

alzchem
group



FOR THE TROSTBERG, SCHALCHEN,
HART, WALDKRAIBURG SITES

ENVIRONMENTAL STATEMENT 2022



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FOREWORD

Dear Reader,

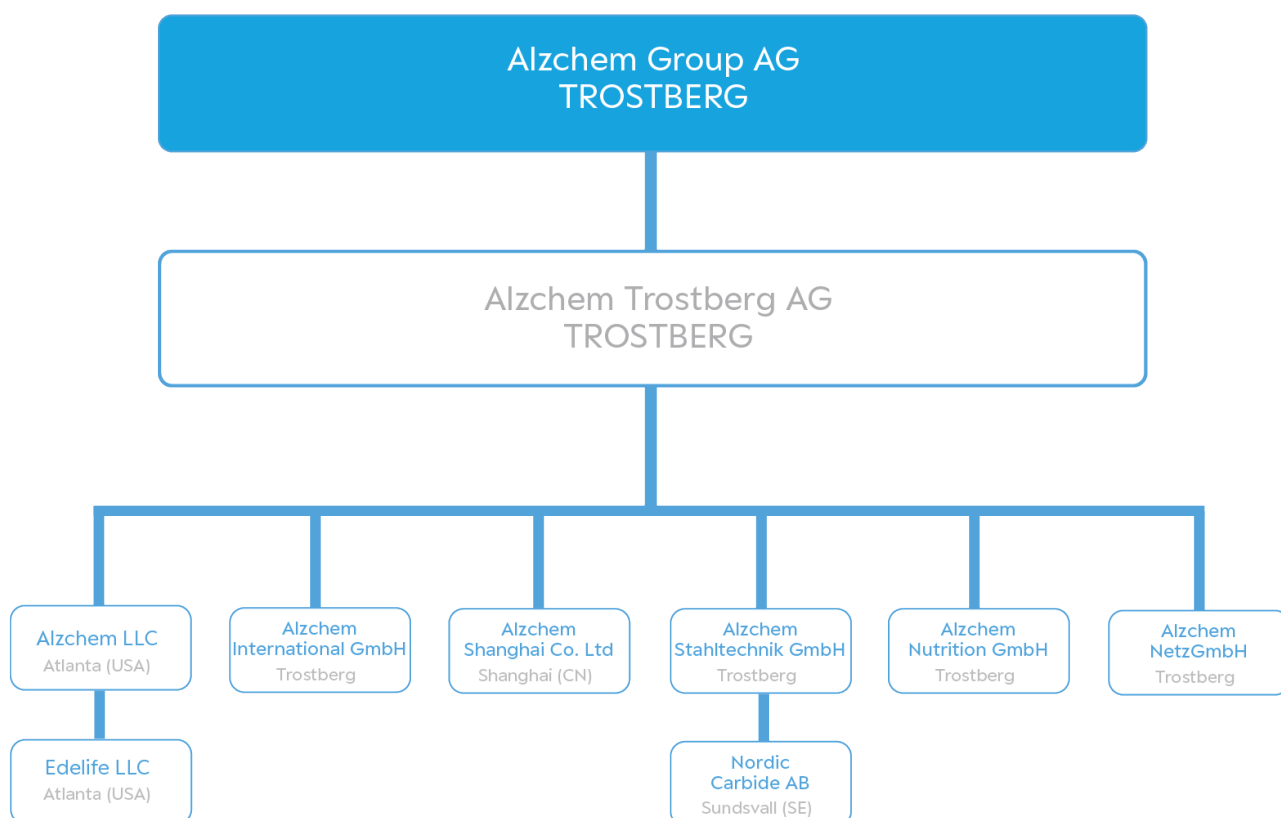
Alzchem is a globally active speciality chemical company that is predominantly among the market leaders in its fields of activity. Four very different global developments play an important role: climate change, population growth, longer life expectancy and sustainability. Alzchem products can contribute effective solutions to the resulting societal 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. In view of population growth, efficient food production is a crucial issue. Pharmaceutical raw materials and our creatine products can contribute to healthy aging as life expectancy increases. Alzchem supports the goal of sustainability, which is becoming particularly virulent as a result of climate change, in the area of renewable energies; in addition, sustainability is also an important concern for us in our day-to-day business. The Fine Chemicals and Metallurgy business units offer equally great prospects.

Alzchem Group AG's broad product range includes dietary supplements, precursors for corona tests and pharmaceutical raw materials. These products are our company's response to global trends and developments. Alzchem is ideally positioned in this area and sees itself as well prepared for a sustainable future and further global developments.

The company employs around 1,630 people at four production sites in Germany and one plant in Sweden, as well as at two sales companies in the USA and China. In 2021, Alzchem generated consolidated sales of around EUR 422.3 million and EBITDA of around EUR 62.0 million.

THE ALZCHEM GROUP:



OUR VISION

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

Our production processes are based on electricity and not on petroleum. 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 – so our products will.

For us, sustainability is part of our corporate strategy. It serves us as a guidepost for a successful future.

A high level of transparency in all environmental matters is very important to us. That is why we have been EMAS-certified (Eco-Management and Audit Scheme, also known as the EU Eco-Audit) since 1997 and have been a founding member of the first Bavarian Environmental Pact and its successor, the Bavarian Environmental and Climate Pact, since 1995.

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 the Environmental Statement 2022 now available, Alzchem publishes its key figures for the Trostberg, Schalchen, Hart and Waldkraiburg sites and presents the current "Integrated Management Program".

Your Executive Board of Alzchem Group AG



Andreas Niedermaier, CFO



Klaus Englmaier, COO



Dr. Georg Weichselbaumer, CSO



f. l. t. r.:

Klaus Englmaier (COO)

Andreas Niedermaier (CEO)

Dr. Georg Weichselbaumer (CSO)

SUSTAINABILITY

ENVIRONMENTAL PROTECTION

Our main goals in environmental protection are the reduction of energy consumption, the reduction and avoidance of waste, the protection of water as well as immission and noise protection. Our current environmental program with clearly defined goals and measures can be found on a site-specific basis in the Environmental Statement published here, which can also be viewed on our website www.alzchem.com in the "Quality & Environment" section.

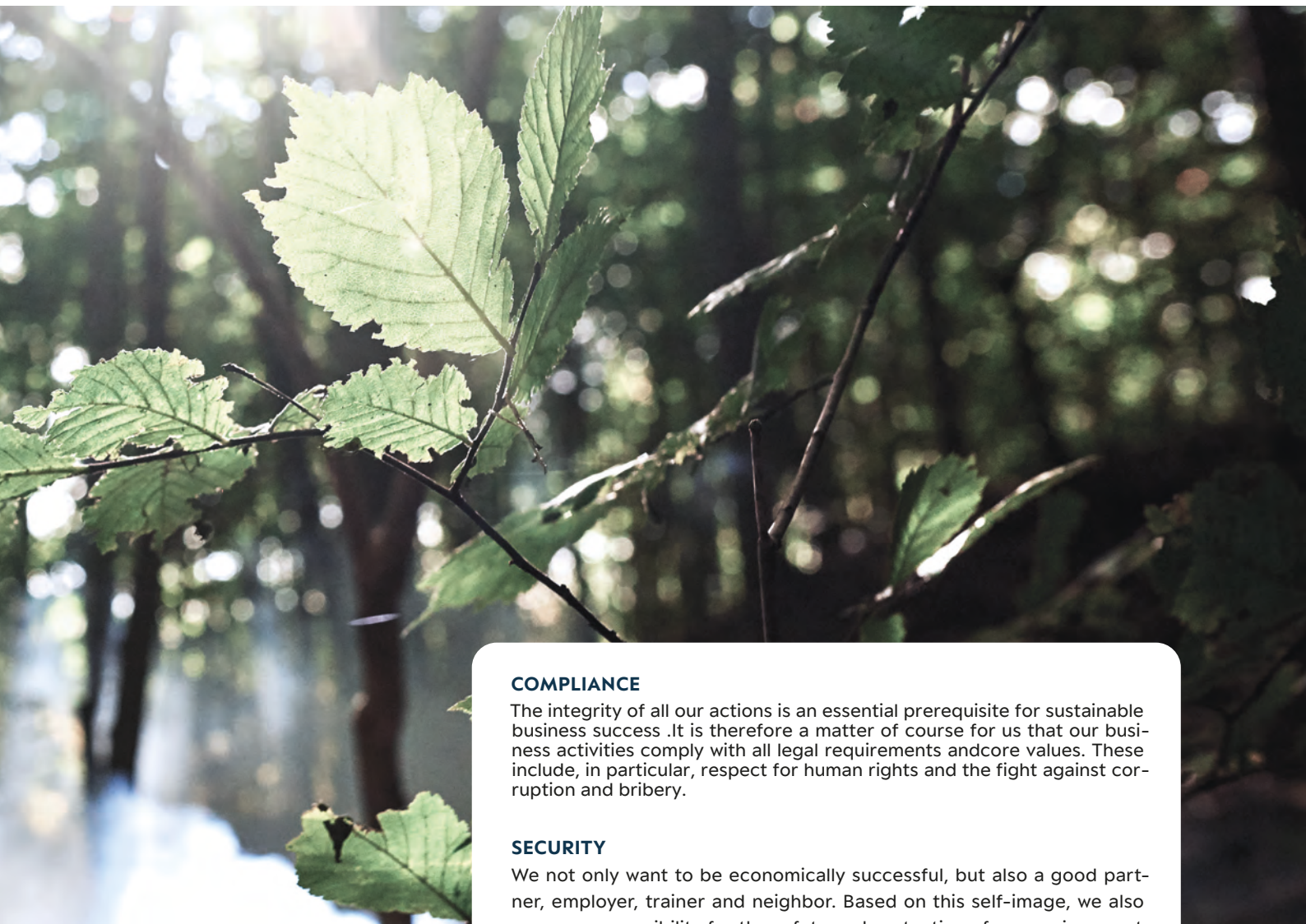
EMPLOYEE MATTERS

Our employees are the key to our sustainable success. That is why we are particularly keen to offer them a stable and interesting work environment: through flexible working hours, attractive compensation, job security, health management with the "gesund punkten..." campaign, idea management and company pension schemes. We were also able to offer our employees and their families vaccinations during the COVID-19 pandemic.

SOCIAL BALANCE

As a company with regional roots, we take responsibility, especially in the immediate vicinity of our sites. We promote children's and youth projects, support school projects and are a member of the non-profit association for the promotion of education and entrepreneurship in Germany, the Wissensfabrik. In this way, we make our contribution to social solidarity.

ACT NOW.



COMPLIANCE

The integrity of all our actions is an essential prerequisite for sustainable business success. It is therefore a matter of course for us that our business activities comply with all legal requirements and core values. These include, in particular, respect for human rights and the fight against corruption and bribery.

SECURITY

We not only want to be economically successful, but also a good partner, employer, trainer and neighbor. Based on this self-image, we also assume responsibility for the safety and protection of our environment. Through appropriate plant and occupational safety, information security, IT compliance and legal conformity – elementary components of responsible corporate action.

DELIVERY CHAIN

Corporate social responsibility is also a high priority in our supply chain. For this reason, we have undergone an independent CSR rating by the global assessment platform EcoVadis. In addition, in the area of purchasing/supplier approval, we ensure that company-wide standards are met in the procurement of our raw materials.

ACT TOGETHER.

THE INTEGRATED MANAGEMENT SYSTEM (IMS) OF ALZCHEM

ALZCHEM HAS IMPLEMENTED THE FOLLOWING KEY MANAGEMENT SYSTEMS:

- EMAS III (Environmental Management)
- ISO 14001 (Environmental Management)
- ISO 9001 (Quality Management)
- ISO 50001 (Energy Management)
- ISO 27001 (Information Security Management)
- OHRIS (Occupational health and safety Management)
- EfB (Waste disposal Management)
- ECM (Railway Maintenance Management)
- FAMI-QS (Feed Quality Management System)
- IFS (Food Quality Management System)

The Integrated Management System (IMS) combines management systems from different areas - environmental protection, quality, safety, energy, information security - in a uniform structure.

The basic principles of our IMS are described in a manual. The design and detailed regulation of these central requirements takes place at the lower level of the procedural instructions, which are binding for their respective areas of application. The last level contains the specific implementation at plant and area level in the form of operating and work instructions. The IMS manual and the procedural instructions are published on the Alzchem intranet and are therefore available to all employees at all times.

To support the management system, Alzchem has installed a Central Management System Officer, who also performs the function of Central Environmental Officer. In these functions, he coordinates the work of the persons assigned to the individual subareas. In addition to the legally required officers, e.g. in the areas of immission control, water protection, occupational safety, hazardous substances and waste management, who are appointed for each site, Alzchem employs further officers for the areas of quality, energy, information security, data protection and compliance, among others.

In addition, there are company environmental and energy officers for all relevant areas.

The officers monitor the implementation of both statutory and more extensive internal requirements in their respective areas of responsibility and advise the organization on the relevant topics. They are supported by modern IT solutions such as the environmental database in which, among other things, all results of environmentally relevant measurements are documented.

The officers prepare reports at regular intervals, which are discussed with the company management. The reports also form the basis for Alzchem's management review, in which the suitability, effectiveness and performance of the IMS are assessed annually and, if necessary, targets and measures for the IMS program are derived.

For the entire Integrated Management System, there is a superordinate control loop with target definitions and measures from all its areas. These are mapped in an IMS program, which is published. The achievement of objectives is monitored on a regular basis. Thus, a continuous improvement process is installed.



In addition to regular audits by external certification organizations, Alzchem carries out around 60 internal audits each year with around 30 of its own auditors. All areas of the company are audited for compliance with the requirements of the IMS. Measures are defined for weaknesses identified in the process, which are also included in the control loop.

POLICY IN THE INTEGRATED MANAGEMENT SYSTEM (IMS POLICY)

Alzchem is aware of its responsibility towards its employees and the public. For this reason, the company has drawn up guidelines that are anchored as principles in the integrated management system.

The corporate policy and the specifications of the integrated management system are published on the Alzchem intranet, available to all employees and binding for them.

ENVIRONMENT

Alzchem is a founding member of the first Bavarian Environmental Pact and participates in the current Bavarian Environmental and Climate Pact. Likewise, the company has been voluntarily certified in accordance with the EMAS regulation (EC eco-audit) since 1997. We have committed ourselves to following the guidelines of the chemical industry's worldwide "Responsible Care" initiative.

OUR GUIDELINES

We are committed to complying with all applicable legal requirements of environmental law. In addition, we provide further voluntary services to protect the environment.

Responsible and committed to protecting the environment, we work continuously to sustainably reduce the environmental impact of our business activities.

We openly and transparently communicate the company's environmental performance.

We inform and support our customers with regard to the safe and environmentally sound handling of our products beyond their life cycle.

Action plans drawn up for emergencies and regular emergency drills reduce possible effects in the event of an emergency. The concerns of the neighborhood and employees are given priority.

Our integrated management system always fulfills the requirements of DIN EN ISO 14001 and EMAS III and is continuously developed and improved.

ENERGY

As a very energy-intensive company, it is extremely important for Alzchem to use energy sparingly and efficiently.

OUR GUIDELINES

Our energy management system is based on a continuous improvement process. We are committed to reducing the specific energy consumption in the company in the long term and to reducing the energy-related environmental impact. We provide the necessary resources and information for this purpose.

We review and evaluate our energy targets, energy-related performance and action plans in regular internal reviews.

We are committed to complying with all legal requirements applicable to us in connection with energy efficiency and energy consumption.

We support the procurement of energy-efficient products, raw materials and services with an impact on energy-related performance. When designing new processes, plants, equipment, etc., we pay attention to improving energy-related performance.

We develop innovative products that enable a technological contribution to energy efficiency and climate protection in our society.

Our integrated management system always meets the requirements of DIN EN ISO 50001 and is continuously developed and improved.

SAFETY AND HEALTH

Alzchem accepts the challenge of constantly working to improve the safety and health of all its employees.

OUR GUIDELINES

The safety and health of our employees are our most important assets.

We establish procedures in our management structures that continuously optimize safety and health.

At our workplaces, systematic risk assessments form the foundation for the safe manufacture of our products and services.

"If we cannot perform a job safely, we do not perform it". This maxim also applies to our contractors.

Our integrated management system always meets the requirements of the OHRIS safety management system. It is continuously developed and improved.

SUSTAINABILITY

Only sustainable companies will be successful in the future. We are convinced that Alzchem products can make a significant contribution to this.

OUR GUIDELINES

We believe in and live the intergenerational contract and share a social responsibility for this. The balancing of economic, ecological and social concerns is an integral part of our corporate policy.

We are helping to transform the economy and global value chains toward a more sustainable world.

The value of our company is not based solely on our economic success. The social responsibility of our actions in the sense of corporate responsibility also makes a significant contribution.

We are guided by the 17 Sustainable Development Goals of the United Nations and make our contribution to achieving these goals. In this way, we create added value for society and the company.

Sustainability serves as our guide to a profitable future.

OUR CONDUCT IN THE INTEGRATED MANAGEMENT SYSTEM

Management regularly monitors the effectiveness of the Integrated Management System and ensures alignment with the strategic approach and business processes.

The importance of effective management and the importance of meeting the requirements of the Integrated Management System (IMS) are communicated to the workforce. The company's management promotes a culture of continuous improvement - also in the company's management structures.

Compliance with legal regulations in the development, manufacture and marketing of all our products is a self-evident obligation. However, internal regulations may go beyond this. We also analyze our activities with regard to their social impact. Our sites and facilities must generate sustainable benefits for the community.

All employees, in particular managers, are obliged to comply with the stipulations made within their area of responsibility. Each supervisor must ensure and monitor compliance with these requirements.

We promote dialog with our stakeholders and provide factual and open information both internally and externally about our successes, but also about problems.

We cooperate with the authorities openly and in mutual trust and actively participate in the design of practical public-law regulations.

ENVIRONMENTAL ASPECTS AND IMPACT

The industrial production of chemicals at the Trostberg, Schalchen, Hart and Waldkraiburg sites has a particular impact on the following environmental aspects:

- **Energy consumption**

The consumption of energy from electricity, natural gas and other energy sources ultimately emits climate-damaging CO₂.

- **Water consumption**

Water is one of our most valuable goods. It is important to use this resource sparingly and carefully in order to have sufficient quantities available to supply the population in the future as well.

- **Waste generation**

Waste can have various effects on the environment. On the one hand, waste is no longer available as a raw material for the manufacture of our products, so new resources have to be used. For another, the incineration of waste produces climate-damaging CO₂.

- **Emissions to air**

Emissions, depending on their nature and quantity, can have severe effects on humans as well as on animals and plants.

- **Emissions to water bodies**

The discharge of pollutants into water bodies can damage them as habitats for animals and plants. In addition, there is a risk that groundwater will be contaminated and the drinking water supply endangered.

- **Soil and contaminated sites**

Soil contamination from historical landfill deposits can lead to the contamination of water bodies or groundwater and thus also damage the habitat of animals and plants or restrict the possible use of the areas. Alzchem is currently having various old landfill sites investigated by external experts. The aim is to determine the possible effects of these areas on the environment or to rule them out.

These environmental impacts are compiled and evaluated within Alzchem at regular intervals, taking into account data trends and compliance requirements.

In this process, the direct and indirect environmental aspects and their effects on the environment are systematically determined for Alzchem's activities at all sites. Subsequently, the effects at the respective site are evaluated according to defined criteria such as extent, severity and frequency. In this way, the most significant environmental impacts are determined in each case, which are presented in this Environmental Statement on a site-by-site basis.

PRODUCT RESPONSIBILITY

As a globally active company, Alzchem is dependent on a large number of approvals, registrations and permits. It cannot be ruled out that approvals will be limited or revoked, for example as a result of political movements. Alzchem employs its own approval experts and works together with local experts for each market and application. These continuously evaluate the environmental impact of our products."

CO₂ -ACCOUNTING IN THE ENVIRONMENTAL STATEMENT

To ensure even greater transparency and comparability of Alzchem's reported CO₂ emissions, we have decided to report them with immediate effect on the basis of the globally recognized Greenhouse Gas Protocol (GHG Protocol) determination and accounting system.

The CO₂ data in this Environmental Statement refer to the direct emissions of the sites according to the so-called Scope 1. Scope 1 includes emissions from stationary combustion (e.g. steam generation) and mobile combustion (e.g. diesel forklifts) as well as emissions from production processes. Also included are CO₂ sinks, such as the use of CO₂ as a raw material in DCD production in Schalchen.

In each case, the entire site under consideration forms the balance sheet framework.

The data for the years 2019 and 2020 have been recalculated and also comply with the requirements of the GHG Protocol with regard to the emission factors and the data sources used.

In subsequent years, we will also determine and report CO₂ emissions from external energy purchases (Scope 2) and other emissions associated with our products and services (Scope 3).

SPECIFIC IMPROVEMENTS IN ENVIRONMENTAL PERFORMANCE

NATURAL AREAS

Alzchem has many properties with distinctive natural vegetation. These areas are considered with regard to their species composition and optimal maintenance in terms of the highest possible biodiversity.

Among other things, these are areas that are not fertilized, but mowed regularly, so that predominantly plant communities can be found here that are satisfied with a nutrient-poor soil – also called rough grassland or semi-rough grassland in botany. Here you can find a high density of flowers, which is otherwise not so easy to find in nature. A good example is the western flank of the landfill in Hart with approx. 0.8 hectares (= 8,000 m²), which for a good ten years now, especially in the months of June and July, has given rise to a great flowering splendor, among other things with kidney vetch, true bedstraw and common thyme. But rarer species such as the Scheuchzers bellflower and the meadow sage are also at home there. In good weather, countless insects such as bumblebees, honeybees and wild bees are on the move here.

In addition, the "Götzinger-Leite" at the Trostberg site also deserves special mention. The "Götzinger-Leite" is a natural forest area of around 11.2 hectares directly adjacent to the Trostberg Chemical Park. Since this piece of forest is not intensively managed, deadwood, for example, is available to highly specialized species of animals, fungi, lichens and mosses and accounts for the special value of this economically unused forest.

A total of about 17.5 hectares (= 175,000 m²) at the Trostberg, Schalchen and Hart sites of Alzchem Trostberg GmbH have been investigated in recent years with regard to their biodiversity and can be designated as near-natural areas.



Figure 1: An umbel visited by a red-yellow soft-bodied beetle and a honey bee, Schalchen site, 2020.



Figure 2: Raubett with oxeye, common thyme, Carthusian nettle and small-flowered mullein (west flank, Hart landfill 2021).



Figure 3: Deadwood at the Götzinger Leite 2021



Figure 4: Deadwood at the Götzinger Leite 2021

ELECTROMOBILITY

Electromobility is a key to climate-friendly mobility worldwide. The operation of electric vehicles generates significantly less CO₂, especially when combined with renewably generated electricity. It is an important element for a climate-friendly industrial, transport and energy policy. It offers the opportunity to reduce dependence on petroleum-based fuels.

A basic prerequisite for the breakthrough of electromobility is the expansion of the charging infrastructure, which is why the necessary charging infrastructure for "refueling" vehicles has already been provided on Alzchem's premises. Last year, a total of 21 charging points were created at the Trostberg, Schalchen and Hart sites: 15 in Trostberg, two in Schalchen and four in Hart. Further charging points are planned for the coming years. To encourage as many employees as possible to rethink this area, our charging points are available to all employees free of charge until further notice.

NEW REGENERATIVE THERMAL OXIDATION (RTO PLANT)

In 2017 and 2018, the emission situation in calcium cyanamide and CaD production at the Trostberg site was investigated and evaluated with the help of an extensive measurement program in close coordination with the responsible authorities. Based on the findings of this measurement program, an exhaust air treatment plant using regenerative thermal oxidation (RTO plant) was projected. This type of waste gas treatment is also suitable for waste gas streams from other production plants, which can also be centrally cleaned here according to the state of the art. The existing waste incineration plant (AGV) can thus be significantly relieved.

The RTO system essentially consists of the regenerative afterburner (RTO, see following figure) and the catalyst unit (SCR) in the exhaust stack.

REGENERATIVE AFTERBURNING (RNV)

In the RNV unit, the exhaust gases generated in the productions that contain combustible pollutant components are cleaned in accordance with the legal requirements. This type of exhaust air purification is a particularly resource-saving process, since the low energy requirement for the thermal oxidation that takes place there can usually be completely covered by the calorific value of the exhaust air pollutants (autothermal plant operation). To make this possible, three highly effective ceramic heat accumulators are used for exhaust gas preheating.

Functionality:

- The pollutant-laden exhaust gas first flows through a hot ceramic heat accumulator A and is heated to oxidation temperature. During this process, the heat accumulator A cools down.
- After this exhaust gas preheating, the pollutants are oxidized at $> 850\text{ }^{\circ}\text{C}$ in the combustion chamber. This oxidation reaction (thermal afterburning) releases additional heat and thus leads to a further increase in the exhaust gas temperature.
- The exhaust gas cleaned in this way leaves the combustion chamber and flows through a second ceramic heat accumulator B. Here it is cooled down to approximately the exhaust gas inlet temperature, with the thermal energy being transferred to the ceramic heat accumulator B. This heat accumulator can be used in the subsequent cycle for exhaust gas preheating. This heat accumulator can be used for exhaust gas preheating in the subsequent cycle.
- In a third ceramic heat accumulator C, which was used for exhaust gas preheating in the previous cycle, the contaminated exhaust gas still in the heat accumulator is purged and fed to the exhaust gas stream upstream of the process air fan. After the heat accumulator C has been purged, it can be used in the subsequent cycle for cooling the purified exhaust gas of the combustion chamber.

CATALYST UNIT (SCR)

In principle, the catalytic converter unit using the SCR (Selective Catalytic Reduction) process is comparable to the catalytic converter technology used in cars or even trucks to reduce nitrogen oxides. The raw gas from the RNV unit is heated to the required reaction temperature of approx. $300\text{ }^{\circ}\text{C}$ by a heat exchanger. To reduce the nitrogen oxides (NO_x) contained in the exhaust gas, ammonia is added as a reducing agent. With the aid of a catalyst, the nitrogen oxides are thus effectively converted to nitrogen (N_2) and water (H_2O).

The investment of around € 6 million in the new RTO plant has once again significantly reduced emissions at the Trostberg site.



Trostberg Site

Alzchem Trostberg GmbH is the operator of the Trostberg Chemical Park and also provides the necessary infrastructure for the companies located at the site: BASF, MBCC Group, Firmenich as well as ARAMARK (company restaurant) and VIACTIV (health insurance).

The key figures on environmental aspects presented in this environmental statement refer exclusively to Alzchem Trostberg GmbH.

The chemical park is located in the south of the town of Trostberg in the immediate vicinity of the Alz River and the Alz Canal. To the north, the chemical park borders a residential area and a school center; to the south and east, there are mainly wooded areas. A drinking water protection area is designated to the east of the site.

In addition, the chemical park is located on the Traunstein - Garching an der Alz railroad line and thus has a connection to the public rail network.

Alzchem Trostberg GmbH employs around 1,100 people at its Trostberg site.

ENVIRONMENTALLY RELEVANT FACILITIES AND ACTIVITIES

In 15 production facilities, Alzchem manufactures chemical products for a wide range of applications - including agriculture, the pharmaceutical industry, food supplements, metallurgy and automotive.

In addition to the production facilities, Alzchem maintains important infrastructure facilities in Trostberg, such as the air separation plant for the extraction of nitrogen and oxygen, the utility plant with boiler plant, drinking and service water wells, the plant railroad, the central waste water treatment plant (ZABA), the cooling water retention basin and facilities for waste gas purification.

Various raw material and product warehouses as well as a logistics center enable efficient and environmentally friendly raw material supply and product distribution. Various workshops ensure the maintenance of the facilities and the plant site.

The chemical park is also home to the administrative departments and the Innovation Management department with analytical and research laboratories and several pilot plants. Alzchem also operates the Benetsham landfill site, where waste was deposited in the past. This is located about 4 km southeast of the chemical park. No waste has been deposited there in the last three years.

In addition, Alzchem Netz GmbH is a public electricity network operator. This includes three 110 kV high-voltage lines: from Töging to Hart, from Neuötting to Hart and from Hart to Trostberg.

KEY FIGURES ON ENVIRONMENTAL PERFORMANCE

Key Figures Trostberg site		2019	2020	2021
Production output	1000 t	272.0	258.1	309.3
Environmental indicators				
Raw material input	t/t Produkt	0.82	0.88	0.85
Fuel consumption	MWh/t Produkt	0.38	0.45	0.38
Electric power consumption	MWh/t Produkt	0.33	0.35	0.31
thereof „renewable energies“	MWh/t Produkt	0.01	0.01	- *)
Water consumption	m ³ /t Produkt	53.3	61.7	57.3
Waste generation (production-specific) ***)	t/t Produkt	0.070	0.083	0.070
thereof „hazardous“	t/t Produkt	0.068	0.081	0.055
Ammonia emissions	kg/t Produkt	0.032	0.037	0.031
Dust emissions	kg/t Produkt	0.002	0.003	0.002

CO ₂ emissions(new) ****)	t/t Produkt	0.12	0.13	0.10
NO _x emissions	kg/t Produkt	0.10	0.11	0.10
Total area site	m ² /t Produkt	2.20	2.32	1.94
sealed surfaces	m ² /t Produkt	0.81	0.86	0.71
natural areas	m ² /t Produkt	- **)	0.04	0.39

*) Value for 2021 not yet available, share of renewable electricity will only be communicated to us in the course of the year

**) Natural areas were considered and reported for the first time in 2020.

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

****) in relation to the CO₂ emissions of the site (Scope 1).

PRODUCTION VOLUMES

Products (in tons)	2019	2020	2021
Main products	175,279	174,860	207,198
By-products	96,726	83,204	102,075
Total	272,005	258,064	309,273

The total amount of manufactured products has increased by 20 % in 2021.

The volume of main products manufactured increased by 18 % compared to the previous year. This increase resulted from higher sales volumes of a large number of products such as CaD®, Perlka® and Creapure®.

The volume of by-products increased by 23 % in the same period. The disproportionate increase in by-products is due, among other things, to an increase in internal recycling in the sense of a circular economy.

RAW MATERIALS, CONSUMABLES AND SUPPLIES

Material (in tons)	2019	2020	2021
Raw material	221,714	226,373	262,994

The increase in raw materials used is 16 % compared to the previous year. Compared with the 20 % increase in production output, a significant increase in resource efficiency is apparent.

Around 80 % of the raw materials are supplied by the neighboring Alzchem sites in Hart and Schalchen. In terms of volume, nitrogen from the air separation plant in Trostberg and carbide and carbide furnace gas from the Hart site are the most important raw materials.

At 0,85 t raw material / t product, specific raw material consumption in the reporting period was 3 % lower than in 2020,

ENERGY

The site's total energy demand in 2021 was 233 gigawatt-hours (GWh).

Of this, 142 GWh (61 %) of purchased energy was used in the form of electricity, natural gas and heating oil.

90 GWh (39%) came from the energy recovery of the carbide furnace gas produced as a by-product at the Hart site and the internal heat recovery at the Trostberg site. Compared to 2020, the share of purchased energy in the total energy requirement was reduced by 3 %.

Energy (in Megawatt-hours (MWh))	2019	2020	2021
Total energy	211,245	223,804	232,798
Electrical energy	89,754	90,645	96,007
thereof renewable	1,436	1,541	*)
Carbide furnace gas	67,277	63,139	71,710
Natural gas	33,276	46,815	40,165
Heating oil	3,102	5,054	4,940
Fuels (diesel/gas)	764	764	791
Heat recovery	17,072	17,387	19,185

*) Value for 2021 not yet available, share of renewable electricity will only be communicated to us in the course of the year

Although the electricity demand of 96 GWh has increased by 6 % compared to the previous year, the specific electricity demand in relation to the produced quantities has decreased significantly by approx. 11 % compared to 2020.

The volume of carbide furnace gas available for power generation was almost 14 % higher than the previous year due to the increased production volume of carbide and accounted for a total of 52 % of the energy carriers used in addition to electricity. As a result, the use of natural gas as a further energy source was significantly reduced by 14 %.

Heating oil and fuels (diesel and gas) account for only a minor share of 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 to heat buildings, for preheating in the manufacturing processes and for heating water. The share of the total energy input is 8 %.

Thanks to the more effective use of electricity, the increased quantity of carbide furnace gas and the increased use of the internal heat network, the total specific energy consumption per ton of product was reduced from 0.87 to 0.75 MWh compared with the previous year. Overall, this results in a saving of more than 35,000 MWh, which is roughly equivalent to the annual electricity consumption of 10,000 households.

The share of electricity from renewable sources increased only slightly in 2020 compared to 2019 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 equalization scheme under the Renewable Energy Sources Act (EEG) and is particularly dependent on cheap electricity for economic reasons. Due to this equalization scheme, Alzchem has to pay a lower EEG levy, but only receives a small share of electricity from renewable sources in return.

In order to increase the share of renewable electricity in the future and thus reduce the CO₂ emissions from external energy purchases.

Alzchem is currently conducting a study on the possibility of Power Purchase Agreements (PPA). This type of long-term "power purchase agreement" could make larger quantities of renewable electricity available to Alzchem for all sites in the future.

WATER/WASTE WATER

Alzchem produces all the industrial and drinking water it needs in Trostberg from its own groundwater wells.

Drinking water is supplied from two wells east of the plant site in Trostberg. A corresponding drinking water protection area has been designated.

To secure the supply, there is also a connection to the Trostberg municipal drinking water network, so that water can be supplied in both directions at short notice if required.

The service water supply is used to supply the production plants with cooling water and for various other purposes, including steam generation and as process and washing water in the production plants.

The pumped service water is fed from a total of eight wells into a ring main from which the supply takes place. Technical measures ensure that only the amount of water actually required is pumped and that no well water is discharged unused.

Water (in m ³)	2019	2020	2021
Service Water	14,386,09	15,836,517	17,629,364
Drinking water	119,660	82,255	84,728

The demand for process water increased in 2021 due to the increased production volume and the associated higher cooling requirements. In relation to the production volume, however, water consumption was significantly reduced from 61.4 m³/ton of product in the previous year to 57.3 m³/ton of product.

The maximum industrial water withdrawal volume set by the authorities was utilized by 59 % in the reporting year 2021.

Waste Water (in m ³)	2019	2020	2021
Not requiring treatment (cooling water)	14.386.109	15.836.517	17.629.364
Precipitation water	201.248	203.714	210.864
Operational waste water	44.709	47.358	62.670
Sanitary waste water (via municipal waste water treatment plant)	118.107	66.657	84.204

The majority of the water required by Alzchem in 2021 - around 17.7 million m³ - is so-called process water from the company's own network of industrial wells. It is used to 99% as pure flow-through cooling water, is not contaminated and is only discharged into the Alz at a higher temperature. In relation to the increased production volumes, more than 4 m³ of cooling water could be saved per ton of product manufactured in 2021, corresponding to a total volume of more than 1.2 million m³.

In 2021, around 211,000 m³ of precipitation water from roofs and other sealed surfaces was discharged into the Alz. The cooling water and rainwater are discharged via a separate sewer system, which is monitored analytically for contamination by permanently installed measuring equipment. Before being discharged into the Alz, the water collected in the sewer system is passed through a retention basin in which the water is also constantly monitored by permanently installed measurements.

In case of contamination, the wastewater is automatically retained in the retention basin.

Operational wastewater is generated 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 via the plant's own central wastewater treatment plant (ZABA). This proportion increased sharply by 32 % in 2021. After treatment in the ZABA, a total of 62,670 m³ of treated wastewater was discharged into the Alz Canal in 2021. Wastewater that cannot be treated via the ZABA is disposed of as liquid waste.

The permits for both the discharge from the ZABA and the discharge of cooling water at the Trostberg site expire at the end of 2022 and must be reapplied for. For this purpose, work began at the end of 2019 on the preparation of a water ecology report by external experts. This will determine the effects of the discharges into the Alz on the basis of detailed studies. This report will then form an essential basis for the authorities to approve the permissibility and scope of future discharges.

Sanitary wastewater is fed to the Trostberg municipal wastewater treatment plant for treatment. In terms of its composition, it largely corresponds to the usual wastewater from private households.

CENTRAL WASTEWATER TREATMENT PLANT (ZABA)

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

The wastewater pretreated in this way is then fed to the second biological treatment stage. Here, the ammonium 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 combined nitrogen (TN_b) 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 clearly undercut.

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 analyzed 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 2021, no limit value exceedance was detected by the technical water supervision as part of the official monitoring.

Schadstofffrachten im Abwasser (via ZABA, in kg)	2019	2020	2021	Utilization limits 2021 *)
CSB	3,225	2,158	2,990	5.6 %
BSB	70	70	84	n. r. **)
AOX	0.5	0.5	0.6	0.4 %
Phosphorus	22	19	17	15 %
Nitrogen inorganic	373	209	406	10 %

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

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

EMISSIONS

Emissions (to air, in t)	2019	2020	2021
Dust	0.48	0.72	0.75
Nitrogen oxides (NO _x)	27.9	28.6	30.3
Sulfur oxides (SO _x)	6.90	5.84	8.19
Ammonia (NH ₃)	8.70	9.46	9.50
Carbon monoxide (CO)	7.39	8.04	10.7
Organic Carbon (org. C)	1.56	1.60	1.56
Carbon dioxide (CO ₂) *)	32,210	32,591	32,160

*) CO₂ emissions of the site (Scope 1)

Exhaust gases contaminated with pollutants are largely fed to the waste incineration plant, a thermal afterburner and the newly commissioned regenerative thermal oxidation (RTO) plant, where they are cleaned. In addition, local waste gas purification systems such as waste gas scrubbers, cryo-condensers, filters or activated carbon absorbers are used.

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

In absolute terms, emissions of dust, ammonia, organic substances, nitrogen oxides and CO₂ are at a comparable level to the previous year. In relation to the quantities produced, however, emissions of these substances were significantly reduced compared with 2020: Dust -33 %, ammonia -27 %, organic substances -19 %; CO₂ -14 %, nitrogen oxides -9 %.

Emissions of carbon monoxide and sulfur oxides were higher than in the previous year in absolute terms and in relation to the quantities produced: Carbon monoxide +10 %, sulfur oxides +17 %. This is due to the fact that the commissioning of the regenerative thermal oxidation (RTO) plant for exhaust air purification has added a new captured exhaust gas stream.

Steam is required on a large scale as an energy source at the site. Carbide furnace gas (CO gas) from Hart and natural gas are the primary energy sources used to generate steam in the boiler house. Combustion of these gases 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 include drying operations, thermal off-gas/waste incineration facilities, and, to a lesser extent, chemical and biological reactions.

In 2021, a series of measurements were again arranged and carried out by Alzchem in addition to the emission measurements required by the authorities. During these emission measurements, a single, short-term exceedance of the officially approved limit value for organic substances was detected. The limit value of 0.10 kg/h was exceeded by 0.125 kg/h during a short-term production campaign. In this case, the responsible authority was informed immediately and effective organizational and technical countermeasures were initiated. Due to the low level, the exceedances did not pose a risk to the environment at any time.

The emission data from our waste incineration plant (AGV) are published annually on the Alzchem Trostberg GmbH homepage (<https://www.alzchem.com/de/unternehmen/qualitaet-umwelt/>) and show the reliable operation of the waste gas purification facilities.

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 NEIGHBORHOOD

No complaints were reported to Alzchem in the reporting year 2021.

WASTE

Waste (in t)	2019	2020	2021
Production specific waste	18,952	21,542	21,550
Waste not specific to production	4,672	5,037	4,056
Total waste (production-specific + non-production-specific)	23,624	26,578	25,606
Share of hazardous waste	18,724	20,925	17,278
of which aqueous washing liquids and mother liquors *)	10,178	12,807	10,908
of which halogenated reaction and distillation residues *)	6,924	6,101	4,528
of which other organic solvents, washing liquids and mother liquors*)	691	920	727
Share of external recycling	5,023	8,103	5,656

*) Proportion of significant "production-specific waste" to "hazardous waste".

Production-specific waste is generated directly during the manufacture of our products and will continue to account for the largest share of waste in 2021 at 21,550 tons. A large number of different products are manufactured in Trostberg. These can differ significantly in their specific waste generation. Relating the amount of waste to the total production output is therefore not always meaningful on its own. Nevertheless, compared with the previous year, it can be stated that the production-specific waste volumes per ton of product have fallen significantly by 16 %. In addition, the proportion of hazardous waste in relation to the volume produced was reduced by 31 %.

The amount of non-production waste, e.g. from construction/demolition activities or municipal waste similar to household waste, decreased to 4,056 t compared to the previous year due to lower construction and demolition activities.

The proportion of waste sent for recycling has fallen significantly. It should be noted here that waste streams recycled internally and returned to the material cycle in this way do not appear in this list. 1,496 t of waste were recycled internally and thus did not have to be disposed of externally.

TRANSPORT

Transport volume (in t)	2019	2020	2021
Total volume	559,980	497,805	577,636
Street	222,370	208,960	231,455
Rail	310,130	262,794	314,255
Combined (Air/sea)	27,480	26,051	31,926

The transport volume of the Trostberg site – a total of 577,636 t in 2021 – has increased by approx. 16 % compared to the previous year and thus reflects the increased production output. The traffic volume due to production-related delivery traffic breaks down as follows:

In 2021, 54 % (previous year 53 %) of freight was transported by rail and 40 % (previous year 42 %) by truck via road. The share of "combined transport" was 5.5 % (previous year 5.2%). This mainly involves sea freight containers 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 proportion of this is air freight.

With the planned expanded reporting of CO₂ emissions according to Scope 2 and 3, we will also report greenhouse gas emissions according to the GHG Protocol from our transports here in the future.

PASSENGER TRANSPORT

Passenger transport (in km)	2019	2020	2021
Trostberg, Schalchen, Hart Waldkraiburg			
Total distance	3,515,906	962,246	1,391,634
Airplane	2,463,157	164,478	792,085
Car	875,000	750,000	560,000
Railroad	109,118	36,108	24,494
Cab	68,631	11,660	15,055

Alzchem's total business travel – in 2021 a total of approximately 1.4 million km – increased again by 44 % compared to the previous year, but is still far below the values before the COVID-19 pandemic. It is clear here that in the second year of the COVID-19 pandemic, more trade shows were held again and more personal customer contact was possible.

Overall, it has been shown that a great many face-to-face contacts can be replaced by online meetings, thus permanently reducing the environmental impact of passenger traffic.

The steadily increasing number of electricity-powered company cars at Alzchem also contributes to a reduction in CO₂ emissions. These figures refer to all four sites covered in this environmental statement, as the data collection is not divided into sites.

LAND CONSUMPTION

Land consumption (in m ²)	2019	2020	2021
undeveloped areas (gravel area, lawn, green area, agricultural area, forest area,...))	378,304	378,031	377,832
thereof "natural areas"	n. b. *)	10,370	122,078
sealed surface	107,700	107,775	107,625
built-up areas	112,929	113,127	113,356
Total area site	598,933	598,933	598,813

*) n. b. = the near-natural areas were defined and assigned measures for the first time in 2020.

Land consumption at the Trostberg site was very low in 2021. The proportion of undeveloped land remains at a high 63%.

It is particularly noteworthy that the Trostberg site has largely self-sufficient rough pastures, some of which have a very high plant and animal diversity. These areas are deliberately mowed only twice a year, so that a pronounced biodiversity could develop here.

At this point, the "Götzinger-Leite" at the Trostberg site also deserves special mention. The "Götzinger-Leite" is an approx. 11.2 ha large, natural forest area owned by Alzchem, which is directly adjacent to the Trostberg site. Since this piece of forest is only very lightly managed, deadwood is available to highly specialized species of animals, fungi, lichens and mosses and accounts for the special value of this economically unused forest.

ENVIRONMENTAL PROTECTION COSTS

In 2021, environmentally relevant investments amounting to approximately € 2,1 million were made at the Trostberg site. Total expenditures for environmental protection operating costs amounted to approximately € 15 million in 2021.



Schalchen Site

The Schalchen site of Alzchem Trostberg GmbH with around 130 employees is located in the municipality of Tacherting in the district of Traunstein. The site has a size of around 7.8 hectares, 48 % of which is undeveloped area and green space. The plant site is crossed by the Alz Canal.

To the south and west there are further industrial settlements, to the north there is a residential area immediately adjacent and to the east there is agricultural land.

Three production facilities are operated on the plant site. The plant infrastructure includes a utility plant to provide the required process energies, laboratories, warehouses and workshops.

No other companies are currently represented at the Schalchen site.

ENVIRONMENTALLY RELEVANT FACILITIES AND ACTIVITIES

As a manufacturer of high-quality intermediates used primarily in the life science sector, the Schalchen site is an important partner to the pharmaceutical and agricultural industries.

Standard products at the Schalchen site include dicyandiamide (DCD) and mixtures made from it, as well as guanidine nitrate, guanidine hydrochloride and other guanidine salts.

The production of DCD results in special lime, which is used in the cement industry and in agriculture.

Key figures Schalchen site		2019	2020	2021
Production output	1000 t	120.7	122.3	146.7
Environmental indicators				
Raw material input	t/t Produkt	0.92	0.89	0.88
Fuel consumption	MWh/t Produkt	0.65	0.63	0.55
Power consumption	MWh/t Produkt	0.19	0.18	0.16
thereof „renewable energies“	MWh/t Produkt	0.01	0.01	-*)
Water consumption	m ³ /t Produkt	64.3	60.3	54.8
Waste generation ***)	t/t Produkt	0.042	0.034	0.025
thereof „hazardous“	t/t Produkt	0.042	0.034	0.025
Dust emissions	kg/t Produkt	0.005	0.005	0.003
CO ₂ emissions ****)	t/t Produkt	0.11	0.12	0.08
NO _x emissions	kg/t Produkt	0.06	0.06	0.06
Total area location	m ² /t Produkt	0.62	0.62	0.51
Sealed surfaces	m ² /t Produkt	0.33	0.33	0.27
Natural areas	m ² /t Produkt	**)	0.02	0.02

*) Value for 2021 not yet available, share of renewable electricity will only be communicated to us in the course of the year

**) natural areas were considered and reported for the first time in 2020.

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

****) in relation to the site's CO₂ emissions (Scope 1).

PRODUCTS

Products (in t)	2019	2020	2021
Total products	120,674	122,294	146,745

The total amount of manufactured products has increased by 20 % in 2021.

This higher output can be attributed to all products manufactured at the site and also to the by-product special lime.

RAW MATERIALS, COSUMABLE AND SUPPLIES

Material (in t)	2019	2020	2021
Raw material	111,005	108,392	129,608

The quantities of raw materials used increased by 20 % compared to the previous year due to the higher production volume. Compared with the 20 % higher production output, a slight increase in resource efficiency can be seen.

A good half of the raw material volume is calcium cyanamide, which is sourced from the neighboring Alzchem site in Trostberg. Carbide furnace gas gas, which is supplied via a long-distance gas pipeline from the Hart site, accounts for around a quarter. The remainder is accounted for by purchased raw materials.

The trend towards a slight improvement in specific raw material consumption continued in the reporting period with 0.88 t raw material / t product.

ENERGY

ENERGY CONSUMPTION

Energy (in MWh)	2019	2020	2021
Total energy	100,925	98,855	104,523
Elektrische Energie	23,071	21,705	23,617
thereof "renewable energy"	807	846	*)
Carbide furnace gas	71,464	69,674	72,544
Heating oil	6,241	7,376	8,204
Fuel (diesel/gas)	149	100	158

*) Value for 2021 not yet available, share of renewable electricity will only be communicated to us in the course of the year

Although the total amount of electricity purchased increased by 9 % year-on-year to 23.6 GWh, the specific electricity demand in relation to the quantities produced decreased by 9 % compared to 2020.

At 0.16 MWh per ton of product, Schalchen has the lowest electricity intensity of all Alzchem sites.

The amount of carbide furnace gas used for power generation was 4% higher than the previous year. This means that 90 % of the energy used in addition to electricity was generated from carbide furnace gas as a by-product. Heating oil is used as a further energy source mainly when carbide furnace gas is not sufficiently available.

Fuels (diesel and gasoline) account for only a minor share of energy supply and remain at a low level.

The share of electricity from renewable sources increased slightly in 2020 compared to 2019 and was a low 3.9%.

This is mainly due to the fact that Alzchem, as an electricity-intensive company, makes use of a special equalization scheme under the Renewable Energies Act (EEG) and is particularly dependent on cheap electricity for economic reasons. Due to this equalization scheme, Alzchem has to pay a lower EEG levy, but only receives a small share of the electricity as renewable energies.

In order to increase the share of renewable electricity in the future and thus reduce CO₂ emissions from external energy purchases, Alzchem is currently conducting a study on the possibility of Power Purchase Agreements (PPA). This type of long-term "power purchase agreement" could make larger quantities of renewable electricity available to Alzchem for all sites in the future.

WATER/WASTE WATER

WATER

Water (in m ³)	2019	2020	2021
Service water	7,761,046	7,375,104	8,035,268
Drinking water	3,535	1,655	2,124

Alzchem operates six of its own wells at the Schalchen site to supply service water. Drinking water is obtained from the public water supplier.

The demand for process water has increased in 2021 due to the increased production volume and the associated higher cooling requirements. In relation to the production volume, however, water consumption was significantly reduced from 60.3 m³/ton of product in the previous year to 54.8 m³/ton of product. This saved around 575,000 m³ of water.

The maximum industrial water withdrawal volume set by the authorities was utilized 61 % in the reporting year 2021.

WASTE WATER

Waste Water (in m ³)	2019	2020	2021
Production and cooling water (direct discharge into Alz canal)	7,703,756	7,318,097	7,962,458
Precipitation water (direct discharge into Alz canal)	39,858	39,897	41,301
Sanitary waste water (Indirect discharge into the municipal wastewater treatment plant)	3,765	1,731	2,188

The majority of the water pumped from the company's own wells (approx. 7.96 million m³ in 2021) is used as flow-through cooling water, and is therefore not contaminated with materials and is only discharged into the Alz Canal at an increased temperature together with the precipitation water.

Operational wastewater is largely recycled internally. A small proportion of the process wastewater is treated internally and discharged into the Alz Canal together with the cooling water and precipitation water:

Pollutant loads in wastewater (in kg)	2019	2020	2021	Utilization limits 2021 *)
Phosphorus	83	76	119	18 %
Nitrogen inorganic	24,144	17,416	18,880	26 %

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

The discharges are regularly sampled and analyzed by Alzchem and by the authorities. The limits defined in the notice for the discharge into the Alz Canal were complied with in 2021.

The phosphorus load increased compared to previous years due to slightly higher measured values in conjunction with the higher wastewater volumes. However, the maximum analyzed phosphorus concentration remained at a very low level of 16% of the limit value.

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 is then an essential basis on which the authorities approve the permissibility and extent of future discharges.

The sanitary wastewater of the site is fed to the municipal wastewater treatment plant of the municipality of Tacherting and shows an increase analogous to the drinking water input.

EMISSIONS

EMISSIONS TO THE AIR

Emissions (to air, in t)	2019	2020	2021
Dust	0.55	0.56	0.49
Nitrogen oxides (NO _x)	7.74	7.28	8.86
Sulfur oxides (SO ₂)	4.05	4.02	1.12
Ammonia (NH ₃)	1.12	0.98	0.98
Carbon monoxide (CO)	3.49	3.53	3.18
Carbon dioxide (CO ₂) *)	13,390	14,069	11,348

*) CO₂ emissions of the site (Scope 1)

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

The main remaining emissions to air are due to the exhaust gases from power generation.

Of particular environmental relevance are dust, nitrogen oxides (NO_x), sulfur oxides (SO_x), ammonia (NH_3), carbon monoxide (CO) and carbon dioxide (CO_2).

Despite the increase in production volumes, emissions of dust were reduced by 12 % in absolute terms and emissions of carbon monoxide (CO) by 9 %.

Nitrogen oxides (NO_x) have increased in absolute terms, but are at a constant level specifically per ton of product.

There was a very large decrease in sulfur oxides (SO_x) compared to previous years. This is due to the recurring, three-year emission measurement in 2021. The results of these measurements were again at a lower level compared with the measurement in 2018, resulting in a reduction in the SO_x load to be reported.

Ammonia emissions have remained the same in absolute terms, but specifically, in relation to production volumes, there has been a significant reduction of 17 %.

Exhaust gases (main component CO_2) from energy generation are largely not emitted, but used as raw material in the DCD plant. As a result, approx. 30,000 t CO_2 from energy generation can be recycled directly in production and are not emitted. The remaining CO_2 released into the atmosphere was reduced by 19 % in absolute terms through increased internal use as a raw material.

NOISE

To the west of the plant is a commercial area. There, the noise immission guide values of 65 dB(A) during the day and 50 dB(A) at night must be complied with. The residential development 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 must be complied with.

The values were complied with according to the last measurement.

COMPLAINTS FROM THE NEIGHBORHOOD

No complaints were reported to Alzchem in the reporting year 2021.

WASTE

Waste (in t)	2019	2020	2021
Production specific waste	5,012	4,131	3,645
of which aqueous washing liquids and mother liquors*)	4,283	3,523	2,964
of which other filter cakes, used absorbent materials*)	539	384	519
of which halogenated filter cakes, used absorbent materials*)	115	170	118

Waste not specific to production	2,632	2,441	700
Total waste (production-specific / non-production-specific)	7,643	6,572	4,345
Share of hazardous waste in total waste	5,017	5,044	3,665
Proportion of total waste recycled externally	5,603	4,974	2,980

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

Production-specific waste mainly arises from organic-chemical processes and, at 3,645 t in 2021, again represents the largest share of waste and has decreased significantly by 12 % compared to the previous year due to increased internal recycling.

The amount of non-production waste, which decreased sharply in 2021 due to significantly lower construction and demolition activities, is 700 tons.

The proportion of hazardous waste has fallen sharply by 27 % as a result of higher recycling.

The rate of external recycling decreased to 69% (previous year: 76 %). This is due to an increase in internal recycling totaling 1,811 t, so that these quantities no longer had to be disposed of externally.

TRANSPORT

Transport volume (in t)	2019	2020	2021
Total volume	190,978	199,872	234,931
Street	38,076	31,039	32,932
Rail	146,747	161,556	192,099
Combined	6,155	7,277	9,900

The transport volume at the Schalchen site in 2021 - a total of 234,931 t - has increased compared to the previous year, in line with production output, due to positive sales developments.

The traffic volume breaks down as follows:

At 82 % (previous year: 81 %), the share of freight traffic handled by rail is gratifyingly 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. In combined air/road transport, only 38 tons were transported in 2021.

With the planned expanded reporting on CO₂ emissions according to Scope 2 and 3, we will in the future also report the greenhouse gas emissions according to the GHG Protocol from our transports.

LAND CONSUMPTION

Land consumption (in m ²)	2019	2020	2021
undeveloped areas (gravel area, lawn, green area, agricultural area, forest area,...)	35.342	35.342	35.300
thereof "natural areas"	0*)	2.930	2.930
sealed surfaces	19.390	19.390	19.432
built-up areas	20.500	20.500	20.709
Total area location	75.232	75.232	75.232

*) the natural areas were designated for the first time in 2020.

The near-natural areas are essentially a meadow with fruit trees, which offers a diverse habitat for various animals through targeted maintenance, as well as old trees.

ENVIRONMENTAL PROTECTION COSTS

In 2021, environmentally relevant investments amounting to approximately € 334 k were made at the Schalchen site. Total expenditures for environmental protection operating costs amounted to approximately €1,34 million in 2021.



Hart Site

The Hart site is located in the south of the municipality of Unterneukirchen in the district of Altötting.

The plant site has an area of 49 ha, of which 23 ha are forest areas, the landfill and the well site.

To the west, the plant borders directly on residential areas in the Hart district of the municipality of Garching an der Alz. There are also woods and agricultural areas in the vicinity of the plant site.

The Alz and Alzbach rivers run south of the plant. Alzchem Trostberg GmbH operates its own wells in the Alzau south of the plant site to supply service and drinking water.

In addition to Alzchem Trostberg GmbH, the Hart site is also home to ASK Chemicals Metallurgy GmbH. As the site operator, Alzchem provides services for both production plants and ensures the supply of energy and media (cooling water, compressed air, etc.). The key figures on environmental aspects presented in this environmental statement refer exclusively to Alzchem Trostberg GmbH.

Alzchem employs around 240 people at the Hart site.

ENVIRONMENTALLY RELEVANT FACILITIES AND ACTIVITIES

Alzchem Trostberg GmbH produces calcium carbide at its Hart site. In two closed low-shaft furnaces, coke and quicklime react to form calcium carbide and carbide furnace gas, which is a by-product. This is a very electricity-intensive process.

The annual production of carbide is transported mainly by rail to the Trostberg site, where it is processed into a variety of specialty products for Alzchem's Verbund production and into hot metal desulfurization agents.

The filter dusts produced in the carbide furnace process are processed and marketed as a by-product. This has significantly reduced the amount of waste to be landfilled in recent years.

The production site also includes a landfill, utility operations and rail operations.

Key figures Hart site		2019	2020	2021
Production output	1000 t	128	124	141
Environmental indicators				
Raw material input	t/t Produkt	1.58	1.48	1.44
Fuel consumption	MWh/t Produkt	0.012	0.014	0.011
Electric power consumption	MWh/t Produkt	3.40	3.35	3.34
thereof „renewable energies“	MWh/t Produkt	0.04	0.04	- *)
Water consumption	m³/t Produkt	79.3	77.0	70.8
Waste generation (production-specific) ***)	kg/t Produkt	1.20	1.91	1.17
thereof „hazardous“	kg/t Produkt	1.20	1.91	1.17
Dust emissions	kg/t Produkt	0.056	0.027	0.024
CO ₂ emissions ****)	t/t Produkt	0.125	0.112	0.103
Heavy metals	kg/t Produkt	0.0015	0.0013	0.0011
Total area location	m²/t Produkt	0.0020	0.0021	0.0018
sealed surface	m²/t Produkt	0.0011	0.0012	0.0010
natural areas	m²/t Produkt	- **)	0.0004	0.0004

*) Value for 2021 not yet available, share of renewable electricity will only be communicated to us in the course of the year

**) natural areas were considered and reported for the first time in 2020.

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

****) in relation to the site's CO₂ emissions (Scope 1).

PRODUCTS

Products (in t)	2019	2020	2021
Main Products (carbide)	128,164	123,810	141,044
By-product (carbide furnace gas)	60,502	57,525	63,370
Total	188,666	181,335	204,414

The main product at the Hart site is calcium carbide, which forms the basis for various products within the Alzchem production network. The volume of calcium carbide produced increased by 14 % in 2021.

A by-product at Hart is carbide furnace gas, which contains significant amounts of hydrogen 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. However, the majority is transported via a long-distance gas pipeline to the Trostberg and Schalchen sites, where it is used as a heating and synthesis gas.

RAW MATERIALS, CONSUMABLES AND SUPPLIES

RAW MATERIAL

Alzchem used around 203,000 tons of raw materials in production at the Hart site in 2021.

Material (in t)	2019	2020	2021
Raw materials	202,119	183,205	203,343

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) increased by 2 % in 2021 compared to the previous year.

ENERGY

Very large amounts of electrical energy are required to operate the furnaces in which the carbide is produced.

Energy (in MWh)	2019	2020	2021
Electrical energy	435,460	414,909	471,358
thereof "renewable energies"	4,790	4,564	- *)
Heating oil	919	1,129	776
Fuel (diesel)	670	639	720
carbide furnace gas (quantity used in the steam boiler))	19,879	20,408	19,817

*)Value for 2021 not yet available, share of renewable electricity will only be communicated to us in the course of the year

Electricity demand for carbide production has increased by about 56 GWh in 2021 due to higher production volumes, but is at a constant level per ton of carbide produced.

The carbide furnace gas produced as a by-product at the site is used as an energy source for steam generation. The quantity of fossil fuels replaced by this is equivalent to 2 million liters of heating oil.

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

The share of electricity from renewable sources was 1% in 2020, as in the previous year.

The reason for this is that Alzchem, as an electricity-intensive company, makes use of a special equalization scheme under the Renewable Energies Act (EEG) and is particularly dependent on cheap electricity for economic reasons. Due to this equalization scheme, Alzchem has to pay a lower EEG levy, but in return only receives a small share of electricity from renewable sources.

In order to increase the share of renewable electricity in the future and thus reduce CO₂ emissions from external energy purchases, Alzchem is currently conducting a study on the possibility of Power Purchase Agreements (PPA). This type of long-term "power purchase agreement" could make larger quantities of renewable electricity available to Alzchem for all sites in the future.

WATER/WASTE WATER

WATER SUPPLY

Alzchem Trostberg GmbH operates ten of its own service 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: In carbide production, which takes place at very high temperatures, water is needed to a large extent to cool the carbide furnaces.

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

Water (in m ³)	2019	2020	2021
Total volume (industrial and drinking water))	10,158,531	9,529,494	9,981,338
Service water	7,529,618	6,916,407	7,387,522
Drinking water	2,628,913	2,613,087	2,593,816
Precipitation water	111,077	110,788	120,755

The maximum industrial water withdrawal volume set by the authorities was utilized to 50 % in the reporting year 2021.

Overall, water consumption in 2021 was slightly above the level of 2020, but specific water consumption per ton of product manufactured decreased by 8 %.

The plant's drinking water supply comes from its own well 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.

WASTE WATER

Waste Water (in m³)	2019	2020	2021
Total amount	10,240,228	9,615,429	10,071,068
Cooling Water (direct discharge into the Alzbach river incl. precipitation water and production wastewater)	10,227,963	9,602,802	10,060,207
Sanitary waste water (indirect discharge via municipal wastewater treatment plant Garching/Alz)	5,052	4,887	5,031
Landfill leachate (indirect discharge via municipal wastewater treatment plant Garching/Alz)	7,213	7,740	5,830

The majority of the water pumped from the company's own wells (approx. 10 million m³ in 2021) is used as flow-through cooling water, is contaminated with substances below the analytical detection limits and is only discharged into the Alzbach together with the precipitation water at an increased temperature.

Production wastewater is generated in carbide operations by a so-called sealing water circuit, which is required for safety reasons and safely separates the furnace gas from the atmosphere. However, this causes dust from the furnace gas to enter the sealing water. Although this water is circulated to prevent it from silting up, part of it must be 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 sanitary wastewater from the site (5,031 m³) and the landfill leachate (5,830 m³) were discharged to the Garching municipal wastewater treatment plant via the sewer system or transported by truck. The wastewater treated there is discharged into the receiving waters of the Alz River. Due to the low loads of this wastewater delivered to the treatment plant, it is not included in the following table.

TOTAL POLLUTANT LOADS FROM DIRECT DISCHARGE OF COOLING WATER INTO ALZBACH:

Pollutant loads in waste water (in kg)	2019	2020	2021	Ausschöpfung Grenzwerte 2021 *)
filterable substances	41,505	48,705	21,126	1.8 %
Nitrogen inorganic	88,041	75,376	65,391	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

As part of an ongoing program of the Bavarian State Office for the Environment (LfU), a so-called biomonitoring system has been installed for a large number of organic pollutants that represent a burden on the environment. For example, mussels are placed in water, removed after a certain time and examined for the accumulation of certain pollutants. An increased concentration of polycyclic aromatic hydrocarbons (PAHs) was found along the Alz. This group of substances comprises a large number of individual compounds that are difficult to degrade.

The substances are part of traffic exhaust gases, are produced in industrial processes and during wood combustion (domestic fire). In the process, the PAHs accumulate on soot and dust particles and thus enter the environment. Analyses carried out by Alzchem also identified a partial stream of wastewater from carbide production as one of the entry pathways.

The wastewater from the carbide furnaces operated at the Hart site was previously treated in a wastewater treatment plant before being discharged into the Alzbach in such a way that the officially approved limit values for filterable substances (AfS) were complied with.

To further minimize the input of PAHs through this pathway, a project was started in cooperation with the authorities to increase the separation efficiency of wastewater treatment. Through systematic trials, an improved flocculation aid was found to support the separation of filterable substances.

With the improved removal efficiency of the total filterable substances (AfS), the PAHs adhering to the particles in Alzchem's wastewater could also be reduced by a factor of about 100.

In this way, Alzchem was able to make a significant contribution to the overall reduction of the previous input of PAHs into the environment.

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 monitored and analyzed by the authorities.

The limits specified in the permit at the point of discharge into the Alzbach River were met in 2021.

For the discharge into the Alzbach, the permit at the Hart site expires at the end of 2024 and a new application must be submitted. 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 be based on detailed studies to determine the effects of the discharges into the Alzbach and further into the Alz. This report will then form an essential basis for the authorities to approve the permissibility and extent of future discharges.

EMISSIONS

EMISSIONS

Dust emissions are generated during the production of calcium carbide. These are collected by extraction systems and fed into effective filter systems in which the dusts are separated.

The consolidation and modernization of these dust removal plants in the carbide production area and an overall more stable operation of the carbide production, including reduced downtimes of the gas cleaning system, have significantly reduced dust emissions since 2020.

Emissions (to air)	2019	2020	2021
Dust (in t)	7,22	3,38	3,37
Carbon dioxide (CO ₂) *)	15.983	13.862	14.482
Heavy metals (in kg)	0,19	0,16	0,16

*) CO₂ emissions of the site (Scope 1)

In order to be able to permanently monitor compliance with the limit values, continuous dust measurements are installed in some cases. In addition, the emission values are regularly checked by discontinuous measurements.

In the reporting year 2021, the continuously monitored dust limit value was not exceeded at any time, neither in the half-hourly average nor in the daily average.

By operating the carbide furnaces more continuously and coordinating the gas consumers, it was possible to reduce the flare loss and, consequently, the specific CO₂ emission related to the production volume by 8 %.

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 noise emissions from the production facilities and noise from vehicle movements to and from the employee parking lot.

In order to improve the noise situation, a noise abatement concept was drawn up together with the commissioned experts and the responsible authorities. This comprises a series of noise-reducing measures in the production facilities and in the employee parking area. Implementation of the measures was started in 2021, and the entire noise abatement concept is to be implemented by 2025.

COMPLAINTS FROM THE NEIGHBORHOOD

Alzchem received a complaint from an abutting community in 2021.

This relates to a noise and odor nuisance at their station caused by Alzchem trains and their service providers, especially in the evening hours.

The complaint was discussed in person between the mayor of the municipality, the Alzchem board of directors and the Alzchem division manager responsible for transports, and the following remedial measures were defined: Alzchem's own trains deliberately run during the day in order to affect residents as little as possible during nighttime.

The service provider was made aware of the situation by Alzchem in order to achieve an improvement.

WASTE

Waste (in t)	2019	2020	2021
Production specific waste	154	236	166
thereof tars *)	154	235	165
Waste not specific to production	1.909	2.867	1.582
Total waste (production-specific/ non-production-specific)	2.063	3.103	1.748
Share of hazardous waste	213	318	197
Share of recycling	1.015	2.612	1.307

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

Production-specific waste is mainly generated as aqueous scrubbing liquids during kiln gas cleaning. The quantities could be significantly reduced in 2021 (-30 %).

The production-specific waste mainly consists of tar residues.

The filter dusts generated during carbide production are not considered waste, as they are granulated and discharged as a product.

The volume of non-production-specific waste, which is generated, for example, during construction/demolition activities in the form of track ballast or also municipal waste (waste similar to household waste), has decreased considerably compared with the previous year to 1,582 t - but is subject to strong fluctuations depending on the construction/demolition activities.

TRANSPORT

Transport volume(in t)	2019	2020	2021
Total volume	353.531	364.114	398.417
Street	56.429	56.649	59.361
Rail	297.102	307.465	339.056

Freight transport volumes (inbound and outbound) increased significantly by 9 % in 2021 due to higher production volumes. As in previous years, the bulk of this was transported by rail, with only around 15 % of the total transport volume being handled by road. Nothing was transported by air freight.

With the planned expanded reporting of CO₂ emissions according to Scope 2 and 3, we will also report the greenhouse gas emissions according to the GHG Protocol from our transports here in the future.

LAND CONSUMPTION

Land consumption (in m²)	2019	2020	2021
undeveloped areas (gravel area, lawn, green area, agricultural area, forest area,...)	59,713	59,713	59,713
thereof "natural areas"	n. b.	50,150	50,150
sealed surface	62,643	62,643	62,643
built-up areas	81,801	81,846	81,846
Total area location	257,512	257,557	257,557

In the 2021 reporting year, data on land consumption at the Hart site was recorded for the first time and near-natural areas of a good 5 hectares were also identified separately in this context. The natural areas are mainly rough pastures that provide a diverse habitat for various insects and other animals through targeted mowing, among other things. In the overall view, there have been no changes in 2021 compared to the previous year.

ENVIRONMENTAL PROTECTION COSTS

In 2021, environmentally relevant investments amounting to approx. € 108 k were made at the Hart site. The total expenditure for environmental protection operating costs in 2021 was approximately € 3.3 million.



The former NIGU Chemie GmbH at the Waldkraiburg site was merged with its parent company, Alzchem Trostberg GmbH, effective July 1, 2021. Around 70 people are currently employed at the Waldkraiburg site.

The site is located in an industrial area in Waldkraiburg in the district of Mühldorf am Inn. The site covers an area of approximately 1.7 hectares and is directly adjacent to the SI Group Germany GmbH site, which provides infrastructure such as water supply and disposal as well as energy for Alzchem.

ENVIRONMENTALLY RELEVANT FACILITIES AND ACTIVITIES

Two production plants, a multi-purpose plant and the so-called Bioselect® plant, are operated at the Waldkraiburg site.

The nitroguanidine produced at the Waldkraiburg site is an intermediate for the manufacture of agrochemicals. It is also used in propellant charges for airbags and seat belt pretensioners, for example.

The Bioselect® plant is primarily used to produce high-purity guanidine salts for use in biotechnology. These products are used, for example, in the extraction of DNA and RNA in molecular diagnostics, such as in the currently widely used Covid-19 PCR tests.

In addition to the production facilities, Alzchem Trostberg GmbH operates the Bioselect® technical center. It is a link between research, development and production in the establishment of new products and processes.

Location

Key figures Waldkraiburg site		2019	2020	2021
Production output dry	1000 t	5.48	4.65	6.07
Environmental indicators				
Raw material input	t/t Produkt	1.19	1.24	1.22
Steam consumption (full 16 bar)	MWh/t Produkt	7.07	6.46	5.88
Electric power consumption	MWh/t Produkt	1.13	1.31	1.04
thereof „renewable energies“	MWh/t Produkt	0.53	0.02	- *)
Water consumption	m³/t Produkt	45.9	44.8	37.0
Waste generation (production-specific) **)	t/t Produkt	0.055	0.19	0.051
thereof „hazardous“	t/t Produkt	0.042	0.19	0.048
Dust emissions	kg/t Produkt	0.015	0.004	0.005
CO ₂ emissions ***)	t/t Produkt	0.008	0.016	0.010
NO _x emissions	kg/t Produkt	0.008	0.009	0.006
Total area location	m²/t Produkt	0.0031	0.0037	0.0028
sealed surfaces	m²/t Produkt	0.0022	0.0025	0.0020

*) Value for 2021 not yet available, share of renewable electricity will only be communicated to us 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 shown in more detail in the following tables for the location.

***) related to CO₂ emissions of the site (Scope 1)

PRODUCTS

Products (in t)	2019	2020	2021
Total products	5,484	4,648	6,065

In the reporting year 2021, production volumes at the Waldkraiburg site increased significantly by 30 %. The increase was due to higher sales volumes of established products and new products manufactured for the first time.

RAW MATERIALS, CONSUMABLES AND SUPPLIES

Material efficiency, i.e. the consumption of raw materials and supplies in relation to product output, has not changed significantly at the Waldkraiburg site in the 2021 reporting period and is within the fluctuation range of previous years.

RAW MATERIALS

Material (in t)	2019	2020	2021
Raw materials	6.501	5.752	7.397

Alzchem used around 7,400 t of raw materials at the Waldkraiburg site in 2021. 58% of this was supplied by Alzchem's Schalchen site.

ENERGY

Energy (in MWh)	2019	2020	2021
Total energy	44,979	36,169	42,020
Steam	38,749	30,023	35,688
Electrical energy	6,185	6,076	6,284
thereof "renewable energies"	2,888	109	*)
Fuel	45	70	48

*) Value for 2021 not yet available, share of renewable electricity will only be communicated to us in the course of the year

84 % of the total energy consumption at the site is covered by saturated steam (16 bar). This is generated by the neighboring SI Group and delivered to Alzchem.

Although total energy consumption increased as an absolute value due to the higher production volumes, it decreased significantly by 11% in relation to the volume produced. This also applies to the individual energy sources: steam -9% and, in particular, electricity -21%. This was due on the one hand to the more favorable product mix and on the other hand to more efficient energy use as a result of higher plant utilization.

The administration building is heated with environmentally friendly steam condensate. Natural gas is only required during maintenance work on the steam and condensate network.

In order to increase the share of renewable electricity in the future and thus reduce CO₂ emissions from external energy purchases, Alzchem is currently conducting a study on the possibility of Power Purchase Agreements (PPA). This type of long-term "power purchase agreement" could make larger quantities of renewable electricity available to Alzchem for all sites in the future.

WATER/WASTE WATER

WATER

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

For optimal 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 it is extracted from the company's own wells.

The maximum industrial water withdrawal volume set by the authorities was utilized by 17% in the reporting year 2021.

Water (in m ³)	2019	2020	2021
Service Water	251.656	208.259	224.290
thereof from own well	53.449	31.998	36.988
Drinking water (administration building only)	228	289	238

Water consumption increased in 2021 in line with production output. In terms of specific water consumption, however, the picture here also shows a further decline, with 37.0 m³/t of product compared with the previous year's figure of 44.8 m³/t of product.

WASTE WATER

Waste Water (in m ³)	2019	2020	2021
not in need of treatment (direct introduction)	191.154	172.494	147.727
Operational waste water (Indirect discharge via municipal wastewater treatment plant)	35.969	30.296	30.490
Sanitary waste water (Indirect discharge via municipal wastewater treatment plant))	1.728	2.179	2.158

The majority of the wastewater produced at the site is uncontaminated cooling water, which is discharged directly into the Inn River via the so-called Muna Canal. Despite the higher production volumes, the volume was reduced by 14 % compared to 2020.

The amount of operationally polluted wastewater was reduced by a very significant 29 % in relation to the production volume. Part of the process water used by the SI Group is released into the environment in the form of water vapor through evaporation from the cooling towers and drying processes.

Pollutant loads to the municipal wastewater treatment plant (in kg)	2019	2020	2021	Utilization of limit 2021 *)
organic load	25,334	20,448	22,217	n. r. **)
Nitrogen from NO ₃ ⁻ and NH ₄ ⁻	8,950	8,130	6,574	72 %

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

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

The discharges both via the Muna canal and the indirect discharges into the municipal wastewater treatment plant are regularly monitored and analyzed by Alzchem and on the part of the authorities. The limits set for the discharges were fully complied with in 2021.

The organic load was reduced by 17% in relation to the quantity produced; the reduction in the discharge of nitrogen from nitrate and ammonium was even more significant at 38 %.

EMISSIONS

EMISSIONS TO THE AIR

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

Emissions (to air, in t)	2019	2020	2021
Dust	0,082	0,019	0,028
Nitrogen oxides (NO _x)	0,046	0,044	0,035
Sulfur oxides (SO _x)	0,020	0,002	0,001
Carbon dioxide (CO ₂) *)	45	73	60
Sulfuric acid (H ₂ SO ₄)	0,008	0,026	0,006
Nitric acid (HNO ₃)	0,015	0,029	0,005
Ammonia (NH ₃)	0,01	0,05	0,001

*) CO₂ emissions of the site (Scope 1)

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 adjoining the plant site to the north and southwest, the immission guide value to be complied with is over 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 NEIGHBORHOOD

As in previous years, there were no environmental complaints from the site's neighborhood in 2021.

WASTE

Waste (in t)	2019	2020	2021
Production-specific waste	301	903	312
of which aqueous washing liquids and mother liquors*)	180	756	208
of which other filter cakes, used absorbent materials *)	17	47	36
of which other reaction and distillation residues *)	22	39	34
Waste not specific to production	160	172	140
Total waste (production-specific/non-production-specific)	461	1,075	452
Share of hazardous waste	229	864	292
Share of recycling	160	172	141

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

Production-specific waste is mainly generated by organic chemical processes. In 2021, it again accounts for the largest share of waste (312 t) and is slightly (-6 %) below the level of 2019. The very sharp decline in production-specific waste compared with 2020 can be attributed to the fact that ammonium chloride could be recycled as a by-product in 2021 and therefore no longer had to be disposed of via the waste route.

The volume of non-production waste, which consists mainly of municipal waste (commercial waste similar to household waste), decreased by 19 % compared to the previous year to 140 tons.

The share of hazardous waste as well as the recycling rate is - after the extraordinary year 2020 - again at the level of 2019 in relation to the manufactured product quantity.

TRANSPORT

GOODS TRANSPORT

Transport volume (in t)	2019	2020	2021
Total	12,745	10,587	11,344
Streets	10,320	8,425	9,163
Rail	156	168	108
Combined	2,269	1,994	2,073

The increase in transport volume to 11,344 t in 2021 is due to the increased production volume.

The total volume of traffic at the Waldkraiburg site breaks down as follows: 81 % road, 1 % rail and 18 % "combined" (mainly road and rail; air freight only accounted for 16 tons). The high proportion of road transport is due to the large number of small delivery quantities that are transported by truck as so-called general cargo. In addition, the raw materials from the Schalchen plant can also only be delivered by road.

With the planned expanded reporting of CO₂ emissions according to Scope 2 and 3, we will also report the greenhouse gas emissions according to the GHG Protocol from our transports here in the future.

LAND CONSUMPTION

Land consumption (in m ²)	2019	2020	2021
undeveloped areas (gravel areas, lawn, green area))	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 location	17,128	17,128	17,128

There have been no changes in the use and land consumption of the site from 2019 to 2021.

ENVIRONMENTAL PROTECTION COSTS

Total expenses for environmental protection operating costs at the Waldkraiburg site amounted to approximately € 301 thousand in 2021.

IMS programm and target achievement

In the update to the IMS program 2021-2023, a total of 37 new targets and the associated measures were defined. The new targets and measures cover 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, the following is an excerpt from the update of the IMS program 2021-2023:

TROSTBERG SITE

Subject	Target/ Measure	Formulation of objectives/measures	Date
Energy	T	The share of renewable energies used at Alzchem is to be increased.	4 Q 2022
	M	In order to reduce CO2 emissions from the purchase of electricity, Alzchem is implementing a study on the possibility of Power Purchase Agreements (PPA-Agreement) to purchase larger amounts of renewable electricity.	
Biodiversity	T	The biodiversity of the various sites is to be further increased.	3 Q 2022
	M	By investigating additional near-natural areas, further individual measures for an increase in biodiversity are to be developed.	
Waste	T	The amount of aqueous waste generated in various subplants of the nitrile plant is to be permanently reduced.	4 Q 2022
	M	Through the use of reliable quantity records, especially for the feedwater, the quantities of aqueous waste in this area are to be permanently reduced by 5% in relation to the production volume.	
Process	T	The quantity of a raw material to be used in relation to the product is to be reduced in a range of the nitrile plant.	4 Q 2022
	M	A new raw material quantity measurement system should reduce the product-related input by approx. 10 %.	
Emissions	T	Fugitive emissions from raw material handling in the SC plant are to be reduced and, at the same time, occupational health and safety/ergonomics are to be improved.	3 Q 2022
	M	In the future, the delivery of a raw material is to be realized via an emission-free lock system.	

Energy	T	The replacement of a heat exchanger in the KA-plant is intended to save cooling water.	1 Q 2022
	M	The renewal of the heat exchanger should enable better heat transfer and save 100 m ³ /h of cooling water per year.	
Energy	T	The natural gas consumption of the new RTO plant is to be significantly reduced through the use of waste heat.	4 Q 2023
	M	In the future, the waste gas to be treated will be preheated by means of waste heat and natural gas consumption will be reduced by 2,975 MWh.	
Energy	T	The energy consumption in the exhaust gas measurement area of the cyanamide plant is to be reduced.	3 Q 2021
	M	This reduction is to be achieved by installing an energy-efficient la- serme- tering system, resulting in a savings of 3,200 kWh per year.	
Energy	T	Switching to LED lighting in the cyanamide plant area is expected to save energy	4 Q 2022
	M	The first step will be to install 40 new LED luminaires and aim for energy savings of 14,000 kWh per year.	
Energy	T	The energy consumption during the manufacture of a product in the GMP plant is to be significantly reduced by optimization.	4 Q 2022
	M	Continuous operation of a process is expected to save 800 MWh/a of process energy.	
Energy	T	The use of natural gas is to be reduced by recycling an exhaust gas stream containing hydrogen	2 Q 2023
	M	In the future, hydrogen-containing waste gas from a production process is to be used in a steam boiler. The amount of natural gas can thus be reduced by approx. 8,000 MWh/a.	
Energy	T	The energy input for ammonia evaporation in a production plant is to be reduced.	4 Q 2023
	M	Up to now, ammonia evaporation has been implemented using steam. In the future, hot water from the hot water network of the heat recovery system is to be used for this purpose, thus achieving energy savings of approx. 1,700 MWh/a.	

SCHALCHEN SITE

Subject	Target/ Measure	Formulation of objectives/measures	Date
Process	T	Approximately 8,500 kg/a of usable product is still to be recovered from a condensate stream.	2 Q 2022
	M	The installation of droplet separators is expected to recover > 95% of the product.	
Water	T	The amount of cleaning water in the area of the centrifuge of the DCD-plant should be reduced.	3 Q 2022
	M	The retrofit of the centrifuge is expected to save 2,400 m ³ /a of cleaning water.	
Energy	T	Energy consumption in the area of DCD and FMZ lighting is to be reduced by using more modern light sources.	4 Q 2022
	M	The use of CO ₂ liquid in the DCD plant is expected to save a fuel oil quantity of approx. 5,000 MWh/a as a target value.	

HART SITE

Subject	Target/ Measure	Formulation of objectives/measures	Date
Energy	T	The use of electricity in the production of carbide is to be reduced by adjusting the driving mode.	1 Q 2022
	M	A more uniform operation of the carbide furnaces and an optimized raw material fines rate are expected to save 7,500 MWh/a of electricity.	
Water	T	The filterable substances and in this course also the PAHs are to be further reduced in a wastewater stream.	4 Q 2022
	M	A wastewater-dependent dosing rate of a flocculant should further reduce the substances that can be filtered off.	

WALDKRAIBURG SITE

Subject	Target/ Measure	Formulation of objectives/measures	Date
Health	T	The ergonomics of feeding a raw material in the Bioselect area is to be improved.	4 Q 2022
	M	To improve ergonomics, a big-bag crusher and lifting crane is to be used. This eliminates the need for manual crushing/emptying of the raw material containers	
Energy	T	Saving cooling resources in the area of NQ filtration.	1 Q 2022
	M	Automatic temperature control for the cooling agitators is expected to save 3 % of the energy.	

VARIOUS TARGETS AND MEASURES WERE PLANNED, PROCESSED AND COMPLETED FOR THE YEAR 2021. THE FOLLOWING IS AN EXCERPT OF THE IMPROVEMENTS ACHIEVED.

TROSTBERG SITE

Subject	Target/ Measure	Formulation of objectives/measures	Edit. %	Status
Energy	T	Reduction of energy consumption in the workshop area through the use of new light sources	0	open *)
	M	The use of LED illuminants can save 37,230 kWh/a.		
Organization	T	Focusing even more on the topic of sustainability at Alz-chem and developing a sustainability strategy.	100	done
	M	Conduct a sustainability check according to the industry initiative Chemistry ³ with materiality analysis and definition of sustainability goals.		
Process	Z	Increasing the yield and reducing the emissions in a specific process step of the KA plant.	100	done
	M	With the help of a SixSigma project (process improvement system) that was carried out, the yield (raw material efficiency) was increased by only 1 %, but the emissions from the process were reduced by 60 %. In addition, an energy saving of 12,115 MWh/a was achieved, which corresponds to the annual electricity demand of more than 3,000 households		

Transport/ Traffic	T	The installation of e-car charging stations in the plant area is intended to create an incentive toward electro-mobility..	100	done
	M	In 2021, seven charging points for electric cars, which are accessible to employees free of charge, were put into operation.		
Energy	T	Energy savings in the tank farm of the cyanamide plant by optimizing the times when the tanks are mixed by electrically driven agitators.	100	done
	M	By optimizing the stirring times, the energy requirement was reduced by 56,000 kWh/a.		
Energy	T	Energy saving in the area of the bathhouse through the installation of a new drinking water pump.	100	done
	M	The installation of a more efficient drinking water pump saved 2,320 kWh/a.		
Energy	T	Reduction of the heat loss of a hall which has to be kept permanently open due to accessibility.	100	done
	M	By installing a lamella curtain cold or heat is better shielded and energy in the amount of approx. 5,000 kWh/a is saved.		

*) the measure could not be implemented by the set target date due to changed general conditions (e.g. shift of priority) and was therefore postponed

SCHALCHEN SITE

Subject	Target/ Measure	Formulation of objectives/measures	Edit. %	Status
Energie	T	Reduction of energy consumption in the workshop area through the use of new compressors	95	in process *)
	M	By using energy-efficient screw compressors, approx. 150,000 kWh/a can be saved.		

*) the new screw compressors have been installed. The exact amount of energy saved can only be derived after a runtime of 12 months.

HART SITE

Subject	Target/ Measure	Formulation of objectives/measures	Edit. %	Status
Energy	T	Energy savings in the area of the muffle burners by optimizing the operating times	50	in process *)
	M	In the future, the muffle burner is to be operated exclusively when hydrocarbon-rich secondary raw materials are used. Since these materials are not currently used, an energy saving of approx. 1.2 GWh/a is possible. The feasibility has to be clarified with the authorities.		
Energy	T	Energy saving by using a warm cooling water return for preheating domestic water	100	done
	M	In the case of granulation, the service water used is heated via a cooling water return, thus achieving energy savings of approx. 35,000 kWh/a.		
Noise	T	Improvement of the noise situation in the area of the filter system (filter 1-7)	100	done
	M	Through the installation of a silencer on a Ventilator, a noise reduction of 12 dB(A) was achieved at the noise source.		
Energy	T	Energy savings by optimizing the feed of raw materials into the carbide furnace	100	done
	M	Adjustments in the area of the raw material feeding (use of gravity instead of intermediate bunkers and mechanical transportation) will save 2,000 kWh/a of energy.		

*) the measure could not be implemented by the set target date due to changed general conditions (e.g. shift of priority) and was therefore postponed

WALDKRAIBURG SITE

Subject	Target/ Measure	Target/measure formulation	Edit. %	Status
Waste	T	Reduction of waste quantities by recycling ammonium chloride solution.	100	done
	M	For the ammonium chloride solution disposed of so far, an external recycling route was developed. As a result, the volume of waste could be reduced by 1,200 t/a.		

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.

In parallel with the validation of the 2021 Environmental Statement, Alzchem's integrated management system was again audited in accordance with the DIN EN ISO 9001, ISO 14001, ISO 27001, ISO 27019 and ISO 50001 standards.

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

In 2023 and 2024, Alzchem will prepare an updated environmental statement.

In 2025, Alzchem will prepare a consolidated environmental statement.

Trostberg, April 07, 2022

Klaus Englmaier
Management Production & Technology
Trostberg, Schalchen, Hart, and Waldkraiburg

DECLARATION OF THE ENVIRONMENTAL VERIFIER ON VERIFICATION AND VALIDATION ACTIVITIES

The undersigned, Dipl.-Ing. Ulrich Wegner, EMAS environmental verifier of TÜV SÜD Umweltgutachter GmbH with the registration number DE-V-0045, accredited for the scope 20.1 (NACE code), confirms to have verified whether the sites

- Trostberg, Dr.-Albert-Frank-Str. 32, 83308 Trostberg
- Schalchen, Trostberger Straße 95, 83342 Tacherting
- Hart, Fabrikstraße 2, 84579 Unterneukirchen und
- Waldkraiburg, Beuthener Straße 2, 84478 Waldkraiburg

as stated in the environmental statement of the organization Alzchem Trostberg GmbH, Dr.-Albert-Frank-Str. 32, 83308 Trostberg with the registration number DE- 155 00034. meet 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 by organizations in a Community eco-management and audit scheme (EMAS).

BY SIGNING THIS DECLARATION IT IS CONFIRMED THAT

the assessment and validation have been carried out in full compliance with the requirements of Regulation (EC) No 1221/2009, updated by Regulation (EU) 2017/1505 and Regulation (EU) 2018/2026,

the result of the assessment and validation confirms that there is no evidence of non-compliance with the applicable environmental regulations,

the data and information in the consolidated environmental statement of the Trostberg, Schalchen, Hart and Waldkraiburg sites give a reliable, credible and truthful picture of all the site's activities within the scope stated in the environmental statement.

This declaration cannot be equated with an EMAS registration. EMAS registration can only be carried out by a permanent body in accordance with Regulation (EC) No. 1221/2009, updated by Regulation (EU) 2017/1505 and Regulation (EU) 2018/2026. This declaration may not be used as a stand-alone basis for informing the public.



Munich, April 07, 2022

Dipl.-Ing. Ulrich Wegner
Umweltgutachter der
TÜV SÜD Umweltgutachter GmbH
DE-V-0209

IMPRINT

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PICTURES

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