



alzchem
group

AGILE SCIENCE PURE RESULTS

For the Trostberg, Schalchen, Hart,
Waldkraiburg sites

ENVIRONMENTAL STATEMENT 2023

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FOREWORD



Foreword

Dear Reader,

Alzchem is a globally active specialty chemicals company that is predominantly one of the market leaders in its fields of activity. Alzchem benefits in particular from the three very different global developments of climate change, population growth and longer life expectancy. Alzchem products can offer attractive solutions for achieving the resulting social goals with a variety of different applications.

The company sees interesting growth prospects for itself above all in the areas of human and animal nutrition and agriculture. As a result of population growth, it is important to achieve efficient food production. The pharmaceutical raw materials and our creatine products can contribute to healthy ageing with a higher life expectancy. Alzchem is facing up to the goal of sustainability, which arises from climate change, in the field of renewable energies and across the entire company. The fields of fine chemicals and metallurgy offer just as great a perspective.

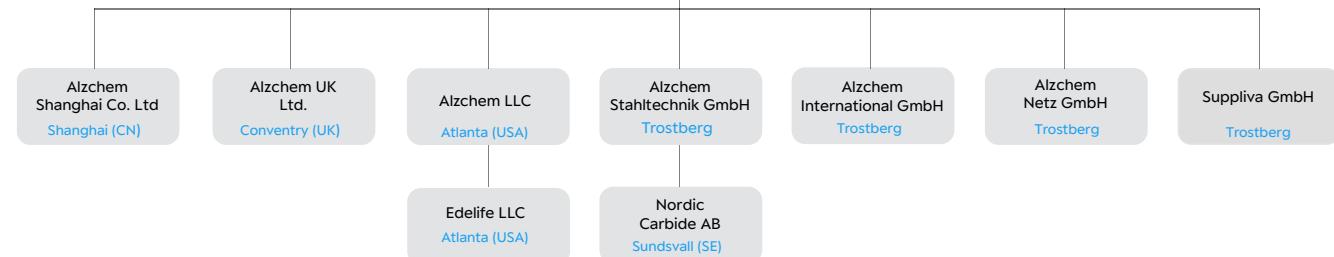
The broad product spectrum of Alzchem Group AG includes nutritional supplements, precursors for corona tests and pharmaceutical raw materials. These products are our company's response to global trends and developments. Alzchem is optimally positioned here and sees itself as being prepared for an environmental future and global developments.

The company employs around 1,680 people at four production sites in Germany and one plant in Sweden, as well as in three sales offices in the USA, China and England. In 2022,

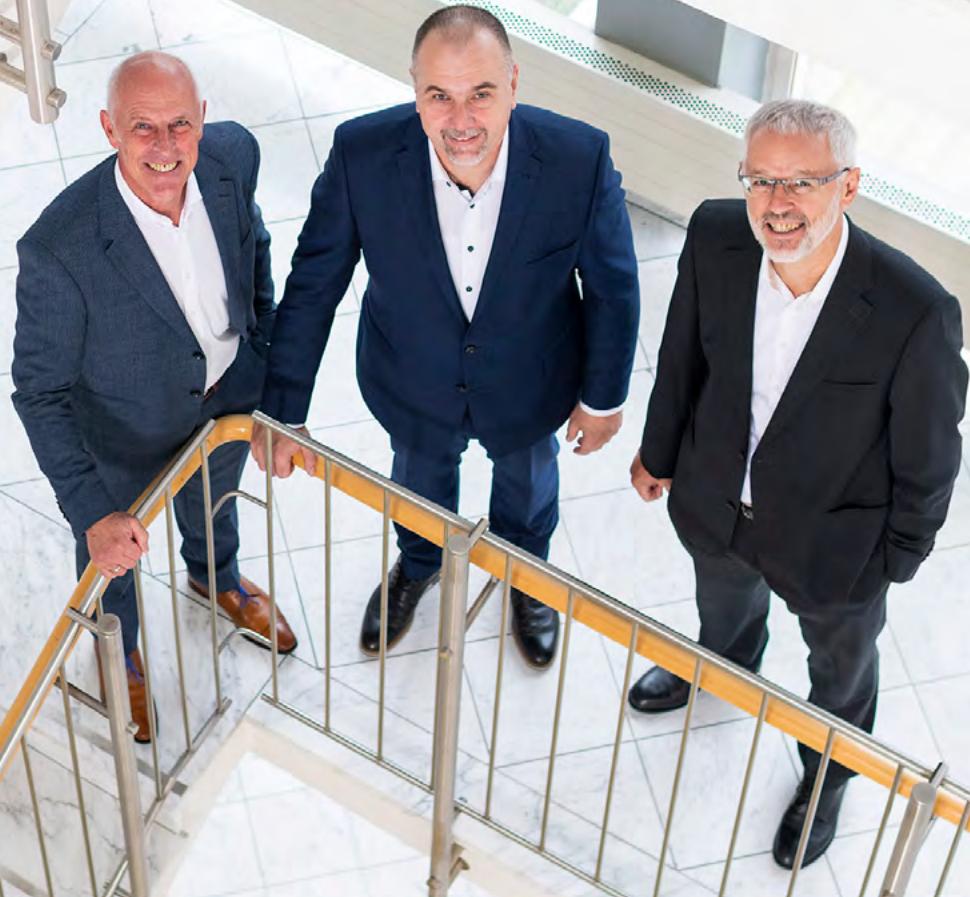
Alzchem generated consolidated sales of around EUR 542.2 million and EBITDA of around EUR 61.4 million.

**Alzchem Group AG
Trostberg**

**Alzchem Trostberg GmbH
Trostberg**



Our vision



Klaus Englmaier (COO)

Andreas Niedermaier (CEO)

Dr. Georg Weichselbaumer (CSO)

With innovative, sustainable chemistry based on our integrated production network, we deliver customer-oriented applications to selected markets.

Our production processes are based on electricity and not on oil. That's why we can focus our investments entirely on new products and processes. Electricity is the energy of the future, and it is becoming greener all the time - which automatically makes our products greener too.

Sustainability is part of our corporate strategy. It serves us as a road map for a successful future. A high level of transparency in all environmental matters is very important to us. That is why we have been EMAScertified (Eco-Management and Audit Scheme, also known as EU Eco-Audit) since 1997 and have been a founding member of the first Environmental Pact of Bavaria in 1995and its successor, the Environmental and Climate Pact of Bavaria.

Alzchem has also joined the Responsible Care initiative in 2021 and is thus committed to constantly improving the protection of health and the environment as well as the safety of employees and fellow citizens on the basis of its own responsibility.

In this updated environmental statement of Alzchem Trostberg GmbH, we would like to give you an overview of our core indicators, our input-output balance and our environmental programme (=IMS programme).

This update supplements the comprehensive environmental statement published last year with the latest information for the reporting year 2022.

Your Executive Board of Alzchem Group AG

TROSTBERG SITE



KEY FIGURES ON ENVIRONMENTAL PERFORMANCE

Key figures Trostberg site		2020	2021	2022
Production output		214.1	273.1	254.6
Environmental indicators				
Use of raw materials	t/t product	1.06	0.96	1.01
Fuel consumption	MWh/t Produkt	0.48	0.38	0.35
Power consumption	MWh/t product	0.42	0.35	0.35
thereof renewable energies	MWh/t product	0.01	0.01	-*)
Water consumption	m³/t product	74.4	64.9	60.7
Waste generation **) (production-specific)	t/t product	0.101	0.079	0.084
thereof dangerous	t/t product	0.097	0.063	0.065
Ammonia emissions	kg/t product	0.044	0.035	0.023
Dust emissions	kg/t product	0.003	0.003	0.003
CO ₂ emissions Scope 1 calculated according to GHG Protocol	t/t product	0.15	0.12	0.10
NO _x emissions	kg/t product	0.13	0.11	0.10
Total area site	m ² /t product	2.80	2.19	2.35
sealed surfaces	m ² /t product	1.03	0.81	0.87
near-natural areas	m ² /t product	0.05	0.45	0.48

*) Value for 2022 not yet available, the share of renewable electricity will only be communicated to Alzchem in the course of the year

**) For the sake of clarity, individual main waste groups are not shown in this table. The main waste groups are presented in more detail in the following tables for the site.

PRODUCTS

Products in t	2020	2021	2022
Total amount	214,071	273,109	254,578

The values for 2020 and 2021 differ from those in the Environmental Statement 2022 because a by-product from the Schalchen site, which is only stored temporarily in Trostberg, was incorrectly included in the production volume.

The total quantity of manufactured products has decreased by 7% in 2022. This reduction in volume is mainly due to the decline in the agricultural sector.

RAW MATERIALS, CONSUMABLES AND SUPPLIES

Material in t	2020	2021	2022
Raw materials	226,373	262,994	257,516

The amount of raw materials used decreased by 2% compared to the previous year. Compared to the production output, which decreased by 7%, an increase in the specific raw material consumption by 5% to 1.01 t raw material/t product is noticeable.

Around 80% of the raw materials are supplied by the neighbouring Alzchem sites in Hart and Schalchen.

In terms of quantity, nitrogen from the air separation plant in Trostberg and carbide and carbide furnace gas from the Hart site are the most important raw materials.

ENERGY

The site's energy demand in 2022 totalled 180 gigawatt-hours (GWh). Of this, 123 GWh (68%) was purchased energy in the form of electricity, natural gas and heating oil.

56 GWh (31%) came from the energy recovery of the carbide furnace gas produced as a by-product at the Hart site. Through internal heat recovery, an additional purchase of 17 GWh was avoided. Less than 1% is accounted for by fuels (diesel). In absolute terms, 9% less energy was used in 2022 compared to the previous year.

Energy in MWh	2020	2021	2022
Total energy use	190.940	196.881	179.569
Electrical energy	88.934	94.424	90.437
thereof renewable energies	1.541	1.632	*)
Carbide furnace gas	56.836	63.290	55.911
Natural gas	40.527	34.712	29.655
Heating oil	3.879	3.664	2.783
Fuels (diesel/petrol)	764	791	783
Heat recovery **)	15.185	18.800	17.329

The fuel quantities for 2020 and 2021 differ from those in the Environmental Statement 2022, as the fuel quantities that were supplied to other site companies in the form of steam were still included here.

*) Value for 2022 not yet available, the share of renewable electricity will only be communicated to Alzchem in the course of the year

**) External purchase of energy avoided through internal heat recovery

The specific energy consumption in 2022 was 0.71 MWh/t (previous year 0.72 MWh/t) and was thus reduced by 1%. This was mainly due to the lower production volumes of more energy-intensive products.

This overall picture is reflected in the fuel quantities used. The specific fuel input (including carbide furnace gas as an energy source) fell by 5 % from 0.37 MWh/t in 2021 to 0.35 MWh/t.

At 0.35 MWh/t, the specific electricity consumption remained the same as in the previous year.

The Hart site produces carbide furnace gas as a by-product, which, in addition to being primarily recycled, is also used to generate energy in the case of a surplus. The share of carbide furnace gas in the energy input was 12 % below the previous year's value due to the overall lower available quantity and a high material recycling. The total share of carbide furnace gas in energy use fell by 3% to 31% compared to the previous year.

The use of natural gas as an energy source was reduced by a further 16%, similar to the previous year. Alzchem has thus made a significant contribution to saving natural gas in the context with a gas shortage.

Heating oil and fuels (diesel and petrol) only account for a subordinate share of the energy supply and remain at a consistently low level.

Chemical processes, such as the production of calcium cyanamide, generate a considerable amount of reaction heat. The waste heat is transferred to the site's heat network in an internal heat recovery system. This is used for heating buildings, for pre-heating in the manufacturing processes and for heating water. The heat network was able to cover 10 % of the total energy demand and therefore did not have to be purchased.

The proof of the share of electricity from renewable sources is not yet available for 2022 and will only be communicated to us in the course of the year. In 2021, the share was slightly increased compared to 2020 and was a low 1.7%. This is mainly due to the fact that Alzchem, as an electricity-intensive company, makes use of a special equalisation scheme in accordance with the Renewable Energy Sources Act (EEG) and is particularly dependent on cheap electricity for economic reasons. Due to this equalisation scheme, Alzchem has to pay lower electricity surcharges, but only receives a small share of electricity from renewable sources.

In order to further increase the share of renewable electricity in the future and thus reduce CO₂ emissions from external energy purchases, Alzchem would like to build, among other things, its first ground-mounted photovoltaic plant at the Trostberg site.

92,875,495 kWh of electricity consumption was reported to BAFA for Trostberg. The difference results from the indirect electricity consumption for other companies at the site due to their partial supply of steam, compressed air, etc. for the generation of which electricity is also consumed.

WATER/WASTE WATER

Alzchem produces all the service water it needs in Trostberg from its own wells.

Drinking water is also supplied from the company's own wells east of the plant premises in Trostberg. A corresponding drinking water protection area has been designated. To secure the supply, there is also a connection to the municipal drinking water network in Trostberg, so that water can be supplied in both directions in the short term if required.

The industrial water pumping serves to supply the production plants with cooling water as well as for various other uses, including steam generation and as process and washing water in the production plants.

The pumped service water is fed into a ring main from which the consumers are supplied. Technical measures ensure that only the actually required amount of water is pumped and that no well water is discharged unused.

Water in m ³	2020	2021	2022
Service water (Alzchem)	15,836,517	17,629,364	15,343,133
Drinking water (Alzchem)	82,255	84,728	103,676

The majority of the water required by Alzchem - around 15.3 million m³ - is so-called process water. 99% of it is used as cooling water, is not polluted and is discharged directly into the Alz. A small proportion of less than 1 % is used in various processes in the plants.

Drinking water is mainly used in the sanitary facilities at the site.

The demand for process water was reduced in 2022. In relation to the production volume, water consumption fell from 64.6 m³/to product in the previous year to 60.3 m³/to product (-7%). In 2022, Alzchem launched a project to reduce its water footprint. In this project, all industrial water consumers were systematically recorded, consumption was analysed and measures for reduction were defined. This includes, for example, the optimisation of control systems and the multiple use of cooling water.

In addition to a change in the product mix, this has already contributed to a reduction in the absolute volume of water by around 2.3 million m³ in 2022 (-13%).

In the reporting year 2022, 51% (previous year: 59%) of the maximum amount of service water that was set by the authorities was used up.

Waste water in m ³	2020	2021	2022
Not requiring treatment (cooling water) (Alzchem)	15,789,159	17,566,694	15,291,488
Precipitation water	203,714	210,864	188,481
Operational waste water	47,358	62,670	51,645
Sanitary waste water (Indirect discharge into the municipal seweragetreatment plant) → Alzchem only!	66,657	84,204	103,676

In 2022, about 188,000 m³ of precipitation water from roofs and other sealed surfaces was discharged into the Alz. The rainwater is discharged together with the cooling water via a separate sewer system, which is permanently monitored analytically for contamination by permanently installed measurements. Before being discharged into the Alz, the water collected in the sewer system is passed through a retention basin where it is also continuously monitored by permanently installed measurements. In the event of contamination, the water is automatically retained in the retention basin before being discharged into the Alz.

Operational wastewater arises in various processes in the production plants, e.g. during product cleaning or waste gas scrubbing. A large part of this wastewater can be treated in the company's own central wastewater treatment plant (ZABA). The industrial waste water decreased by 18 % in 2022. The reason for this was the lower production output, a changed product mix and measures to reduce the amount of waste water. After treatment in the company's own central wastewater treatment plant (ZABA), a total of 51,645 m³ of treated wastewater was discharged into the Alz Canal in 2022 (previous year 62,670 m³). Waste water that cannot be treated in the ZABA is disposed of as liquid waste and is included in the waste balance sheet.

The permit for the discharge from the wastewater treatment plant (ZABA) into the Alz Canal expired at the end of 2022. Therefore, a new permit was applied for, which, however, could not yet be granted in 2022. For this reason, the previous permit was extended by the authorities by one year until the end of 2023.

The permit for discharging cooling water and rainwater into the Alz expires at the end of 2023 and must also be reapplied for.

For the approval procedure, the preparation of ecological reports by external experts was already started at the end of 2019. The expert opinion on the impact of the discharge from the ZABA was completed in 2022 and was part of the permit application.

The expert opinion on the discharge of cooling water and rainwater is still in progress.

In the expert reports, the effects of the discharges into the Alz or the Alz canal are determined on the basis of detailed studies. The report is the essential basis on which the authorities approve the permissibility and scope of the applied discharges.

Sanitary wastewater is fed to the Trostberg municipal wastewater treatment plant. Its composition corresponds to the usual waste water of private households.

CENTRAL WASTE WATER TREATMENT PLANT(ZABA)

The ZABA at the Trostberg site has two biological treatment stages. In the first stage, the more complex wastewater constituents are broken down into simpler compounds. This treatment stage is operated under exclusion of oxygen (anaerobic). Biogas is produced from the carbon compounds present in the waste water and ammonium from the nitrogen compounds. The biogas is used internally at ZABA in a boiler to generate energy.

The waste water pre-cleaned in the first stage is then fed into the second biological treatment stage. Here, the ammonium (NH4) is converted into atmospheric nitrogen by means of so-called nitrification/denitrification with the help of bacteria and the wastewater is thus finally purified.

The ZABA reduces the biochemical oxygen demand (BOD5) and the total bonded nitrogen (TNb) of the wastewater by more than 95 %. Both parameters are a measure for assessing the degree of pollution of the wastewater. Due to the very high elimination rates of the ZABA, the approved discharge values into the Alz canal are always reliably met.

On the one hand, ZABA is subject to an officially regulated self-monitoring by Alzchem, and on the other hand, samples of the wastewater are taken by the authorities themselves and analysed for compliance with the approved limit values. As part of the self-monitoring, an annual report is submitted to the Traunstein Water Management Office. In 2022, no limit value exceedance was detected by the technical water supervision as part of the official monitoring.

Pollutant loads in wastewater in kg (via ZABA)	2020	2021	2022	Utilisation of limit values 2022 *)
CSB	2,158	2,990	2,033	2.2 %
BOD ₅	70	84	80	n. r. **)
AOX	0.5	0.6	0.4	0.4 %
Phosphorus	19	17	18	9.9 %
Nitrogen anorg.	209	406	417	6.1 %

*) The percentage value given in this column indicates the extent to which the maximum permissible freight has been exhausted.

**) n. r. = no officially defined limit value defined

EMISSIONS

Emissions in t (to air)	2020	2021	2022
Dust	0.71	0.74	0.72
Nitrogen oxides (NOx)	27.28	29.12	26.37
Sulphur oxides (SO ₂)	5.59	7.90	7.11
Ammonia (NH ₃)	9.46	9.50	5.83
Carbon monoxide (CO)	8.04	10.56	10.33
Organic substances (org. C)	3.64	3.58	4.61
Carbon dioxide (CO ₂) Scope 1 calculated according to GHG Protocol	32,591	32,160	26,716

Exhaust gases contaminated with pollutants are largely fed into the waste incineration plant operated at the site, a thermal afterburning plant and a regenerative thermal oxidation plant (RTO plant) and cleaned there. In addition, local waste gas purification systems such as waste gas scrubbers, cryo-condensers, filters and active carbon absorbers are used.

The main remaining emissions to air at the Trostberg site are dust, nitrogen oxides (NOx), sulphur oxides (SOx), ammonia (NH₃), carbon monoxide (CO), organic substances (org. C) and carbon dioxide (CO₂).

Emissions of dust (-3%), nitrogen oxides (-9%), sulphur oxides (-10%) and carbon monoxide (-2%) were below the level of the previous year in absolute terms. In relation to the lower production volume in 2022, these emissions are within the range of the previous years.

The absolute increase in emissions of organic substances (+29 %) is mainly due to the continuous operation of the RTO plant commissioned in 2021, which meant that considerably more diffuse, previously uncollected waste air flows were fed into a waste gas purification system.

Emissions of ammonia (-39%) and CO₂ (-17%), on the other hand, fell sharply both in absolute terms and in relation to the quantity produced (ammonia -35%; CO₂ -11%).

This is mainly due to the significantly lower production volume in the agricultural sector.

Steam is required on a large scale as an energy source at the site. For steam generation in the boiler house, carbide furnace gas (CO gas) from Hart and natural gas are mainly used as primary energy. Their combustion produces large quantities of CO₂. Some of this can be recycled in a production process and is therefore not emitted into the atmosphere.

Other sources of CO₂ are drying processes, thermal waste gas/waste incineration facilities and, to a lesser extent, chemical and biological reactions.

CO₂ quantities from refrigerants are not shown here, as they account for significantly less than 1% of total CO₂ emissions.

CO₂ emissions from cars used for business purposes, for example for driving between the sites, also amount to a total of 38 tonnes of CO₂, which is significantly less than 1%. These are listed separately here and not reported under emissions.

The emission measurements required by the authorities were also carried out in full in 2022. In addition, Alzchem arranged for and carried out further measurements itself. During these emission measurements, individual, short-term exceedances of the officially approved limit values were detected. In these cases, the responsible authority was immediately informed about the situation and the further procedure regarding future avoidance was coordinated with them.

The emission data from our waste incineration plant (AGV) are published annually on the Alzchem Trostberg GmbH homepage (<https://www.alzchem.com/en/company/quality-environment/>). The data also show reliable operation of the plant in 2022.

NOISE

The Trostberg site is designated as a mixed area. The noise immission guide values are 60 dB(A) during the day and 45 dB(A) at night. The values were complied with according to the last measurement.

COMPLAINTS FROM THE NEIGHBOURHOOD

No complaints were reported to Alzchem in the reporting year 2022.

WASTE

Waste in t	2020	2021	2022
Total waste (Production-specific & non-production-specific)	26,578	25,606	23,820
Production-specific waste	21,542	21,550	21,281
thereof aqueous washing liquids and mother liquors *)	12,807	10,908	11,429
thereof halogenated reaction and distillation residues *)	6,101	4,528	3,495
thereof other organic solvents, washing liquids and mother liquors *)	920	727	794
Non-production-specific waste	5,037	4,056	2,539
Hazardous waste	20,925	17,278	16,910
Waste for external recovery	8,103	5,656	7,582

*) essential "production-specific waste types"

The trend towards further waste minimisation continued in 2022, with the total amount decreasing by 7% compared to 2021.

Production-specific waste is generated directly during the manufacture of our products and, at 21,281 t in 2022, also constitutes the largest share of waste. A variety of different products are manufactured in Trostberg. These can differ significantly in their specific waste generation. Relating the total amount of waste to the total production output is therefore not always meaningful. The increase in production-specific waste quantities per tonne of product by 6% compared to the previous year is due to the changed product mix.

The amount of non-production-specific waste, e.g. from construction/demolition activities or municipal waste similar to household waste, decreased to 2,539 t compared to the previous year due to lower construction and demolition activities.

Due to the increased recycling of empty containers, the amount of waste recycled externally again increased significantly by 34% to 7,582 tonnes. It should be noted that waste streams recycled internally at Alzchem do not appear in this list. In total, an additional 1,173 t of waste was recycled internally in the sense of a circular economy and did not have to be disposed of externally.

TRANSPORT TRAFFIC

Transport volume (in t)	2020	2021	2022
Total volume	497,805	577,636	562,002
Street	208,960	231,455	234,026
Rail	262,794	314,255	296,861
Combined	26,051	31,926	31,115

The transport volume of the Trostberg site - a total of 562,002 t in 2022 - has decreased by about 3 % compared to the previous year. This reflects the changed ratio of main products to by-products, as no raw materials need to be purchased for the by-products, for which no transports are then required.

The traffic volume due to production-related delivery traffic breaks down as follows:

In 2022, 52% (previous year 54%) of freight transport was carried by rail and 42% (previous year 40%) by road.

The share of "combined transport" was 5.5% (previous year 5.5%). This mainly involves sea freight containers that are transported by truck to the container handling terminal. From there, they are transported to the respective seaport of departure by rail. Only a very small share of transport performance is air freight.

The expansion of our reporting on CO₂ emissions according to Scope 2 and 3 in the transport sector announced last year could not yet be implemented. The data collection process has not yet been completed.

However, some essential facts have already been collected. For example, all Alzchem vehicles comply with the EURO 6 emissions standard. BIO-LNG, a non-fossil fuel type, is used in 10% of the total fleet.

PASSENGER TRAFFIC

Passenger transport (in km) Trostberg, Schalchen, Hart, Waldkraiburg	2020	2021	2022
Total distance	962,246	1,391,634	1,983,895
Plane	164,478	792,085	1,219,635
Car	750,000	560,000	630,000
Rail	36,108	24,494	105,723
Taxi	11,660	15,055	28,537

The total business travel of Alzchem - in 2022 a total of approx. 1.98 million km - has increased strongly by 43% compared to the previous year, but is still far below the values before the COVID 19 pandemic (approx. 3 million km). This clearly shows that more trade fairs have taken place since the COVID 19 pandemic and that more personal customer contact was possible.

CO₂ emissions from cars used for business purposes, e.g. for driving between locations or to training courses, amount to approx. 38 t CO₂ across all four German locations in the reporting year 2022. Due to the low share of total CO₂ emissions in absolute terms, these CO₂ quantities are not listed under "Emissions" and are mentioned here in writing.

However, it has also been shown that many face-to-face contacts can be replaced by online meetings, thereby permanently reducing the environmental impact of passenger transport.

The steadily increasing number of electric company cars at Alzchem also contributes to a reduction in CO₂ emissions.

The figures shown here refer to all four sites described in this environmental statement, as the data collection is not site-specific.

LAND CONSUMPTION

Land consumption in m ²	2020	2021	2022
undeveloped areas (Gravel areas, lawn, green space, Agric. Area, forest area)	378,031	377,832	377,832
thereof near-natural areas	10,370	122,078	122,078
sealed surfaces	107,775	107,625	107,625
built-up areas	113,127	113,356	113,356
Total area Location	598,933	598,813	598,813

In 2022, no further areas were sealed or built over at the Trostberg site. The proportion of undeveloped areas remains high at 63%.

Some of the undeveloped areas are largely self-sufficient meadows with a very high plant and animal diversity. These areas are deliberately mown twice a year, so that a distinctive biodiversity has been able to develop. In 2021, the so-called "Götzinger-Leite" at the Trostberg site was newly included. The "Götzinger-Leite" is an approx. 11.2 ha large, natural forest area owned by Alzchem, which directly borders the Trostberg plant. Since this piece of forest is only very lightly managed, deadwood is available to highly specialised animal, fungal, lichen and moss species and accounts for the special value of this economically unused forest.

For the entire biodiversity areas of Alzchem, a maintenance plan will be drawn up in 2023 by an expert landscape planner in order to further develop biodiversity in an even more targeted manner.

ENVIRONMENTAL PROTECTION COSTS

In 2022, environmentally relevant investments amounting to approximately € 0.7 million were made at the Trostberg site. The total expenditure for environmental protection operating costs in 2022 was approximately € 17 million.

SCHALCHEN SITE



KEY FIGURES ON ENVIRONMENTAL PERFORMANCE

Key figures Schalchen site		2020	2021	2022
Production output		122.3	144.3	137.8
Environmental indicators				
Use of raw materials	t/t product	0.89	0.89	0.89
Fuel consumption	MWh/t product	0.71	0.63	0.63
Power consumption	MWh/t product	0.18	0.16	0.17
thereof renewable energies	MWh/t product	0.01	0.01	-*)
Water consumption	m³/t product	60.3	55.7	53.6
Waste generation **) (production-specific)	t/t product	0.034	0.025	0.034
thereof dangerous	t/t product	0.034	0.025	0.034
Dust emissions	kg/t product	0.005	0.003	0.004
CO ₂ emissions Scope 1 calculated according to GHG Protocol	t/t product	0.12	0.08	0.09
NO _x emissions	kg/t product	0.06	0.06	0.06
Total area site	m ² /t product	0.62	0.52	0.55
sealed surfaces	m ² /t product	0.33	0.28	0.29
near-natural areas	m ² /t product	0.02	0.02	0.02

*) Value for 2022 not yet available, the share of renewable electricity will only be communicated to Alzchem in the course of the year

**) For the sake of clarity, individual main waste groups are not shown in this table. The main waste groups are presented in more detail in the following tables for the site.

PRODUCTS

Products in t	2020	2021	2022
Total products	122,294	144,280	137,800

The total quantity of manufactured products has decreased by 4% in 2022.

This reduction in volume is mainly due to the decline in all of the products of the site.

RAW MATERIALS, CONSUMABLES AND SUPPLIES

Material in t	2020	2021	2022
Raw materials	108,392	128,804	123,169

The quantities of raw materials used also decreased by 4% compared to the previous year due to the lower production volume. At 0.89 tonnes of raw material per tonne of product, the raw material input is at the previous year's level.

A good half of the raw material is calcium cyanamide, which is procured from the neighbouring Alzchem site in Trostberg. The carbide furnace gas, which is supplied via a long-distance gas pipeline from the Hart site, accounts for about a quarter. The rest comes from bought-in raw materials.

ENERGY

Energy in MWh	2020	2021	2022
Total energy use	108,525	114,592	109,452
Electrical energy	21,705	23,617	22,751
thereof renewable energies	846	779	*)
Carbide furnace gas	79,344	82,613	79,934
Heating oil	7,376	8,204	6,649
Fuel (diesel/petrol)	100	158	118

*) Value for 2022 not yet available, the share of renewable electricity will only be communicated to Alzchem in the course of the year

Total energy use decreased by 4% in absolute terms compared to 2021. With a slight increase in energy efficiency, less product was manufactured. The specific energy input per tonne of product was unchanged from the previous year at 0.79 MWh/tonne.

At 22.8 GWh, the amount of electricity purchased also fell by 4% compared to the previous year, while the specific electricity demand in relation to the quantities produced remained constant compared to 2021 at 0.16 MWh/tonne. No improvement was achieved here due to lower plant utilisation and downtimes during which there was a certain basic consumption without production. Schalchen thus has the lowest electricity intensity of all Alzchem sites.

At the Hart site, carbide furnace gas is produced as a by-product, which is used as a raw material in various productions on the one hand, but on the other hand is also used for energy generation in case of surplus. The amount of carbide furnace gas used for energy generation was 3 % lower in absolute terms than in the previous year. The share of carbide furnace gas in total energy use was increased from 72% in 2021 to 73%.

Heating oil as a further energy source is essentially used when carbide furnace gas is not sufficiently available.

Fuels (diesel and petrol) only have a subordinate share in the energy supply and are still at a low level.

The proof of the share of electricity from renewable sources is not yet available for 2022 and will only be communicated to us in the course of the year. In 2021, the share was a low 3.3%. This is mainly due to the fact that Alzchem, as an electricity-intensive company, takes advantage of a special equalisation scheme under the Renewable Energy Sources Act (EEG) and is particularly dependent on cheap electricity for economic reasons. Due to this equalisation scheme, Alzchem has to pay lower electricity surcharges, but only receives a small share of electricity from renewable sources.

WATER/WASTE WATER

Water in m ³	2020	2021	2022
Service water	7,375,104	8,035,268	7,379,545
Drinking water	1,655	2,124	2,766

Alzchem operates its own wells at the Schalchen site to supply service water. Drinking water is obtained from the public water supplier. The majority of the process water pumped from the company's own wells is used as cooling water, which means that it is not polluted and is discharged directly into the Alz canal.

The total demand for process water was reduced by 8% in 2022. In addition to the lower production volume, a water-saving project in the second half of the year contributed to this in the context of which multiple uses of water and optimised regulations at the water consumers were implemented.

In relation to the production volume, the consumption of process water was reduced by 4% from 62.4 m³/to product in the previous year to 59.9 m³/to product. In the reporting year 2022, 57% (previous year: 61%) of the maximum amount of service water that was set by the authorities was used.

Waste water in m ³	2020	2021	2022
Production and cooling water (direct discharge into Alz canal)	7,318,097	7,962,458	7,296,545
Precipitation water (direct discharge into Alz canal)	39,897	41,301	36,914
Sanitary waste water (Indirect discharge into the municipal sewage treatment plant)	1,731	2,188	2,825

Production wastewater is largely recycled internally. A small part of the waste water is treated internally and discharged into the Alz canal together with the cooling water and precipitation water. Analogous to the lower volumes of industrial water pumped, the volumes of wastewater discharged into the Alz Canal have also declined (-8%).

Pollutant loads in wastewater in kg	2020	2021	2022	Utilisation of limit values 2022 *)
Phosphorus	76	119	86	14 %
Nitrogen anorg. (incl. preload))	17,416	18,880	16,583	25 %

*) The percentage value given in this column indicates the extent to which the approved concentration limits have been exhausted.

The phosphorus load per tonne of manufactured product decreased (-24%) compared to previous years due to lower wastewater volumes and process optimisations. The maximum analysed phosphorus concentration remained at a very low level with an average of 14% of the limit value.

A similar picture emerges for inorganic nitrogen; per tonne of product, the discharge quantity could be reduced by 8 %. The nitrogen concentration remained at a very low level with an average of 25 % of the limit value.

The discharges are regularly sampled and analysed by Alzchem and by the authorities. The limit values defined in the notice for the discharge into the Alz canal were complied with in 2022.

For the discharge into the Alz Canal, the permit at the Schalchen site expires at the end of 2024 and must be reapplied for. For this purpose, as at the Trostberg and Hart sites, the preparation of a water ecology report by external experts was already started at the end of 2019. This will determine the effects of the discharges into the Alz canal on the basis of detailed studies. This report will then be an important basis for the authorities to approve the permissibility and extent of future discharges.

The sanitary wastewater from the site is fed into the municipal wastewater treatment plant of the municipality of Tacherting.

EMISSIONS

Emissions in t (to air)	2020	2021	2022
Dust	0.56	0.48	0.56
Nitrogen oxides (NOx)	6.75	8.15	8.23
Sulphur oxides (SO2)	3.97	1.10	1.21
Ammonia (NH3)	0.98	0.98	0.96
Carbon monoxide (CO)	3.54	3.19	3.09
Carbon dioxide (CO ₂) Scope 1 calculated according to GHG Protocol	14,069	11,348	12,419

Exhaust gases contaminated with pollutants are largely treated via exhaust gas incineration (thermal afterburning - TNV). In addition, local waste gas purification systems such as e.g. exhaust gas scrubbers and filters are used.

The main remaining emissions to air are caused by the waste gases from energy production.

Of particular environmental relevance are dust, nitrogen oxides (NO_x), sulphur oxides (SO_x), ammonia (NH₃), carbon monoxide (CO) and carbon dioxide (CO₂).

Overall, emissions of dust (+17 %), nitrogen oxides (+1%) and sulphur oxides (+10%) and carbon dioxide (+9 %) are above the level of previous years. Slightly lower emissions occurred for ammonia (-2%) and carbon monoxide (-3%).

Exhaust gases from energy production (main component CO₂) are largely not emitted, but used as raw materials in a production plant. This means that approx. 30,000 t CO₂, from energy generation can be recycled directly in production and do not result in emissions.

The partially higher emissions were caused by the lower plant utilisation and downtimes of the plants. Even during these times, the site's basic energy supply must be maintained, while at the same time the waste gases from energy generation cannot be used as raw materials, or only to a lesser extent, and are released as emissions.

NOISE

To the west of the plant is a commercial area. The noise immission guidelines of 65 dB(A) during the day and 50 dB(A) at night must be observed there. The residential area to the north is located in a mixed area. Here, the immission guide values of 60 dB(A) during the day and 45 dB(A) at night are to be complied with.

The values were complied with according to the last measurement, but in one case there was a noise complaint from the neighbourhood.

COMPLAINTS FROM THE NEIGHBOURHOOD

In the reporting year 2022, Alzchem received a noise complaint from the neighbourhood. The cause of this nuisance, which Alzchem could understand, was found on the same day and eliminated in consultation with the nuisance neighbour.

WASTE

Waste in t	2020	2021	2022
Total waste (Production-specific & non-production-specific)	6,572	4,344	5,013
Production-specific waste	4,131	3,645	4,642
thereof aqueous washing liquids and mother liquors *)	3,523	2,964	3,790
thereof halogenated reaction and distillation residues *)	384	519	123
thereof other organic solvents, washing liquids and mother liquors *)	170	118	520
Non-production-specific waste	2,441	700	370
Hazardous waste	5,044	3,665	4,659
Waste for external recovery	4,974	2,980	3,499

*) List of the main waste groups related to "production-specific waste"

The total amount of waste was 15 % higher than in the previous year. In contrast, the amount that was recycled increased by 17 %.

The production-specific waste mainly arises during the separation of the products from the aqueous mother liquor and during product cleaning by washing with water.

In 2022, proportionally more products with higher waste generation were produced. For this reason, both the total amount of production-specific waste and the amount of hazardous waste increased significantly by 27%.

This is reflected in the increase in volume of aqueous washing liquids and mother liquors (+28%) while the volume of filter cakes and absorbent materials overall remained constant.

Measured against total waste, the proportion that could be recycled externally 70% was slightly higher than the previous year (69%) and at a high level. The additional amount of waste recycled internally in 2022 was 1,477 t. This waste was recycled internally at Alzchem and is therefore not included in the waste balance sheet.

The amount of non-production-specific waste decreased again due to the significantly lower construction and demolition activities in 2022 and amounted to 370 tonnes.

TRANSPORT TRAFFIC

Transport volume (in t)	2020	2021	2022
Total volume	199,872	234,931	207,998
Street	31,039	32,932	29,706
Rail	161,556	192,099	170,712
Combined	7,277	9,900	7,580

The transport volume at the Schalchen site in 2022 - a total of 207,998 t - has decreased compared to the previous year, in line with production output (-11%).

The traffic volume breaks down as follows:

At 82% (previous year: 82%), the share of goods traffic handled by rail is pleasingly high; only 14% was handled by truck via road. The share of combined transport was 4 %. This mainly involves sea freight containers that are transported by road to the container handling terminal. From there, they are transported to the respective seaport of departure by rail.

The expansion of our reporting on CO₂ emissions according to Scope 2 and 3 in the transport sector announced last year could not yet be implemented. The data collection for this has not yet been completed.

However, some essential facts have already been collected. For example, all Alzchem vehicles comply with the EURO 6 emissions standard. BIO-LNG, a non-fossil fuel type, is used in 10% of the total fleet.

LAND CONSUMPTION

Land consumption in m ²	2020	2021	2022
undeveloped areas (Gravel areas, lawn, green space, Agric. Area, forest area)	35,342	35,300	35,300
thereof near-natural areas	2,930	2,930	2,930
sealed surfaces	19,390	19,223	19,223
built-up areas	20,500	20,709	20,709
Total area Location	75,232	75,232	75,232

In 2022, no further areas were sealed or built over at the Schalchen site. The share of undeveloped areas remains high at 47%.

The near-natural areas of the site are essentially a meadow with fruit trees and old trees, which, through targeted care, offer a diverse habitat for various animals.

For the entire biodiversity areas of Alzchem, a maintenance plan will be drawn up in 2023 by an expert landscape planner in order to further develop biodiversity in an even more targeted manner.

ENVIRONMENTAL PROTECTION COSTS

In 2022, environmentally relevant investments at the Schalchen site amounting to € 119,000 were made. In total, the environmental protection operating costs were about € 1.8 million.

HART SITE



KEY FIGURES ON ENVIRONMENTAL PERFORMANCE

Key figures Hart site		2020	2021	2022
Production output		124	141	146
Environmental indicators				
Use of raw materials	t/t product	1.48	1.44	1.50
Fuel consumption	MWh/t product	0.01	0.01	0.01
Power consumption	MWh/t product	3.34	3.33	3.30
thereof renewable energies	MWh/t product	0.04	0.05	- *)
Water consumption	m³/t product	77.0	70.8	74.5
Waste generation **) (production-specific)	t/t product	5.80	6.10	3.37
thereof dangerous	t/t product	1.91	1.17	1.72
Dust emissions	kg/t product	0.03	0.02	0.02
CO ₂ emissions Scope 1 calculated according to GHG Protocol	t/t product	0.11	0.10	0.11
NO _x emissions	kg/t product	0.19	0.15	0.14
Total area Location	m ² /t product	2.08	1.83	1.76
sealed surfaces	m ² /t product	1.17	1.02	0.99
near-natural areas	m ² /t product	0.41	0.36	0.34

*) Value for 2022 not yet available, the share of renewable electricity will only be communicated to Alzchem in the course of the year

**) For the sake of clarity, individual main waste groups are not shown in this table. The main waste groups are presented in more detail in the following tables for the site

PRODUCTS

Products in t	2020	2021	2022
Main product (carbide)	123,810	141,044	146,039
By-product (carbidophen gas)	57,525	63,370	62,817

The main product at the Hart site is calcium carbide, which forms the basis for various products in the Alzchem production network. The quantity of calcium carbide produced increased by 4% in 2022.

A by-product of carbide production in Hart is furnace gas, which contains significant amounts of hydrogen (H_2) as well as carbon monoxide (CO). Carbide furnace gas is first purified in several complex stages, then compressed and partly used as an energy source at the site. The majority, however, is transported via a long-distance gas pipeline to the Trostberg and Schalchen sites, where it is used as a synthesis gas – as a raw material, so to speak – and, if there is a surplus, to generate energy. The amount of carbide furnace gas depends on the composition of the raw materials used for carbide production and has fallen slightly by 1% in 2022 compared to 2021.

RAW MATERIALS, CONSUMABLES AND SUPPLIES

Material in t	2020	2021	2022
Raw material	183,205	203,343	219,277

The main raw materials used in Hart are quicklime, coke and coal.

Material efficiency, i.e. the consumption of raw materials in relation to the quantity produced (main and by-product), decreased by 4% in 2022 compared to the previous year. However, this is within the natural fluctuation range of the carbon content of different qualities of coal and coke used for carbide production. Due to the Ukraine–Russia war, the availability of high-quality coal and coke was severely limited in 2022.

ENERGY

Energy in MWh	2020	2021	2022
Total energy use	416,076	472,034	484,834
Electrical energy	413,565	469,864	482,418
thereof renewable energies	4,549	5,638	- *)
Heating oil	1,129	776	995
Fuels (diesel)	639	720	777
Propane	743	674	643
Carbidophen gas (quantity used in the steam boiler)	23,241	22,568	20,327

The fuel quantities for 2020 and 2021 differ from those in the Environmental Statement 2022, as the fuel quantities that were supplied to other site companies in the form of steam were still included here.

The total energy input at the Hart site is determined by the electrical energy used at the carbide furnaces.

Electricity demand increased by about 13 GWh in 2022 due to the higher production volume. However, the specific electricity demand per manufactured tonne of product has decreased to 3.30 MWh/t of product (-%).

Part of the furnace gas produced as a by-product during carbide production is used as an energy source for steam generation at the site. The amount of fossil fuels replaced by this is equivalent to 2 million litres of heating oil. The carbide furnace gas is therefore not included in the total energy consumption.

Other fuels (heating oil/diesel) are used to a lesser extent and are at a level comparable to the previous year.

The proof of the share of electricity from renewable sources is not yet available for 2022 and will only be communicated to us in the course of the year. In 2021, the share was a low 1.2%. This is mainly due to the fact that Alzchem, as an electricity-intensive company, makes use of a special equalisation scheme under the Renewable Energy Sources Act (EEG) and is particularly dependent on cheap electricity for economic reasons. Because of this equalisation scheme, Alzchem has to pay lower electricity surcharges, but only receives a small share of electricity from renewable sources.

483,891,476 kWh of electricity consumption was reported to BAFA for Hart. The difference results from indirect electricity consumption for other companies at the site due to their proportionate supply of steam, compressed air, etc. for the generation of which electricity is also consumed.

WATER/WASTE WATER

Alzchem Trostberg GmbH operates its own industrial and drinking water wells south of the plant at the Hart site in the Alzau region. Water is of great importance for the Hart production facilities: during carbide production, which takes place at very high temperatures, water is needed to a large extent to cool the carbide furnaces.

Three main water pipes, which are supplied from several wells, feed a ring system. This is additionally secured by elevated tanks so that an emergency supply for the kiln cooling is guaranteed even in the event of a power failure.

Water in m ³	2020	2021	2022
Service water	6,916,407	7,387,522	8,334,067
Drinking water	2,613,087	2,593,816	2,543,282

In the reporting year 2022, 64 % of the maximum amount of service water that was set by the authorities was used.

The total water consumption in 2022 was 13% higher than in 2021. The specific water consumption per tonne of manufactured product increased by 5%. The reason for this is that in the first half of the year the furnaces were operated at a higher capacity, but in the second half of the year both furnaces were shut down for several weeks due to the weakening economic situation (Ukraine crisis, electricity prices). Although no carbide was produced during this time, the furnace cooling and thus the water consumption must be maintained to some extent, as the furnaces continue to radiate heat for weeks after being switched off.

The plant's drinking water supply comes from its own wells and via its own pipeline system. For reasons of supply security, there is a drinking water network association between the Hart site and the municipalities of Garching and Unterneukirchen, so that mutual supply is possible in an emergency. Drinking water consumption decreased slightly by 2 % compared to previous years.

Waste water in m ³	2020	2021	2022
Total amount	9,615,429	10,071,068	10,969,585
Cooling water flow-through (direct discharge into the Alzbach)	9,602,802	10,060,207	10,960,150
Sanitary waste water (Indirect discharge via municipal wastewater treatment plant Garching/Alz)	4,887	5,031	5,155
Landfill leachate (Indirect discharge via municipal wastewater treatment plant Garching/Alz)	7,740	5,830	4,280

The majority of the water pumped from the company's own wells is used as cooling water (> 99%), is contaminated below the analytical detection limits and is discharged directly into the Alzbach together with the rainwater.

With an increase of 9 %, wastewater production corresponds to the higher volumes pumped. Production wastewater is generated during carbide production by a so-called sealing water circuit, which is required for safety reasons and which safely separates the carbide furnace gas from the atmosphere in the waste gas system. As a result, dust from the furnace gas enters the sealing water. Although this water is circulated to prevent silting, part of it is continuously discharged and replaced by fresh water. The discharged water is cleaned by filters and then discharged into the Alzbach together with the cooling water.

The site's sanitary wastewater (5,155 m³) is discharged via the sewer system to the municipal wastewater treatment plant, while the landfill leachate (4,280 m³) is also discharged to the municipal wastewater treatment plant in Garching via truck transport. The wastewater treated there is discharged into the Alz. Due to the low loads of the wastewater delivered to the treatment plant, they are not included in the following table.

TOTAL POLLUTANT LOADS FROM DIRECT DISCHARGE OF COOLING

WATER INTO ALZBACH:

Pollutant loads in wastewater in kg	2020	2021	2022	Ausschöpfung Grenzwerte 2022 *)
filterable solids	48,705	21,126	8,794	1.6 %
Nitrogen inorganic	75,376	65,391	57,963	n. r. **)

*) The percentage value given in this column indicates the extent to which the approved concentration limits have been exhausted.

**) n. r. = no officially defined limit value defined

The project to reduce the discharge of polycyclic aromatic hydrocarbons (PAHs) into the Alz which was described in detail in last year's environmental statement, was continued. The separation efficiency of the wastewater treatment of the carbide plant was permanently improved for all filterable solids contained. As a result, the amount of PAHs in Alzchem's wastewater was massively reduced. The effects of this on the total PAH content in the Alz could not yet be conclusively assessed. The investigations carried out by the authorities (bio-monitoring) are still ongoing.

The quality of the discharged water is monitored by daily visual inspections, regular laboratory tests, an online-monitored pH value and a continuously operating oil trace warning device. In addition, the wastewater is regularly analysed by the authorities. The limit values specified in the permit at the discharge point into the Alzbach were complied with in 2022.

For the discharge into the Alzbach, the permit at the Hart site expires at the end of 2024 and must be reapplied for. For this purpose, as at the Trostberg and Schalchen sites, the preparation of a water ecology report by external experts was already started at the end of 2019. This will determine the effects of the discharges into the Alzbach and further into the Alz on the basis of detailed investigations. This expert opinion will then be an essential basis for the authorities to decide on the permissibility and extent of future discharges.

EMISSIONS

Emissions in t (to air)	2020	2021	2022
Dust	3.38	3.37	2.92
Nitrogen oxides (NOx)	9.24	9.32	9.12
Sulphur oxides (SOx)	27.60	27.70	27.10
Carbon dioxide (CO ₂) Scope 1 calculated according to GHG Protocol	13,862	14,482	16,260
Heavy metals in kg	23.25	20.51	20.37

Dust emissions occur during the production of calcium carbide. These are collected by extraction systems and fed into effective filter systems where the dust is separated.

By combining and modernising these dust collection equipment in the carbide production area and an overall more stable operation, among other things with reduced downtimes of the gas cleaning, the dust emissions could be reduced by 13 % compared to 2021 despite an increased production volume.

Continuous dust measurements are installed to permanently monitor compliance with the limit values. In addition, the emission values are regularly checked by discontinuous measurements.

In the reporting year 2022, the continuously monitored dust limit value was not exceeded at any time, neither in the half-hourly mean nor in the daily mean.

Due to the operation of a steam boiler, nitrogen oxides (NO_x) and sulphur oxides (SO_x) are also emitted at the Hart site. In absolute terms, the quantities emitted are at the same level as in previous years. In relation to the amount of carbide produced, emissions of NO_x and SO_x were each reduced by 5 %.

At 0.11 tonnes of CO₂ per tonne of product, the carbon dioxide emissions (CO₂) related to the production volume are at the same level as in previous years.

Heavy metals are only present in the exhaust air below the determination limit of the officially prescribed analysis method. The indicated heavy metal emissions are therefore determined via the actual exhaust air flow with the concentration according to the detection limit. The actual emissions are certainly lower.

NOISE

In 2020, a factory analysis of noise emissions was carried out by external specialists for the Hart site. These investigations showed that although the statutory immission guide values are complied with during the day, they are exceeded at night in the direct vicinity of the plant (Fabrikstraße) at the lower immission guide values that apply at that time. These exceedances are due to the noise emissions of the production facilities and the noise caused by vehicle movements to and from the employee car park.

In order to improve the noise situation, a noise reduction concept was developed together with the commissioned experts and the responsible authorities. This includes a series of noise-reducing measures in the production facilities and at the employee car park. Implementation of the measures began in 2021, and planned measures were also completed in 2022. The entire noise abatement concept is to be implemented by 2025.

COMPLAINTS FROM THE NEIGHBOURHOOD

Alzchem did not receive any complaints in the reporting year 2022.

WASTE

Waste in t	2020	2021	2022
Total waste (production-specific/ non-production-specific)	3,585	2,443	2,327
Production-specific waste	718	861	492
thereof „other tars“ *)	235	165	251
thereof „deposited dust from production“ *)	482	696	240
Non-production-specific waste	2,867	1,582	1,836
Waste for external recovery	2,612	1,307	1,795

*) Listing of the essential main waste group related to "production-specific waste"

Despite increased production volumes, total waste decreased by 5% in absolute terms and by 11% in relation to production volume. This is mainly due to the decrease in dust that was deposited at the site's own landfill.

Production-specific waste is produced as tar residues during the cleaning of oven gas and essentially fluctuates depending on the tar content of the raw materials used. Due to the Ukraine-Russia war, the availability of high-quality coal/coke was very limited in 2022 and other qualities had to be used to maintain production.

Furthermore, filter dusts are produced during carbide production. These are granulated and can largely be used externally as a by-product. A small amount of 240 t in 2022 could not

be disposed of as a by-product and was deposited at the site's own landfill. The amount of dust landfilled was reduced by 66 % compared to the previous year. The fluctuations in the landfilled quantities depend on the demand for this by-product.

The recycling rate in relation to total waste could be significantly increased from 54 % in 2021 to 77 % in 2022.

The amount of non-production-specific waste, which is generated e.g. during construction/demolition activities in the form of track ballast or also municipal waste (waste similar to household waste), has increased by 19 % compared to the previous year – however, the amount is subject to strong fluctuations depending on the construction/demolition activities.

TRAFFIC AND TRANSPORT

Transport volume (t)	2020	2021	2022
Total volume	364,114	398,417	401,577
Street	56,649	59,361	68,655
Rail	307,465	339,056	332,922

The freight transport volume (inbound and outbound transport) increased by 1% in 2022 due to the higher production volumes. As in previous years, the main part of this was transported by rail, with only around 17% of the total transport volume being handled by road. Nothing was transported by air freight. The slight shift from rail to road is due to a generally lower transport capacity in rail transport.

The expansion of our reporting on CO₂ emissions according to Scope 2 and 3 in the transport sector announced last year could not yet be implemented. The data collection for this has not yet been completed.

However, some important facts have already been collected. For example, all of Alzchem's vehicles comply with the EURO 6 emissions standard. BIO-LNG, a non-fossil fuel type, is used in 10% of the total fleet.

LAND CONSUMPTION

Land consumption in m ²	2020	2021	2022
undeveloped consumption (gravel areas, lawn, green space)	59,713	59,713	59,713
thereof near-natural areas	50,150	50,150	50,150
sealed surfaces	62,643	62,643	62,643
built-up areas	81,846	81,846	81,846
Total area site	257,557	257,557	257,557

In 2022, no further areas were sealed or built over at the Hart site. The proportion of undeveloped land remains at 23%.

At the Hart site, too, near-natural areas with a good 5 ha can be designated. These are essentially rough pastures which, among other things, offer a diverse habitat for various insects and other animals through targeted mowing.

For the entire biodiversity areas of Alzchem, a maintenance plan will be drawn up in 2023 by an expert landscape planner in order to further develop biodiversity in an even more targeted manner.

ENVIRONMENTAL PROTECTION COSTS

In 2022, environmentally relevant investments amounting to approximately € 100,000 were made at the Hart site. The total expenditure for environmental protection operating costs in 2022 was approximately € 3.4 million.

WALDKRAIBURG SITE



KEY FIGURES ON ENVIRONMENTAL PERFORMANCE

Key figures Waldkraiburg site		2020	2021	2022
Production output		4.65	6.07	7.43
Environmental indicators				
Use of raw materials	t/t product	1.24	1.22	1.10
Steam consumption	MWh/t product	5.57	5.07	3.83
Power consumption	MWh/t product	1.31	1.04	0.96
thereof renewable energies	MWh/t product	0.02	0.04	-*)
Water consumption	m³/t product	44.8	37.0	35.6
Waste generation **) (production-specific)	t/t product	0.19	0.051	0.039
thereof dangerous	t/t product	0.19	0.048	0.013
Dust emissions	kg/t product	0.004	0.005	0.000
CO ₂ emissions Scope 1 calculated according to GHG Protocol	t/t product	0.016	0.010	0.006
NO _x emissions	kg/t product	0.009	0.006	0.004
Total area site	m ² /t product	0.0037	0.0028	0.0028
sealed surfaces	m ² /t product	0.0025	0.0020	0.0020
near-natural areas	m ² /t product	- ***)	- ***)	- ***)

*) Value for 2022 not yet available, the share of renewable electricity will only be communicated to Alchem in the course of the year

**) For the sake of clarity, individual main waste groups are not shown in this table. The main waste groups are presented in more detail in the following tables for the site

***) no concrete, near-natural areas have yet been designated at the Waldkraiburg site.

PRODUCTS

Products in t	2020	2021	2022
Total products	4,648	6,065	7,429

In the reporting year 2022, the production volume at the Waldkraiburg site was increased significantly by 22%. This was mainly due to the production of a new product.

RAW MATERIALS, CONSUMABLES AND SUPPLIES

Material efficiency, i.e. the consumption of raw materials and supplies in relation to product output, improved by 10% at the Waldkraiburg site in the 2022 reporting period due to the change in the product mix.

Material in t	2020	2021	2022
Raw materials	5,752	7,397	8,142

Alzchem used about 8,100 t of raw materials at the Waldkraiburg site in 2022. 54% of this was supplied by the Alzchem site in Schalchen.

ENERGY

Energy in MWh	2020	2021	2022
Total energy consumption	32,033	37,104	34,339
Steam	25,887	30,772	28,485
Electrical energy	6,076	6,284	5,922
thereof renewable energies	109	277	*)
Fuels	70	48	32
Water (external supply)	74	78	74

*) Value for 2022 is not yet available, the share of renewable electricity will only be communicated to Alzchem in the course of the year.

83% of the total energy consumption at the site is covered by steam. This is generated by a neighbouring company and supplied to Alzchem.

The total energy consumption has decreased significantly both as an absolute value (-7%) and in relation to the quantity produced (-24%). Both the specific steam consumption and the specific electricity consumption fell by 24%. This was mainly due to the more favourable product mix, but also to more efficient energy use with higher plant utilisation.

The administration building is heated in an environmentally friendly way with steam condensate. Natural gas is only needed during maintenance work on the steam or condensate network.

The proof of the share of electricity from renewable sources is not yet available for 2022 and will only be communicated to us in the course of the year. In 2021, the share was a low 4.4%. This is mainly due to the fact that Alzchem, as an electricity-intensive company, takes advantage of a special equalisation scheme under the Renewable Energy Sources Act (EEG) and is particularly dependent on cheap electricity for economic reasons. Due to this equalisation scheme, Alzchem has to pay lower electricity surcharges, but only receives a small share of electricity from renewable sources.

WATER

Water is mainly used as cooling and process water at the Waldkraiburg site.

To make optimum use of the cooling water, Alzchem operates cooling towers at the Waldkraiburg site, which saves about 75% of the cooling water compared to cooling with fresh water. The main supplier of process water is the Waldkraiburg public utility company. Some of the water is extracted from the company's own wells.

As in the previous year, only 17% of the maximum industrial water withdrawal volume set by the authorities was used.

Water in m ³	2020	2021	2022
Service water	208,259	224,290	216,172
thereof from own well	31,998	36,988	40,498
Drinking water (administration building only)	289	238	179

Water consumption has decreased in 2022 in absolute terms (-4%) and in particular in relation to the production volume (-21%). This is mainly due to the change in the product mix.

Waste water in m ³	2020	2021	2022
Not in need of treatment (direct discharge)	172,494	147,727	155,144
Operational waste water (Indirect discharge via municipal wastewater treatment plant)	30,296	30,490	29,652
Sanitary waste water (Indirect discharge via municipal wastewater treatment plant)	2,179	2,158	1,529

The majority of the wastewater produced at the site is unpolluted cooling water (72%), which is discharged directly into the Inn River via the so-called Muna Canal. The volume has increased by 5 % in absolute terms compared to 2021, but has decreased by 14% in relation to the quantities produced.

The amount of waste water from operations has also decreased: by 3% in absolute terms and by 21 % in relation to the production volume. The polluted waste water from the factories and the sanitary waste water are discharged into the municipal sewage treatment plant.

Part of the process water is released into the environment in the form of water vapour through evaporation in the cooling towers and during drying processes.

Pollutant loads to the municipal wastewater treatment plant (in kg)	2020	2021	2022	Utilisation of limit values 2022 *
organic load	20,448	22,217	22,844	n. r. **)
Nitrogen from NO ₃₋ and NH ₄₋	8,130	6,574	5,487	50%

*) The percentage value given in this column indicates the extent to which the approved daily loads were used up.

**) n. r. = no officially defined limit value defined

In absolute terms, the organic wastewater load was at the same level as in the previous year; in relation to the product volume produced, it fell by 16%. Due to the changed product mix and process optimisations, the nitrogen load (ammonium and nitrate nitrogen) also decreased by 32%.

The discharges via the Muna canal as well as the indirect discharges into the municipal wastewater treatment plant are regularly monitored and analysed by Alzchem and by the authorities. The limits set for the discharges were fully complied with in 2022.

EMISSIONS

Emissions to air at the site are very low in absolute terms and in relation to production volumes, and are the lowest of all Alzchem sites.

Emissions in t (to air)	2020	2021	2022
Dust	0.019	0.028	0.003
Nitrogen oxides (NO _x)	0.044	0.035	0.023
Carbon dioxide (CO ₂) (Scope 1 calculated according to GHG Protocol)	73	60	35

The emissions of the plants are monitored by regular measurements. All measurement results were below the limit values to be complied with.

NOISE

In the general residential areas to the north and south-west of the factory premises, the immission guide value is 55 dB(A) during the day and 40 dB(A) at night.

The values were complied with according to the last measurement.

COMPLAINTS FROM THE NEIGHBOURHOOD

As in previous years, there were no environmental complaints from the neighbourhood of the site in 2022.

WASTE

Waste in t	2020	2021	2022
Total waste (production-specific/non-production-specific)	1,075	451	239
Production-specific waste	903	312	110
thereof aqueous washing liquids and mother liquors *)	756	208	0
thereof other filter cakes, used absorbent materials *)	47	36	24
thereof other reaction- and distillation residues	39	34	30,4
Non-production-specific waste	172	140	129
Proportion of hazardous waste	864	292	80
Waste for external recovery	172	141	162

*) List of the main waste groups related to "production-specific waste"

The production-specific waste mainly occurs during the separation of the products from the mother liquor and during product cleaning with water. In 2022, it will still represent the largest share of waste at 110 t. Compared to the previous year, this could be reduced by 65 %. The very strong decrease in production-specific waste compared to 2020 and 2021 can be attributed to the fact that ammonium chloride (group of aqueous washing liquids and mother liquors) was able to be used as a by-product in an application starting in 2021 and completely in 2022 and thus no longer had to be disposed of via the waste route. At this point, Alzchem was able to completely close a material cycle in the sense of the circular economy!

The amount of non-production-specific waste, which mainly consists of municipal waste (commercial waste similar to household waste), decreased by 8% compared to the previous year to 129 t.

After the elimination of aqueous washing liquids and mother liquors through the use of ammonium chloride as a by-product, the proportion of hazardous waste was also reduced again by a very high 73 % compared to the previous year.

Of the remaining 239 tonnes of waste, 162 tonnes could be recycled and only 77 tonnes had to be disposed of. The recycling rate of the total waste could thus be more than doubled compared to 2021 (+217%).

TRAFFIC AND TRANSPORT

Transport volume (t)	2020	2021	2022
Total	10,587	11,344	11,542
Street	8,425	9,163	7,893
Rail	168	108	132
Combined	1,994	2,073	3,517

In 2022, the total absolute transport volume of 11,542 t was at the same level as the previous year. In relation to the quantity of products manufactured, transports were reduced by 17 %.

The total volume of traffic at the Waldkraiburg site breaks down as follows: 68 % road (previous year 81 %), 1 % rail (previous year 1 %) and 31 % "combined" (mainly road and rail - previous year 18 %). The still high share of road transport is due to the large number of small delivery quantities that are transported as so-called general cargo by truck. In addition, the raw materials from the Schalchen plant can only be delivered by road.

The expansion of our reporting on CO₂ emissions according to Scope 2 and 3 in the transport sector announced last year could not yet be implemented. The data collection for this has not yet been completed.

However, some essential facts have already been collected. For example, all Alzchem vehicles comply with the EURO 6 emissions standard. BIO-LNG, a non-fossil fuel type, is used in 10% of the total fleet.

LAND CONSUMPTION

Land consumption in m ²	2020	2021	2022
undeveloped areas (gravel areas, lawn, green space)	5,296	5,296	5,296
sealed surfaces	4,988	4,988	4,988
built-up areas	6,844	6,844	6,844
Total area site	17,128	17,128	17,128

There have been no changes in the use and land consumption of the site in the years 2020 to 2022.

The key figures for this remain unchanged: sealed areas 29 %, built-up areas 40%, undeveloped areas 31%.

ENVIRONMENTAL PROTECTION COSTS

The total expenditure for environmental protection operating costs at the Waldkraiburg site in 2022 was approx € 230,000.

IMS programme and target achievement

In the update to the IMS programme 2021–2023, a total of 39 new goals and the associated measures were defined. The new goals and measures include the topics of environment, energy, quality and safety.

To give you an impression of the extent to which these goals and measures are defined at Alzchem, you will find an excerpt from the update of the IMS programme 2021–2023 below:

NEW TARGETS AND MEASURES – TROSTBERG SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Biodiversity	T	Optimisation of biodiversity in the designated near-natural areas of the sites	4 Q 2023
	M	Preparation of preservation plans by external expert planner	
Energy	T	Reduction of the electricity demand in the air separation plant by 100 MWh/a	2 Q 2023
	M	Replacing the drive of a compressor with a new, more energy-efficient one.	
Waste	T	Increase reuse of used pallets by 4,000 pcs.	1 Q 2023
	M	Reuse of used raw material pallets from one plant for products from another plant	
Water	T	Reduction of the cooling water volume of the cyanamide plant by 400,000 m ³ /a	4 Q 2023
	M	Targeted optimisation of operating parameters of the cooling water consumers of the cyanamide plant	
Energy	T	Energy savings of 150 MWh/a in the cyanamide plant	4 Q 2023
	M	Reduction of the pressure of the cooling water pumps	
Energy	T	Saving of primary energy (steam) by increasing the capacity of the heat recovery by 20 MWh/d	4 Q 2023
	M	Connection of a further rotary kiln to the heat recovery system (HRU) to supply the hot water plant network	
Water	T	Savings of 2.5 million m ³ /a of cooling water from well production	4 Q 2023
	M	Multiple use of the outgoing cooling water by installing a recirculation pump and connecting it to the water network	

NEW TARGETS AND MEASURES - SCHALCHEN SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Water	T	Cooling water savings in the DCD plant of 1.5 million m ³ /a	4 Q 2023
	M	Optimisation of cooling water consumption at the slurry, the rotary filter and crystallisation	
Energy	T	In one area of the DCD facility, the electricity consumption of the lighting is to be reduced by 6 MWh/a	4 Q 2023
	M	Installation of LED light	
Energy	T	In a warehouse, the electricity consumption of the lighting system is to be reduced by 2.5 MWh/a	3 Q 2023
	M	Installation of LED light	

NEW TARGETS AND MEASURES - HART SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Energy	T	In an administrative building, the electricity consumption of the lighting is to be reduced by 9 MWh/a	1 Q 2023
	M	Installation of LED light	
Water	T	Reduction of cooling water consumption at a carbide furnace by approx. 1,680,000 m ³	4 Q 2023
	M	Targeted multiple use to reduce cooling water consumption	

NEW TARGETS AND MEASURES - WALDKRAIBURG SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Water	T	Reduction of water consumption in a production plant	1 Q 2023
	M	Through the automated control of the sealing water of the vacuum pumps, consumption is to be reduced by 227 m ³	

IN THE REPORTING YEAR 2021, VARIOUS GOALS AND MEASURES WERE PLANNED, PROCESSED AND COMPLETED. THE FOLLOWING IS AN EXCERPT FROM THE TARGETS AND MEASURES DEFINED FOR 2021 AT ALZCHEM:

GOALS WORKED ON AND MEASURES IMPLEMENTED IN 2022 - TROSTBERG SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Energy	T	Reduction of the internal energy demand of the central wastewater treatment plant by 500 MWh/a	done
	M	Thermal use of biogas (installation of a gas boiler) for energy production	
Energy	T	Reduction of energy demand in the plant's steam generation by 400 MWh/a	done
	M	Installation of a condensate pump and integration into the return line to the boiler house	
Biodiversity	T	Increase the biodiversity areas by expanding the near-natural areas of the Alzchem by 10 hectares	done
	M	Inclusion of the "Getzinger-Leite" and the "Altdeponie Benetsham" in Alzchem's biodiversity programme.	
Waste	T	Reduction of aqueous waste from the nitrile plant by 500 t/a	done
	M	Installation of more accurate quantity records for feed	

Energy	T	Energy savings of 20 MWh/a in the KA-Plant by reducing cooling water consumption.	done
	M	Installation of a more efficient heat exchanger for aftercooling.	
Energy	T	Reduction of electricity consumption in the cyanamide plant by 3 MWh/a	done
	M	Installation of an energy-efficient laser measurement and decommissioning of A-coal trace heating.	
Energy	T	Reduce electricity consumption of plant lighting at the cyanamide plant by 10 MWh/a	done
	M	Installation of LED	
Energy	T	Reduction of energy consumption of the GMP plant by 500 MWh/a	done
	M	Avoidance of heating and cooling processes by switching from batch operation to continuous operation	

GOALS WORKED ON AND MEASURES IMPLEMENTED IN 2022 – SCHALCHEN SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Process	T	Recovery of > 95 % dicyandiamide (DCD) from the vapour condensate of the DCD plant's critical installation	done
	M	Installation of droplet separators for the recovery of DCD	
Process	T	Improvement of the raw material dosing of the Gusa	done
	M	Due to an actual lower product demand, the measure was not realised	
Energy	T	Reduction of electricity consumption in the area of the compressed air station at the Schalchen site by 150 MWh/a	done
	M	Replacement of the existing piston compressors with energy-efficient screw compressors	

GOALS WORKED ON AND MEASURES IMPLEMENTED IN 2022 - HART SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Occupational safety	T	Increasing occupational safety in the tapping area of a carbide furnace	Partially realised
	M	The originally planned enclosure of an operator's station at the carbide furnaces was not pursued further, as another solution (new tapping machines) is planned in the meantime to improve occupational safety.	
Energy	T	Reduce the electricity consumption of the lighting in the CA sorting and bottle storage hall by 100 MWh/a	done
	M	Installation of LED lamps	
Noise	T	In the area of the raw material extraction of the carbide plant, noise emissions are to be reduced by 2 dB(A)	done
	M	Replacement of a raw material conveyor with a quieter version	

GOALS WORKED ON AND MEASURES IMPLEMENTED IN 2022 - WALDKRAIBURG SITE

Subject	Target/Measure	Target/measure formulation	Deadline
Energy	T	Reduction of the energy consumption of the NQ filtration by 40 MWh/a	done
	M	Installation of an automatic temperature control for the cooling agitators	

DECLARATION OF COMPLIANCE WITH LEGAL REGULATIONS (TA-LUFT , BIMSCHV,...)

Alzchem Trostberg GmbH complies with the relevant legal regulations with regard to its significant environmental impacts. Particularly relevant legal regulations are the Federal Immision Control Act with its ordinances, such as the Major Accidents Ordinance (12. BlmSchV), the Ordinance on the Incineration and Co-incineration of Waste (17. BlmSchV) or the Ordinance on Evaporative Cooling Plants, Cooling Towers and Wet Separators (42. BlmSchV), the Technical Instructions on Air Quality Control (TA Luft), the Water Resources Act with its ordinances, such as the Waste Water Ordinance (AbwV) or the Ordinance on Installations for the Handling of Substances Hazardous to Water (AwSV) and various laws and ordinances on waste law, such as the Closed Substance Cycle Waste Management Act (KrWG) and the Landfill Ordinance (DepV) and on nature conservation law. In order to implement compliance with the legal provisions, we are constantly developing our system for tracking regulations.

EMAS Certificates



Outlook

DATE OF THE NEXT ENVIRONMENTAL STATEMENT

The Trostberg site successfully participated in the eco-audit regulation for the first time in 1997. Parallel to the validation of the Environmental Statement 2021, Alzchem's integrated management system was again audited in accordance with the standards DIN EN ISO 9001, ISO 14001, ISO 27001, ISO 27019 and ISO 50001.

The validation and audits were carried out by TÜV SÜD Umweltgutachter and Management Service GmbH respectively.

In 2024, Alzchem will prepare an updated environmental statement.

In 2025, Alzchem will prepare a consolidated environmental statement.

Trostberg, March 31, 2023

Klaus Englmaier

Management Production & Technology

Trostberg, Schalchen, Hart und Waldkraiburg

DECLARATION OF THE ENVIRONMENTAL VERIFIER ON THE VERIFICATION AND VALIDATION ACTIVITIES

The EMAS environmental verifier, Dipl.-Biol. Lennart Schleicher, with the registration number DE-V-0404, accredited for the scope 20.1 (NACE code), confirms to have verified whether the sites

- Trostberg, Dr.-Albert-Frank-Str. 32, 83308 Trostberg (Reg.No. DE-155-00034)
- Schalchen, Trostberger Strase 95, 83342 Tacherting (Reg.No. DE-155-00034)
- Hart, Fabrikstrasse 2, 84579 Unterneukirchen (Reg.No. DE-155-00083) and
- Waldkraiburg, Beuthener Strase 2, 84478 Waldkraiburg (Reg.No. DE-155-00034)

as stated in the German language environmental statement of the organization Alzchem Trostberg GmbH, Dr.-Albert-Frank-Str. 32, 83308 Trostberg with the registration number DE-155-00034 specified, all requirements of Regulation (EC) No. 1221/2009 of the European Parliament and of the Council of 25. November 2009, updated by Regulation (EU) 2017/1505 and Regulation (EU) 2018/2026 on the voluntary participation of organizations in a Community Eco-Management and Audit Scheme (EMAS) are met.

The German language environmental statement, verified by Dipl.-Biol. Lennart Schleicher, was subsequently translated into English. A separate verification of the English environmental statement did not take place

Imprint

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