strict regulations. This includes, for example, the REACH Regulation, which governs the registration, evaluation, authorization, and restriction of chemicals. Since the protection of human health is our top priority, we use chemicals only in strict compliance with the applicable regulations. In Austria, we deploy ionized radiation to sterilize our medical products. This is generated either by electron

accelerators or, for high-density products, by radioactive decay of cobalt-60. The use of ionizing radiation in Austria is regulated by the Radiation Protection Act and the Radiation Protection Regulation, with the authorities ensuring compliance with these regulations through regular inspections.

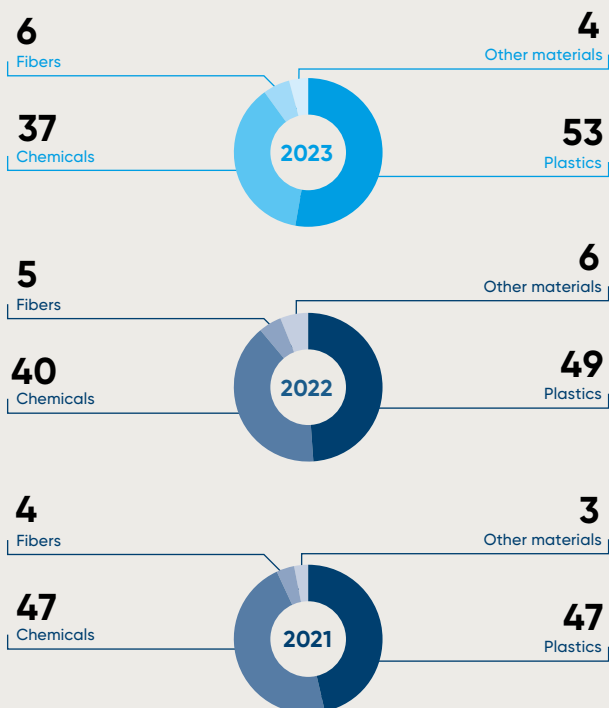
Our total materials include all raw materials, supplies, operating materials, semi-finished products, and packaging. Our total material consumption fell from 587,829 tons in 2022 to 567,786 tons in the reporting period, a decrease of 3.4 percent.

The share of renewable materials² in total material consumption declined to 13 percent last year. In 2022, this share was 22 percent. The renewable materials that we use include paper, cardboard, natural cork, and wood, for example. These materials are primarily used as packaging materials but also as raw materials, for example, for decorating K3® cups.

Changes compared to the previous year are particularly striking when considering the table below and the material quantities used in our divisions. This is true both of renewable and non-renewable materials. We are working hard on improving current material data collection and calculation processes. For this reason, changes compared to previous year figures are primarily the result of the ever-improving quality of underlying calculations.

Purchasing volume by material group

[in %, based on raw material purchases in euros]



¹ The plastics purchasing data includes granulates and films.

² Renewable materials are materials derived from abundant resources that can be rapidly renewed through ecological cycles or agricultural processes so that the services provided by those resources or other related resources are not at risk and are available for the next generation.

Materials used [in t]

	2021	2022	2023
Greiner total			
Renewable materials	38,175	128,212	75,965
Non-renewable materials	367,397	459,617	491,821
Total	405,572	587,829	567,786
Greiner Packaging			
Renewable materials	31,438	115,575	31,523
Non-renewable materials	177,278	254,802	225,292
Total	208,716	370,377	256,815
NEVEON			
Renewable materials	2,069	9,440	5,772
Non-renewable materials	155,895	163,369	191,743
Total	157,964	172,809	197,515
Greiner Bio-One			
Renewable materials	4,668	3,197	38,669
Non-renewable materials	34,224	41,446	74,785
Total	38,891	44,643	113,454

The total material consumption includes all purchased raw materials, supplies, and packaging directly used or consumed in production. Changes compared to previous years are due to continued improvements in data quality.

Secondary materials

The reuse of secondary materials reduces the need for primary raw materials, which leads to the conservation of natural resources and replaces the often more energy-intensive extraction of new raw materials. In addition, returning secondary materials to the production processes can reduce the amount of waste and the environmental impact associated with each disposal method (landfill, incineration).

We aim to steadily increase the proportion of secondary materials used. The decline from eleven percent in 2022 to four percent in 2023 is due to an increase in the quality of data collection and calculation.

Challenges and milestones in the use of recycled materials

The year of 2023 was characterized by high inflation, rising interest, and energy costs as well as shortages of primary and secondary materials. To strengthen the company's resilience, the Greiner Group's first recycling plant was acquired in Serbia back in 2022. It is essential to ensure that access to secondary materials is guaranteed both in the short and long term. We achieved another milestone in this respect last year: For the first time ever, we used r-PET flakes from our recycling plant in

Share of secondary materials in total material consumption [in %]

	2021	2022	2023
Greiner Packaging	10	15	7
NEVEON	8	4	0
Greiner Bio-One	4	4	3
Greiner total	9	11	4

To calculate the proportion of secondary materials, all secondary materials used (raw materials, supplies and operating materials, and packaging) are compared against all of the materials used.

Greiner Packaging's production. We are determined to further expand the use of internally produced r-PET in our products and will therefore continue to resolutely pursue this visionary path.

The use of recycled materials varies within our different divisions and product categories. At Greiner Bio-One, its use is



The r-PET flakes from our recycling plant in Serbia were used in Greiner Packaging's production for the first time in 2023.

currently limited due to the strict requirements in the medical industry. We are working on this issue in pilot projects such as the "Rack Back Initiative" for the reuse and recycling of pipette tip racks. Where standards permit, such as in packaging materials, Greiner Bio-One uses recycled materials and already obtains 85 percent of its secondary and tertiary packaging from FSC or equivalent certified paper sources. At NEVEON, we are also actively looking for ways to increase the share of secondary materials. For example, NEVEON is collaborating with BASF on solutions in chemical recycling. In 2023, we successfully produced high-quality mattresses with a recycled content of 80 percent in the polyol component.

→ Read more under: [Our Performance / Divisions](#)

Greiner Packaging is navigating a changing regulatory environment. There are strict product safety rules for packaging that come into contact with food. Meanwhile, the industry is undergoing radical change since the revision of the EU's Packaging and Packaging Waste Directive will set new standards. This directive, which is currently being developed at the EU level and is expected to be published as a new regulation, aims to reduce the amount of packaging waste and defines binding requirements for the design of packaging as well as recycling targets. Greiner Packaging sees the recyclability of a product as an integral part of the design process, enabling it to meet changing legal requirements. This is why Greiner Packaging has set the goal of making all plastic packaging reusable, recyclable, or compostable by 2025. According to

the definition of the Ellen MacArthur Foundation Global Commitment, 84.6 percent of our plastic packaging was already designed for recycling in 2022. The share of plastic packaging that is actually recyclable is 8.2 percent³. Moreover, we have set ourselves the goal of sourcing ten percent of our plastic materials from sustainable plastics by 2025⁴. According to the definition of the Ellen MacArthur Foundation Global Commitment, three percent of the plastic materials we used came from post-consumer recycled materials in 2022⁵.

We will need to make progress in the development of plastic waste sorting if we want to obtain high-quality and clearly separated recycled materials. The heterogeneous development of the infrastructure in various countries poses significant challenges for global companies like us. This means that we can only recycle effectively if companies along the entire value chain work together and invest jointly in modernizing the circular economy.

→ Read more under: [Sustainability management / Memberships and initiatives](#)

³ The figures for 2023 were not yet available at the editorial deadline. The calculation method used was changed in 2020. Up until that point, we had been using a local approach (i.e. calculating on a country-by-country basis). Since 2020, we have been using a global approach where all of our packaging is measured using the threshold values for a recycling rate of 30 percent per 400 million people. Based on this methodology, there is no sufficient recycling infrastructure available for PP rigids, PS rigids and PET non-bottles in Europe. In comparison with 2020 (34 percent) therefore, the logic behind the calculation has changed. ⁴ Proportion of sustainable plastic raw materials used (recycled or bio-based) in all plastic raw materials used. ⁵ The figures for 2023 were not yet available at the editorial deadline.

Use of renewable raw materials

Alternatives to conventional plastics and foams can be found in bio-based variants. Even with bio-based raw materials, however, it is crucial to analyze the environmental impact comprehensively and carefully. For food safety reasons, only input materials should be used that neither compete with foodstuffs nor could have a negative impact on the environment or society due to their cultivation method. Compared to conventional fossil-based plastics, which release more climate-impacting CO₂, the environmental footprint of bio-based plastics is often reflected in an increased potential for acidification and eutrophication as well as the amount of land required. These effects are attributable to the agricultural production of raw materials. With the help of product carbon footprints (PCFs) and life cycle assessments (LCAs), we can estimate the potential and actual environmental impact of our products over their entire life cycle.

→ Read more under: [Environment / Resource use & circular economy / Products](#)

An example of the use of renewable resources can be seen at NEVEON where castor oil is used as a bio-based raw material in the production of the EMC Verde line of cold-foam mattresses. Castor oil is not used as a foodstuff, making it a justifiable raw material both ethically and in terms of food safety. Greiner Packaging is also constantly advancing the use of sustainable plastics. For example, by integrating the Borneables™ portfolio from Borealis, Greiner Packaging has introduced renewable resources into the production of food cups made of polypropylene (PP) with in-mold labeling (IML) as the decoration technology. Our subsidiary Greiner Zeroplast is also working intensively on the development of sustainable alternative plastics for industrial injection-molding series production.

Greiner Packaging: Using renewable raw materials for food packaging

By integrating the Borneables™ portfolio from Borealis, Greiner Packaging has for the first time introduced renewable resources into the production of food cups made of polypropylene (PP) with in-mold labeling (IML) as the decoration technology. Borneables materials offer the same properties as virgin polyolefin but their product carbon footprint is up to 120 percent lower than fossil fuel-based PP. The ISCC+ certification of numerous Greiner Packaging sites ensures that this IML cup can be produced at various Greiner Packaging sites.

With Borealis's Borneables™ product, Greiner Packaging has integrated renewable resources into its food cups. This reduces the product carbon footprint by up to 120 percent.



Paper from certified forests

We mainly use paper in the form of cardboard boxes, trays, interlayers in cardboard boxes and on pallets, labels, or paper adhesive tape for the packaging of our products. Paper consumption accounted for 21 percent of total material consumption in both 2023 and 2022.

Last year, we took a big step toward our goal of sourcing all of our secondary and tertiary packaging paper from FSC or equivalent certified paper sources by 2025. In 2023, 76 percent of secondary and tertiary packaging used came from forestry-certified paper sources. We will continue to work as hard as we have been doing and so are convinced that we will reach the goal we have set for ourselves.

Paper for secondary and tertiary packaging from certified forestry

[in %]

Greiner total
76
2023

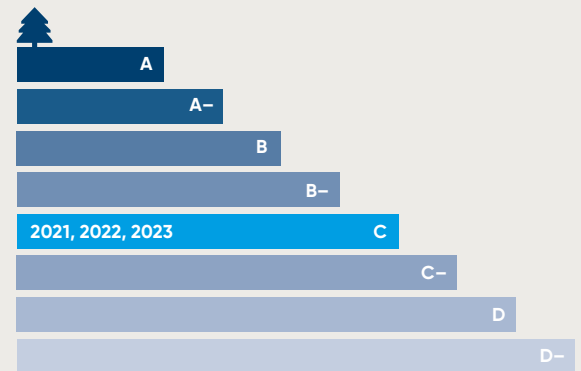


- Greiner Packaging
- NEVEON
- Greiner Bio-One

CDP forests score

We are rated annually by the CDP in the categories of climate, water, and forests. In the interest of maximum transparency, we have also made the CDP forests score publicly available on the CDP Disclosure Platform since 2022. We received a C score in 2023, as in the previous two years. We primarily process plastics from the petrochemical industry. We only process small amounts of rubber, leather, and textiles and do not process soy, natural rubber, or seeds. For this reason, certain topics, such as dispossession and evictions, are of only minor relevance to Greiner.

Our CDP forests score



Outlook: Materials

The acquisition of the Greiner recycling plant and the use of r-PET from our plant in Greiner products means that we have taken more successful steps in the secondary materials domain. We will continue to focus on driving the integration of intra-Group recycling options in the future. The EU-wide Packaging and Packaging Waste Regulation will present us and the entire packaging industry with new challenges over the next few years. As a company, we are following the developments of this packaging regulation very closely and are already setting ourselves up to act in accordance with the future requirements. We will also actively pursue our ambitions in the use of sustainable materials in product innovations and collaborations along the value chain.

Products



The demands on our products may be diverse and differ by sector, but nothing beats our common goal: We want to make our products as sustainable as possible. This includes reducing the use of materials, promoting reusable solutions, integrating recyclability, using sustainable plastics, and increasing the use of secondary materials. After all, there is no alternative to creating a circular economy.

Product quality is paramount

We see our products everywhere in our daily lives: the yogurt cup from the supermarket, the blood collection tube at the doctor's office, or the mattress we sleep on every night. The Greiner product universe is incredibly varied. We faced numerous product quality and safety requirements across the entire product portfolio. Medical devices and food packaging are subject to particularly strict regulatory requirements to ensure that our products are safe for consumers. It goes without saying that we meet these regulatory standards because our customers and consumers trust that our products are safe.

58 of our production sites are certified to ISO 9001 or an equivalent standard. These certifications ensure that product development processes are defined and implemented. In addition, we use a comprehensive range of other management system certifications within the Group to ensure the quality and safety of our products. The management systems we have introduced are continuously being improved through regular internal and external audits. This allows for regular verification of compliance with product quality requirements. If nonconformities are identified, appropriate actions and activities are initiated immediately and their effective implementation is monitored.

Ensuring product quality

In addition to the far-reaching ISO 9001 standard, the BRC Global Food Safety Standard plays a central role in the food and food packaging industry. It is the world's leading food safety standard and has been developed to provide clear safety, quality, and operational criteria for food manufacturers. These criteria are designed to ensure that all legal and consumer protection requirements are met. We are required to follow the standard in connection with the manufacture of food packaging, and it serves as a guideline for the safe production of our products.

In the medical devices sector, in addition to ISO 9001, ISO 13485 certification forms the basis for manufacturing products that meet the highest standards of quality and safety. ISO 13485 focuses on product safety and contains detailed requirements for product design, manufacture, and marketing. In addition to these standards, there are specific requirements for products that are listed by the FDA (US Food and Drug Administration) or that have to meet European requirements under the MDR (European Medical Device Regulation) or IVDR (In Vitro Diagnostic Device Regulation). The stringent regulatory requirements mean that medical devices need to be risk-assessed according to ISO 14971.



In the foam sector, ISO 9001 forms the basis for producing safe and compliant products. Similar to the packaging sector, compliance with the REACH Regulation, which regulates the registration, evaluation, authorization, and restriction of chemicals, is a basic prerequisite for the production of safe, high-quality products. Depending on the particular industry in the foam sector, compliance with a wide variety of norms and standards is a must, from the IATF 16949 standard (in the automotive industry) to the EN 9100 standard (for organizations in the aerospace industry). In addition, other product and management system certifications such as CertiPur (a testing, analysis and certification program for the environmental, health & safety properties of polyurethane foam), OEKO-TEX® STAN-DARD 100 (label for textiles tested for harmful substances) or OEKO-TEX® STeP are proof that product quality and consumer safety are our top priorities.

Developing sustainable products

Sustainable products typically have very little or, at best, no negative environmental impact throughout the product's entire life cycle. In other words, a sustainable product design minimizes the product's environmental footprint at all stages of the value chain. This means using materials as efficiently as possible along the entire value chain, maximizing energy efficiency, minimizing emissions and other environmental impacts as well as avoiding waste by using secondary materials, increasing recyclability, or promoting re-use solutions.

That is the reason why we are increasingly focusing on product design. The decisions we make at this stage can have a significant impact on the environment down the road, whether they involve the efficient use of materials and energy or the use of secondary or bio-based raw materials. All these decisions affect the carbon footprint of each product and ultimately that of the Greiner Group as a whole. Over the past few years,

we have calculated a product carbon footprint for many of our products. To take a more integrated approach, we have set ourselves the goal of calculating carbon footprints for all major product groups in all three divisions by the end of 2024. Division-specific tools to independently calculate the carbon footprint of our products were developed in the 2023 reporting period. The results can be used to calculate carbon reduction potential, which can then be incorporated into future product innovations.

However, we want to not only determine the carbon emitted by our products but also prepare life cycle assessments (LCAs). With the help of these assessments, we can analyze a number of potential environmental impacts that our products have over their entire life cycle. We started calculating the first life cycle assessments in 2023. We intend to gradually expand these analyses and have set ourselves the goal of conducting life cycle analyses for all major product groups in all three divisions by the end of 2025. The knowledge gained from these analyses will then inform our product development processes.

Life cycle analysis for Greiner Bio-One multi-use transport boxes

We are deeply committed to promoting reuse because it gives us great leverage to reduce our environmental impact. For example, a life cycle analysis has shown that the reusable transport boxes produced by the Greiner Bio-One division have a significant environmental advantage over single-use transport bags. The analysis covered several impact categories, including climate and ozone depletion.

Greiner Bio-One multi-use transport boxes such as the VACUETTE® transport box (VTB) for 40 tubes pictured here have a significant environmental advantage.



Pushing for a circular economy

We want to move away from a linear throwaway economy and instead push for a sustainable circular economy. In a linear system, a product is produced, used, and then thrown away. To become a circular company, we need to think of our products in a circular way. In addition to the recycling and reuse of products, there are other options such as extending the life of products and switching from single-use to reusable products. Some of our products, like the classic yogurt cup or VACUETTE® tube, have very short useful lives and are usually used only once. By contrast, soundproofing products or mattresses, for example, have multi-year lifespans. Whether short or long lived, all these products have one thing in common:

They must be disposed of at the end of their useful life, often through incineration. And this is exactly where we want to go in the future: closing these material loops and reusing previously used materials to make new products.

To be successful in these efforts, we need to pay more attention to the end of the product life cycle. Except as part of pilot products, we do not currently have any active product return systems in place. This means that to achieve a circular economy, we need to think beyond corporate boundaries and collaborate and cooperate across sectors and along the entire value chain.

Greiner Innoventures focuses on the circular economy

Greiner Innoventures is Greiner's corporate business angel and plays an important strategic role in developing new business areas. In the future, there will be an even greater focus on identifying and developing innovations and business models for a functioning circular economy. Some examples of circular start-ups where investments have already been made include MATR (mattress solutions for the hotel industry) and Hempstatic (noise insulation panels made from industrial hemp).

→ More information: [Our performance / Development of the Group](#)

The construction and building sector is responsible for almost 40 percent of global CO₂ emissions. The start-up Hempstatic uses agricultural hemp industry residues to produce CO₂-absorbing, recyclable indoor soundproofing systems.



Projects and measures

We work hard to make the vision of sustainable products and closed material loops a reality, whether by reducing the amount of material, switching to reusable solutions, increasing recyclability, incorporating more secondary materials, or using sustainable plastics. A sampling of our many projects and initiatives underscores our efforts:



Certification for compostable coffee capsules

Greiner Packaging developed a compostable polymer solution to improve the environmental footprint of capsule packaging. Used capsules can simply be discarded in the garden compost. The capsules were certified by TÜV AUSTRIA BELGIUM nv in 2023. Tests confirmed that Greiner Packaging capsules meet the high requirements of the "OK Home Compost" certificate. The certificate is only awarded to products that can be composted at low temperatures such as those found in backyard compost heaps.



The Holy Grail 2.0 project explores how digital watermarks can be used on a large scale.

GPOil project optimizes chemical recycling at Greiner Packaging

The research project aims to convert non-recyclable plastic waste, currently used as refuse-derived fuel (RDF), into valuable raw materials that can be chemically synthesized into new plastics. State-of-the-art pyrolysis technologies were used to generate oil from a variety of materials such as films, RDF fractions, and even coffee capsules from a collection that is currently being set up at the plant. This process harbors tremendous potential, as underscored by a yield of 60 to 80 percent pyrolysis oil, depending on the materials used. The GPOil project, which is well advanced and scheduled to run until 2024, is now focusing on the detailed characterization of the oil produced. Special attention is paid to the purity of the hydrocarbon compounds to optimize the quality of the oil for the industrial cracking plants (production of raw materials for plastics).

Use of reusable drinking cups

By developing reusable drinking cups, Greiner Packaging has taken another major step towards a circular economy. The use of RFID chips also makes it possible to accurately count the number of cycles and optimize the underlying logistics processes. Reusable cups can be re-used up to 150 times without degrading and can be more environmentally friendly than single-use cups after as few as five cycles. These help protect our environment by conserving valuable resources and eliminating plastic waste.

New steps in the Holy Grail 2.0 project

Digital watermarks are invisible to the human eye and contain a great deal of information. They will play an important role in product recyclability in the packaging market and sorting facilities. Greiner Packaging and over 160 other companies are members of the HolyGrail 2.0 digital watermarks initiative. Driven by AIM – European Brands Association, powered by the Alliance to End Plastic Waste. This project explores how digital watermarks can be used on a large scale. In what is now the third phase of the initiative, digital watermarks are demonstrating their potential under real market conditions.

From yellow recycling bags to beverage trays

Greiner Packaging and its partners took a further step towards a circular economy in 2023. Moving forward, Rauch brand beverages will also be presented in supermarkets in trays made from 70 percent PCR (post-consumer recycled) r-PET material. Recycled trays are made from waste collected in the yellow recycling bag. This tray-to-tray recycling reduces dependence on the PET bottle flow.

Greiner Packaging

More details and other exciting projects can be found on Greiner Packaging's website. greiner-gpi.com



Greiner Packaging's reusable drinking cups stand out thanks to their high quality and impressive lifespan.



Greiner Packaging's recycled trays for the Rauch brand are made of 70 percent r-PET.



→ More information: [Our Performance / Divisions / Greiner Packaging](#)

Pioneering the industry with REDcert² certification

NEVEON was successfully audited and has been REDcert² certified since April 2023, making it an industry pioneer. REDcert² is an initiative of leading associations and organizations of the German agricultural and biofuel industry. The REDcert² system for the certification of sustainable material flows in the chemical industry sets additional requirements for sustainability certification that go beyond the legal requirements of the REDcert² EU certification. NEVEON contributes to the decarbonization of PU value chains by using the REDcert² mass balance approach.



NEVEON received its REDcert² certification in 2023.



NEVEON produces high-quality foam blocks with a recycled content of 80 percent in the polyol component and uses them to make high-quality mattresses.

Milestones in mattress recycling

In 2023, NEVEON succeeded in producing high-quality foam blocks with a recycled content of 80 percent in the polyol component and transforming them into high-quality mattresses. They are made from a repolyol that is 100 percent derived from old mattresses using a recycling process developed by BASF. Another milestone was also reached in the year 2023: Even though they cannot yet be produced on an industrial scale, they were used for the first time at BASF's Hotel René Bohn.



BASF and NEVEON provide hotels with recycled mattresses

→ More information: [Our Performance / Divisions / NEVEON](#)



More details and other exciting projects can be found on NEVEON's website.
neveon.com



Greiner Bio-One's rack-back project shows that steps can also be taken to create a more circular economy in the medical technology sector.



Rack back: reuse of pipette tip racks

The rack-back initiative was launched at the Greiner Bio-One site in Mosonmagyaróvár, Hungary, in March 2022. Clean, empty pipette tip racks are taken back, cleaned, and offered to customers to be re-used or recycled externally. The racks are collected when the regular deliveries are made to customers. Collected racks are made available to customers for reuse free of charge and while supplies last. When racks are recycled, an external partner recycles the materials. Through the rack-back project, Greiner Bio-One is showing how pipette tip racks can be reused and recycled, as well as how steps can be taken to create a more circular economy in the medical technology sector.



The rack-back initiative involves re-using or recycling Greiner Bio-One racks.



More details and other exciting projects can be found on Greiner Bio-One's website. [gbo.com](https://www.gbo.com)



Outlook: Products

We will continue to focus on developing sustainable products. This is why we will calculate product carbon footprints for all material product groups in 2024 and incorporate the findings into our product development processes. We will continue to refine the tools that we have developed to calculate product carbon footprints and will also seek ISO 14067 certification in 2024. Increasing importance is also being given to life cycle assessment calculations and the associated consideration of multiple impact categories. That is why we will continue

to press ahead with this issue in the coming year. In addition to internal adjustments, the end of the product life cycle will continue to be a key aspect of sustainable product development. We will continue to develop products, work on ongoing projects, and actively look for start-ups in the circular economy space. With our innovative spirit and expertise, we will continue our journey towards circularity with strong partners.

Waste



Nothing beats switching from a linear to a circular economic system. This requires a radically different approach to how we use our resources. Raw materials must be extracted in an environmentally sound manner. The products made from them must be manufactured in a way that conserves resources and minimizes waste. We improved our waste management system in 2023 by conducting a thorough analysis of our waste generation and collaborating across the value chain. A number of waste reduction projects were also implemented.

Waste in a global context

The growing volume of waste around the world poses a significant challenge since much of it is still improperly dumped or disposed of in landfills or incinerators. Inadequate or improper waste management negatively impacts not only the environment but also human health and society as a whole. It also entails the loss of valuable materials. Transitioning to a circular economy of reduction, reuse and recycling continues to require considerable effort.

In our Blue Plan sustainability strategy, we set ourselves the goal of becoming a circular economy company by 2030. At the same time, we aim to send zero waste to landfills in Europe by 2025 and globally by 2030. At the same time, we aim to increase the share of recycled waste in the total volume of waste to 50 percent by 2025 and 75 percent by 2030. Greiner Packaging also plans to make all of its packaging recyclable, reusable, or compostable by 2025. This measure is intended to reduce waste along our value chain.

We use awareness-raising measures both in product design and at waste-generating points in order to drive improvements in waste reduction. We also seek and maintain partnerships and memberships that not only support our transformation to a circular company but also fundamentally contribute to a sustainable future. Since 2019, for example, Greiner Packaging has been helping to remove plastic waste from the oceans near the Philippines through a joint project with Plastic Bank (see [Social Commitment](#) chapter). We are also strongly in favor of a global UN agreement to combat plastic pollution. Another way we can work toward a circular future is through collaborations and memberships.

Our waste management is guided by the five-stage waste hierarchy of the EU Waste Framework Directive. Waste should be prevented, reused, recycled, and then disposed of to reduce environmental impacts. The variety of collection systems and waste management laws at all our locations makes it difficult to take a uniform approach. Waste management regulations

are critical for a global company like Greiner when it comes to closing material loops. As a member of various organizations and platforms, we try to promote standardization and thereby improve waste systems.

In addition, in preparation for the new EU Corporate Sustainability Reporting Directive (CSRD), we conducted an in-depth Group-wide gap analysis of our environmental standards during the reporting period and adapted our reporting process to meet the new reporting requirements.

Corporate waste management

We are a company that processes plastics and foam and produces waste during processing. Clean rejects are recycled directly into the production process through internal recycling processes and reintegrated into the production process wherever technically feasible. Rejects that we cannot process directly are sorted, collected and then disposed of or recycled by external companies specializing in this field. Plastic waste is the Greiner Group's largest waste fraction by weight.

Many of our production sites employ waste management concepts to achieve continuous improvements. Environmental management systems also help to optimize waste streams and the collection and shipment of waste. A total of 36 sites have been certified to ISO 14001.

Best practice survey in waste data collection

We took a closer look at the challenges of waste data collection at the various locations as part of an academic thesis paper in order to gain a more detailed insight into the processes involved. Interviews were conducted with data collectors at selected sites to gain a better understanding of current challenges and obtain concrete suggestions for improving future waste reporting. The results have revealed a need for additional support in the data collection process. This includes increasing the frequency of communication with data collectors and the number of reporting cycles as well as providing customized support materials for data documentation. This feedback is used to improve reporting. The first consequence was a reduction in data collection frequency for waste metrics from one year to one quarter.

Waste generated [in t]

	2021	2022	2023
PE foam waste	432	263	122
Solid hazardous waste	75	288	285
Metal waste	1,145	665	800
Liquid hazardous waste	899	783	1,151
Wood waste	1,020	1,064	1,153
PU foam waste	1,578	1,682	1,140
Other waste	3,484	2,254	2,535
Paper and cardboard waste	3,975	3,788	3,834
Residual waste	5,673	5,613	6,100
Plastic waste	10,424	7,543	8,106
Greiner total	28,704	23,943	25,227

In 2022, we began keeping track of by-products as well as waste quantities. Tracking by-products and waste is a challenging task since legal definitions are not always clearly interpreted in practice. This is why we are in regular communication with experts in this field in order to make annual adjustments where necessary. To further improve documentation of all by-products in production processes that were previously not strictly reported, we expanded and refined by-product tracking in 2023. As a result, the total quantity of by-products reported increased by about ten-fold. Thanks to this more precise data collection, a clearer definition of waste was established and by-products that were not reported in previous years or incorrectly recorded as waste were presented more accurately.

Most of the waste produced by the Greiner Group consists of plastic waste from our production processes. This explains the high share (94 percent) of non-hazardous waste. Along with plastic and foam waste, the Greiner Group also generates non-recyclable waste, paper and cardboard, wood, metal, and other waste fractions (such as biogenic waste). Our waste is exclusively handled by external recyclers that have the necessary waste recycling concessions or infrastructure in place.

The majority of the “Hazardous waste” category consists of oil waste from production and laboratory waste generated in the production of additives and other production processes. These substances are always sent to specialized waste management companies.

Waste generated by Division [in t]

	2021	2022	2023
Greiner Packaging			
Non-hazardous waste	9,661	7,639	8,986
Hazardous waste	122	270	309
NEVEON			
Non-hazardous waste	11,826	9,945	10,167
Hazardous waste	260	346	566
Greiner Bio-One			
Non-hazardous waste	5,075	5,282	4,629
Hazardous waste	592	455	560
Greiner total²			
Non-hazardous waste	27,730	22,872	23,800
Hazardous waste	974	1,071	1,436

¹ Slight differences in key figures in 2022 are due to improved data quality.

² Contains waste volumes of Greiner AG ³ Differences in key figures compared to the last publication are due to improved data quality.

Group-wide waste quantities rose slightly to 25,227 tons in the 2023 reporting period. This is five percent higher than in the previous year. By defining by-products and waste more precisely and providing a more detailed breakdown of by-products, the quantity of PE foam waste halved and PU foam waste reduced by a third. The sharp year-on-year rise in liquid hazardous waste is striking (47 percent). This is because one production site had to dispose of cleaning water contaminated with oil as liquid hazardous waste. In absolute terms, plastics waste and non-recyclable waste saw the greatest increases.

Waste disposal and recycling

With a waste volume of over 25,000 tons, it is essential that we understand how to treat the materials we no longer need. We comply with the national legal requirements at our company sites, which are responsible for recycling and disposal. Processes vary on account of different, division-specific materials and local waste management systems.

Measured by total volume of waste, most of our waste in 2023 was incinerated (44 percent) or recycled (42 percent). Our medium-term Blue Plan target is to recycle 50 percent of our waste by 2025. Given that we are already at 42 percent, we are confident that we will achieve this target. Moreover, only nine percent of our waste was sent to landfill, an impressive decline of nearly 1,000 tons on the previous year. This marks a reduction of 30 percent based on the total volume of our landfill waste. This is thanks to gradual process optimization and the successful pilot project at the Nyrsko (NEVEON) production site. This brings us far closer to achieving our Blue Plan goal of sending zero waste to landfills in Europe by 2025 and globally by 2030. Nevertheless, 2,345 tons of our total waste was still sent to landfill globally in the reporting period.

Waste sent to landfill³ [in t]

	2021	2022	2023
Global	3,004	3,339	2,345
Europe	1,751	1,743	867

Total waste by disposal and recovery process [in %]

	2021	2022	2023
Incineration	39	39	44
Landfilling	10	14	9
Recycling	44	43	42
other or unknown disposal	7	4	4

Supplier collaboration and product changes to reduce waste

We carried out a comprehensive analysis of the largest waste streams as part of a pilot project at the Czech site in Nyrsko (NEVEON). These findings were used to develop a detailed 2024 action plan aimed at reducing the amount of waste sent to landfills. The plan employs product modifications and closer partnerships with suppliers to develop innovative approaches to waste prevention.

One particularly noteworthy measure concerns a change in the production of insulation for hot water storage tanks. Previously, it involved glueing two materials together, resulting in offcuts that were not recycled but sent to landfills instead. To eliminate this problem, we switched to non-glued plates as part of a pilot project. Following a successful test phase in which the high quality standards were maintained, the switch makes it possible to dispose of the two materials separately. Both materials can now be pressed and returned to the supplier, who reuses them in various applications, including in our own products in the case of nonwoven fabrics.

Overall, this product change – combined with other measures such as the return of textiles, packaging film and cardboard and more precise sorting – has reduced on-site landfill waste by around 70 percent (250 tons).

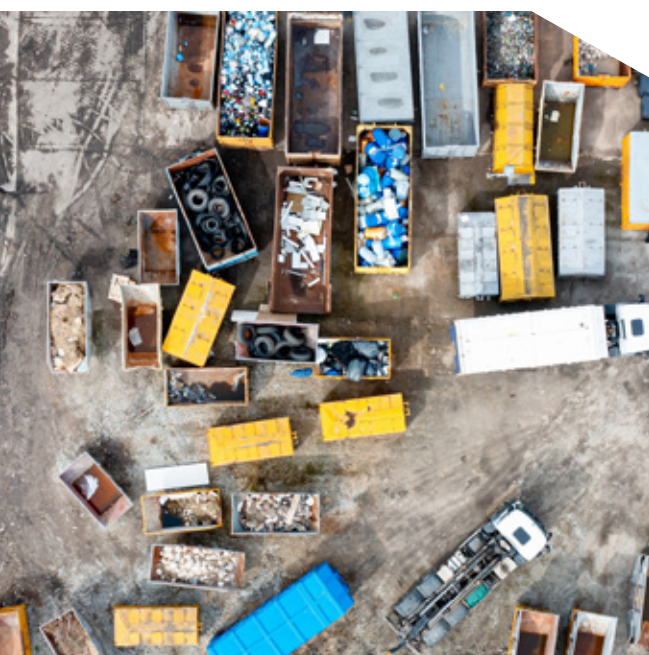
Waste directed to recovery or disposal [in t]

	2021	2022	2023
Greiner Packaging			
Waste diverted from disposal			
Recycled hazardous waste	72	111	126
Recycled non-hazardous waste	7,253	5,665	6,101
Hazardous waste directed to disposal			
Incineration	13	41	113
Landfilling	0	6	1
Other or unknown disposal	37	112	69
Non-hazardous waste directed to disposal			
Incineration	607	870	2,174
Landfilling	1,078	1,038	634
Other or unknown disposal	723	66	77
NEVEON			
Waste diverted from disposal			
Recycled hazardous waste	21	48	222
Recycled non-hazardous waste	1,422	1,993	1,879
Hazardous waste directed to disposal			
Incineration	96	270	325
Landfilling	0	0	3
Other or unknown disposal	142	28	15
Non-hazardous waste directed to disposal			
Incineration	8,894	6,565	7,156
Landfilling	734	808	342
Other or unknown disposal	777	578	790
Greiner Bio-One			
Waste diverted from disposal			
Recycled hazardous waste	511	390	431
Recycled non-hazardous waste	2,491	2,119	1,915
Hazardous waste directed to disposal			
Incineration	45	19	44
Landfilling	18	38	30
Other or unknown disposal	18	8	56
Non-hazardous waste directed to disposal			
Incineration	1,296	1,541	1,322
Landfilling	1,089	1,448	1,335
Other or unknown disposal	200	175	48

Greiner total ⁴	2021	2022	2023
Waste diverted from disposal			
Recycled hazardous waste	605	549	779
Recycled non-hazardous waste	12,070	9,777	9,898
Hazardous waste directed to disposal			
Incineration	154	329	482
Landfilling	18	44	34
Other or unknown disposal	198	148	140
Non-hazardous waste directed to disposal			
Incineration	10,942	8,976	10,656
Landfilling	2,986	3,295	2,311
Other or unknown disposal	1,732	824	927
Total waste by disposal method			
Recycling	12,675	10,326	10,677
Incineration	11,096	9,306	11,138
Landfilling	3,004	3,339	2,345
Other or unknown disposal	1,930	972	1,068

⁴ Contains waste volumes from Greiner AG

Differences in key figures compared to the last publication are due to improved data quality.



In some countries, accurately recording our waste treatment processes is still a challenge. One of the main reasons for this is that waste management companies do not clearly communicate information on treatment processes for company-specific waste and national legal requirements vary greatly. However, current and future regulatory conditions make us confident that this situation will improve in the coming years. At present,

the share of our waste generated with unknown or other treatment processes is still four percent, which is almost the same proportionally as in the previous year. To increase the transparency of our waste, it is essentially that we further reduce the quantity of waste with unknown treatment processes.

Outlook: Waste

In the upcoming reporting period, we will build on our waste analysis findings to develop targeted waste reduction measures. At the same time, we will focus more and more on our goals for 2025: to send no more waste to landfills in Europe and to recycle at least half of our waste. Given the differences in national legislation and the lack of internationally standardized definitions in waste management, it is important to create consistent standards and further improve data quality. In addition, we are focused on carefully applying the EU Corporate Sustainability Reporting Directive to ensure its phased implementation.

Water

Water is a vital resource for people and the environment and must be used carefully. We primarily use water in closed cooling circuits for production and cooling purposes and to operate sanitation facilities. We use and consume much less water than companies in other industries. Water was no longer considered material in our most recent materiality analysis. However, we are voluntarily reporting on water this year to provide transparency into the steps that we have taken and show how seriously we take the careful use of resources. Nothing beats transparency.



Complying with regulations and minimizing risks

The use of water is subject to extensive local, regional, and national regulations and requirements. Although we do not operate any wastewater treatment plants, top priority is given to strict compliance with all obligations at water-using sites. In addition to national laws and local regulations, certain Greiner production sites require the testing of returned water and the measurement of specific threshold values or substances of concern. We prevent environmental violations through our standardized processes and systems and by working closely with the relevant authorities and bodies. There were no such violations in the last reporting period.

In addition, we assess the regulatory, physical, and reputational risks for all Greiner production sites annually using the WWF Water Risk Filter. We comply with all the regulations imposed on us in order to minimize regulatory risk. This includes the mandatory inspection, compliance, and documentation of threshold values at certain locations before used water is returned. Physical risks, such as water shortages or flooding, can occur due to geographical locations. Thanks to our implemented and certified management systems and processes, the appropriate structures are already in place to enable us to identify suitable measures and optimally protect our operations and the environment and prevent damage. The careful and responsible management of our physical and regulatory risks ultimately forms the basis for minimizing reputational risk. This approach enables us to minimize all risks and possible adverse effects, thereby ensuring our contribution to protecting the environment.

Clearly defined approach

We conducted an extensive water management evaluation back in 2022. Since then, we have been identifying sites in both water-risk areas and water-stressed areas. We use the WWF Water Risk Filter and apply both the basin risk and the operational risk method. In the 2023 reporting year, we refined this approach and made further progress with the technical software integration for collecting all non-financial key figures. Due to these necessary adjustments, the Water Policy for all Greiner sites will be completed in 2024.

The process of using the Water Risk Filter begins with using the basin risk method each year to determine whether a site is to be classified as a water-risk¹ or water-stressed area². If a site falls into either category, it is analyzed again in more detail using the operational risk method. This second assessment is much more specific to the site's circumstances and provides a more comprehensive and realistic picture of the actual on-site risks. If this in-depth analysis shows that the site should still be considered a water-stressed or water-risk site, the results of the assessment must be implemented at the site via the existing management systems or corresponding processes. The site must interpret the results accordingly, assess their relevance, document them, and identify suitable responses.

In line with our multi-stage process, water stress and water risk were first determined according to the basin risk method in 2023. Following this initial classification, which was based on purely statistical data according to geographical location and industry, four locations with water stress and 18 locations with water risk were identified. As per our defined procedure, the next step will be to calculate the operational risk for the locations in question. Primary data has been collected from the respective sites and analyzed in order to calculate the operational risk. Based on the results of this primary data collection, the defined thresholds were not reached and therefore there is no operational risk for our locations in the regions subject to water stress and water risk. The water withdrawal, discharge and consumption quantities from water-stressed areas are shown in the overview of key figures on page 236.

Outside of this centralized approach that applies to all our production sites, twelve production sites conducted their own on-site risk assessment in 2023 and eight production sites defined their own water policies, and three of our four water-stressed locations have identified water savings potential.

¹ A site is considered a water-risk site if the overall risk is equal to or higher than factor 3. ² In order to classify a site as being located in a water-stressed area or not, a threshold value of factor 3 or higher will be used, but only for the subcategory water scarcity.

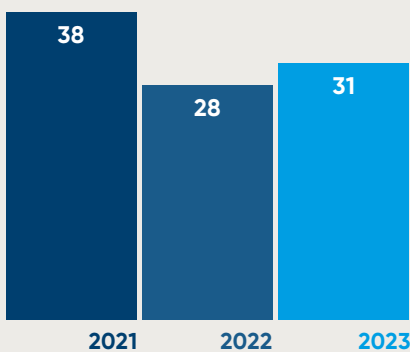
Water in numbers

We collect data on our water consumption using site-based water meter readings, invoices, or estimates. Our sites collect non-financial data directly in our software and aggregate it at the Group level. Groundwater is the most commonly used water source at Greiner. About 47 percent of the water we use comes from groundwater sources. Almost all of it is returned to groundwater sources. Surface water accounts for 36 percent of water use, while only around 17 percent is sourced from third parties. The total amount of water withdrawn but also discharged increased slightly year on year.

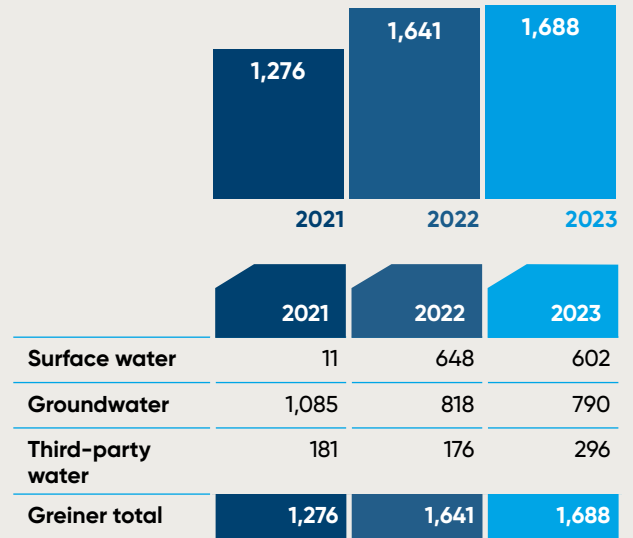
Once again, our production sites implemented numerous water efficiency measures last year. The number of implemented measures increased by 50 percent from 2022 to twelve. The measures range from smaller actions, such as improved irrigation systems, automatic shut-off valves in showers, new flushing systems for toilets, or the installation of faucets with handwashing timers, to larger investments such as the installation of a water withdrawal measuring system, new water filters and various process improvements to reduce water consumption.

There was a slight increase in total water consumption during the last reporting period. Our total water consumption is calculated as the difference between water withdrawal and water discharge and amounted to 31 megaliters in 2023. This is equivalent to an increase of around eleven percent year on year and mainly relates to the continuous improvement in data quality. Water storage has no notable effluent or process water effects at Greiner.

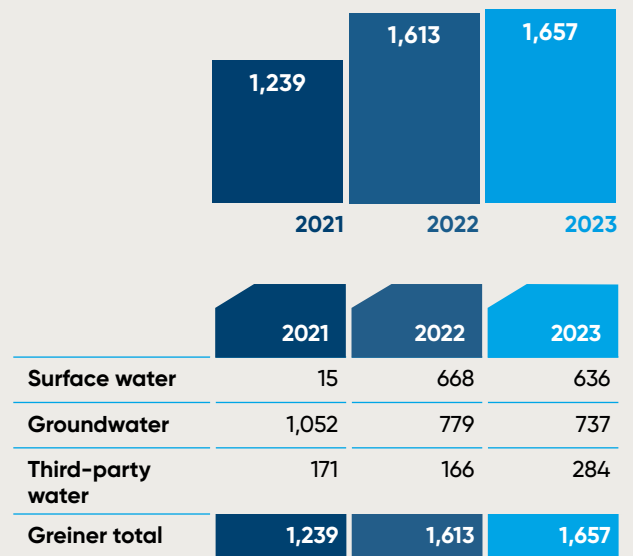
Total water consumption [in Ml]



Water withdrawal [in Ml]



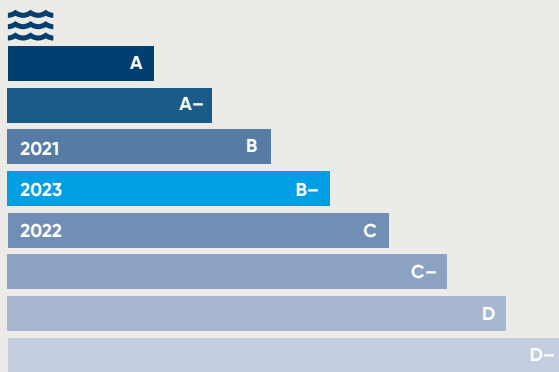
Water discharge [in Ml]



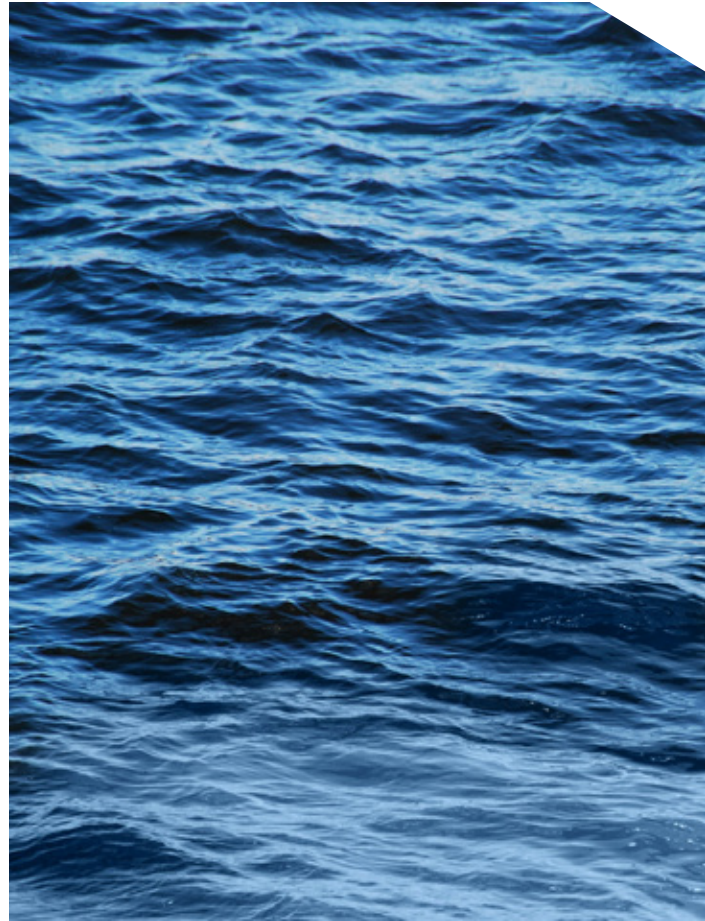
We worked closely in the previous reporting year on improving overall data quality. As a result of the improved data quality, minor corrections were also made to water withdrawal, discharge, and consumption quantities for 2021 and 2022.

We have been reporting water security data using the CDP disclosure since 2018. We also make our performance publicly available to interested stakeholders. Over the last two years, we have stepped up our efforts to improve overall water management at Greiner and satisfy the increasing requirements and changes to the CDP platform.

Our CDP water security score



After earning a 'C' rating in 2022, we were rated B- in 2023. Although water is no longer considered a material topic at Greiner, we will continue to work on improving our CDP rating in the future.



Outlook: Water

We have conducted a comprehensive evaluation of our approach over the past two years and made numerous adjustments to our water management practices as a result. In 2024, we will incorporate the defined procedures into the Water Policy that applies to all Greiner locations and roll them out across the entire Group. We also need to further integrate the WWF Water Risk Filter in our software for the collection of non-financial key figures. We are confident that the implementation of these steps is the most effective and appropriate approach for effectively managing this issue. Based on our new materiality analysis conducted in 2023, our sustainability

efforts over the next few years will focus on material sustainability issues. This means that the revision of the water target communicated in the last report to reduce water consumption in water-risk areas by 2030 is no longer one of our objectives.

Although water is no longer considered material and so we will no longer be setting targets, we will continue to regularly update the assessments of our production sites moving ahead and, in the event of changing classifications, act in accordance with the defined procedure. We will continue to work on our water management performance and have this assessed by CDP in the future.