



Weihenstephan

THE WORLD'S OLDEST BREWERY

Bayerische Staatsbrauerei Weihenstephan

Environmental
Statement

20
22

In accordance with EMAS III - Regulation (EC) No 1221/2009 and Commission Regulation (EU) 2017/1505

Foreword



Dear Reader,

Thank you for your interest in the Bayerischen Staatsbrauerei Weihenstephan and in our Environmental Statement. The Environmental Statement is a fundamental part of our environmental management system according to the Eco-Management and Audit Scheme (EMAS). With our Environment Statement, we would like to inform you about our company and present our performance in environmental protection in a transparent way. We would also like to explain our guidelines, aims and measures related to improving our environmental performance.

Why do we participate in EMAS? We, as the Bayerischen Staatsbrauerei Weihenstephan, consider it our responsibility to actively take part in protecting our environment in all that we do and thus contribute to the wellbeing of our society. On the one hand, we have made it our mission to apply the principles of resource efficiency and pollution prevention; on the other hand, we wish to acknowledge our responsibility to act in a sustainable and environmentally-friendly way. With the help of our environmental management system, we endeavor to constantly reduce negative environmental impacts and thus constantly work on improving our environmental performance. EMAS, as a trusted management instrument, gives us the opportunity to repeatedly put ourselves to the test by means of a kind of stocktaking. This enables us to measure our progress and to identify possible deficits and potential areas for improvement so that we can address them in the future. For us, it is extremely important to provide publicly available information on our results and we consider this to be our special duty – because we strive to ensure the highest level of transparency possible in accordance with the EMAS requirements, also in the interest of our many loyal customers.

Bayerische Staatsbrauerei Weihenstephan

A handwritten signature in blue ink, belonging to Prof. Dr. Josef Schrädler. The signature is stylized and cursive, starting with a large 'J' and ending with a long, sweeping tail.

Prof. Dr. Josef Schrädler
Director

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1. Company profile and site description

1.1 Company profile

Bayerische Staatsbrauerei Weihenstephan, founded as a monastery brewery by the Benedictine monks in the year 1040, is today a state-owned company that is run according to private sector standards. A look behind the historic brewery walls reveals modern technology that draws on state-of-the-art scientific findings in beverage technology. Traditional brewing methods together with almost 1000 years of experience result in premium beers of the highest quality that are honored with the most sought-after awards in international beer competitions year after year.

Meanwhile the company has more than 170 employees at two sites – in the brewery itself and in the logistics center.

It is essential for our environmental statement to separate the brewery and logistics sites from each other in order to ensure an honest representation. The separate views mean that energy and electricity consumption can be calculated more accurately and for each site individually. This should not give the impression, however, that the logistics center is an independent company; it is simply a part of the brewery that is located at a different site.

The product portfolio of the Bayerische Staatsbrauerei Weihenstephan comprises 14 year-round beer specialties and two seasonal beers. The brewery is particularly well known for its Hefeweißbier, available worldwide in more than 50 countries.



1.2 The brewery

Address	Alte Akademie 2, 85354 Freising
Land area	52,963 m ² , near-natural area thereof 1,200 m ²
Headcount	146
Environmentally relevant systems	<ul style="list-style-type: none"> - Mash house (emissions: noise and particulate matter) - Boiler systems - Refrigeration systems (ammonia) - Hazardous materials storage/AwSV fuel station - In-company logistics (fork-lift trucks)
Site activities	Production of beer (according to NACE Code 11.05)

The Bayerische Staatsbrauerei Weihenstephan stands on the Weihenstephan hill in Freising, in the middle of the Technical University of Munich campus. As a state-owned company, it belongs to the Free State of Bavaria and is under the responsibility of the Ministry of Science and Art.

The brewery is split into several levels: administration and mash house are located at the highest point, the fermenting and maturation cellars a little way down the hill. The packaging system stands a little further down, next to the kegging and bottling cellar. Important operating equipment here is, for example, the gas-fired steam boiler for heating the mash house as well as the ammonia refrigeration system with an evaporative cooler.

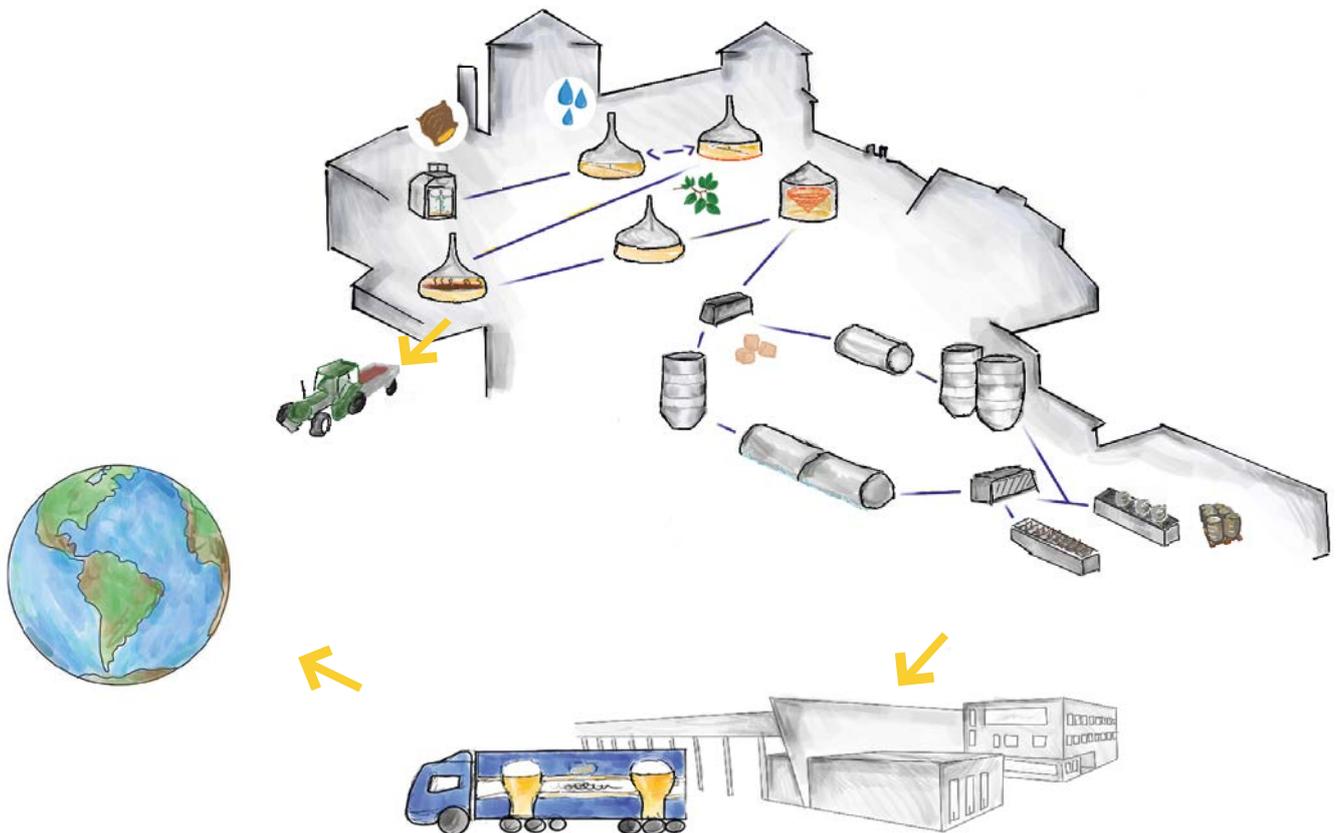
The brewery is a facility requiring approval in the sense of the Federal Emission Control Act. An increase in production capacity is approved for up to 2520 hl/day on a quarterly average and falls according to fourth Federal Emission Control Act (4. BImSchV) Annex 1 under 7.27.2.



1.3 The logistics center Weihenstephan

Address	Clemensänger-Ring 17, 85356 Freising
Land area	23,489 m ² , near-natural area thereof 11,974 m ²
Headcount	27
Environmentally relevant systems	<ul style="list-style-type: none"> - Oil separators - Heat pumps - In-company logistics (fork-lift trucks)
Site activities	<p>Storage, picking and loading of products</p> <p>Supplying the brewery with materials</p>

After years of planning, the time had finally come in May 2019: the logistics center of the Bayerische Staatsbrauerei Weihenstephan was opened in the industrial park Clemensänger in Freising-Lerchenfeld. Behind this decision was the need to alleviate the situation at the site on the Weihenstephan hill, where beer crates were piled up to the roof. To meet the increasing demand for Weihenstephan beer specialties, a state-of-the-art storage facility for beer and a high-bay warehouse for equipment were built. Because the majority of sales are made ex works, the site directly at the A92 highway was a perfect choice.



A schematic of the beer brewing process

To supply the logistics center with freshly filled goods, a sophisticated shuttle system using three trucks was introduced. On a daily basis, full crates and kegs are exchanged with empties and other materials required, such as new glass or bottle caps. Customers have easy access and can conveniently pick up the beer without touching urban traffic. The traffic situation on the Weihenstephan hill has greatly improved as a consequence.

The entire energy supply in the logistics center, including the heat pumps, is provided by 100% green electricity. Additionally, the building is prepared for installing photovoltaic systems and the energy-efficient floor temperature control system guarantees an optimal storage temperature the whole year round to ensure a high beer quality.

All these measures have led to the logistics center becoming the most modern and optimized building owned by the Weihenstephan brewery.

The newly available free space at the brewery was put to a new purpose. By installing a packaging facility, the brewery now has all processes – from brewing to selling ex warehouse – in its own hands and no longer has to depend on service providers. Accordingly, the brewery can better assess and optimize its own environmental performance.



2. Environmental policy

As the oldest brewery in the world, the Bayerische Staatsbrauerei Weihenstephan can look back with pride on almost 1000 years of brewing tradition. This awareness for tradition on the one hand and the continual striving for modernization and renewal on the other, form the cornerstones of our success. We have defined the principles of action for the sustainable development of our company in our environmental policy and we communicate our environmental policy not only to our employees, but also to customers, suppliers and service providers.

Our environmental policy is:



1. Sustainability

We see sustainable management as a key factor for responsible and future-oriented action and implement this in all areas of the company.



2. CO₂ neutral production

Our aim is to continue saving and avoiding CO₂ in the whole production process. We offset unavoidable emissions by means of compensation projects and are already CO₂ neutral for Scope 1 and Scope 2. We also strive to make our processes as resource-friendly as possible while ensuring a high material efficiency.



3. Promoting the region and protecting the environment

As a medium-sized brewery with regional roots, we also consider it our duty not only to work in an environmentally-friendly way, but also to promote the region. By supporting regional climate and social projects, we wish to make our contribution to sustainability.



4. Commitment to improving our environmental performance

Working on continuous improvements is not only anchored in our quality management; we also want to do this for our environmental impact. We commit therefore to continually optimizing our environmental performance.



5. Legal regulations

Complying with applicable legal stipulations in the areas of environmental and occupational safety is a minimum requirement for us. Avoiding environmental pollution goes without saying.



6. Employee training

By providing training for our employees, we not only ensure occupational safety, but also promote ecological awareness.



7. Preserving nature

The most important goal for us is to preserve nature and thus ensure the future supply of high-quality raw materials. To this end, we make available the required financial means for environmentally-friendly action.

3. Activities for environmental and climate protection

Environmental protection is not a new topic in the Weihenstephan brewery. Over the past 30 years already, the brewery repeatedly strove to act in a more environmentally friendly way. The time referred to was from 1989 to 2019 – the time therefore before the environment management system was introduced.

It is especially important to mention here that our raw materials have always been sourced locally. Our water comes from the Isar wetlands and is treated by the Freising municipal utilities and then by us. Our hops come exclusively from the Hallertau, the largest contiguous hop-growing region in the world, and the malt is produced from Bavarian barley and Bavarian wheat.

The brewers grains, malt dust and surplus yeast produced during the brewing process is supplied to regional farmers for further use. As in the case of raw materials, partnerships have developed, sometimes over decades, so that our by-products can be used as animal feed and does not have to be disposed of. We have had these by-products certified especially for use as feedstuff in order to be able to provide farmers with a safe and high-quality product.

Putting foils on our bottles was abolished and in 2014 we even purchased a new bottling system with improved energy efficiency and lower water consumption.

The brewery's lighting system has also been replaced over the years. We have not only installed motion sensors, but have also fitted LED lamps in all new areas.

A further major project of the brewery was to install an ethanol collection tank, which collects alcohol arising from producing non-alcoholic beers. Wastewater pollution caused by the ethanol is thus prevented and can even be collected by companies for further use as high-quality food alcohol.

In terms of processes, Weihenstephan has also introduced a new ordering system that optimizes delivery routes and order quantities. In addition to this, a more efficient and optimized route planning for catering deliveries guarantees the saving of resources.

Changes have also been made regarding water consumption: a new program in the process control system now ensures accurate data capture of water consumption.

It is also planned to further expand e-mobility. Both the vehicle fleet and the shuttles that run between the brewery and the logistics center should also be powered with electricity. Its feasibility is currently being assessed - and hopefully the idea will soon be implemented.

Additionally, installation of photovoltaic systems will also be initiated this year. In the first phase, unlisted parts of the brewery site will be built on. It was possible to find two suitable roofs that together make up an area of almost 2,500m², which results in a power output of 500 kWp (Kilowatt peak). In the logistics center, the 2,000 m² area that was already prepared during the construction phase can now also be equipped with a PV system that delivers an output of 400 kWp. These systems are planned to produce electricity for the brewery's own consumption with the option of grid feed-in for any excess. This means that the State Brewery will now be in a position to generate renewable energy itself.

4. Environmental Management System

To take one step further and be able to better measure our environmental performance and communicate it to the outside world, we decided to introduce the environmental management system EMAS. This was set up according to the guidelines of the currently valid EMAS Regulation 1221/2009 (EMAS III).

By means of this eco-management system (EMS), we are able to systematically define and review our environmental aims and can thus manage our environmental policy in a more environmentally-friendly way long term. The environmental management system encompasses all brewery operations.

All department managers heads communicate regularly to develop joint measures that serve to achieve our environmental aims. These measures are documented in the environmental program with deadlines and responsibilities.

The environmental management manual serves to document processes and responsibilities. An environmental management officer has been appointed in the company as the person mainly responsible for environmental protection.

The success of a management system, however, depends on involving all employees. Responsible actions are ensured by means of regular training and instruction. This guarantees optimal implementation in daily work. Employees can actively participate in operational environmental protection thanks to a suggestion system for improvements.



5. Compliance with legal regulations

External requirements for our brewery and our environmental management system are defined in particular by the legal stipulations applicable to us as well as by standards based on EMAS. Regarding legal requirements, we have identified which laws and regulations as well as specifications and notices are relevant for us and how they affect us. These were documented in a legal register and are continuously reviewed. We obtain the required information via the IHK (chamber of commerce) newsletter as well as through close contact to the relevant offices, enabling us to assess the changes applicable to us. In addition, we also check legal stipulations in the course of our annual legal check within the internal audit. In this way, we can ensure that new requirements affecting us are implemented through suitable measures.

Among the relevant laws and regulations, the Federal Emission Control Act, the Federal Water Act, the Ordinance on Facilities for Handling of Substances that are Hazardous to Water and the Ordinance on Hazardous Substances are of particular importance for our brewery. We comply with all applicable environmental stipulations.



6. Environmental aspects

Environmental aspects are those aspects of the brewery that, as a producing business enterprise, have positive or negative effects on the environment. Fundamentally, we differentiate between direct and indirect environmental aspects. Our direct environmental aspects are, for example, the energy, emissions or water consumption. They arise as a direct result of production and the related brewery processes as well as those of the logistics center and are within our control and influence. Indirect environmental aspects occur indirectly through our activities, aspects that are not fully within our control. Examples are employee traffic or the purchasing of products and in this case, we take the opportunity of promoting environmentally-friendly awareness.

We assess the environmental relevance of our aspects by means of a scheme based on the following three criteria: quantitative significance, projected future development and the potential risk for the environment.

In addition, the control potential of the single aspects is considered in order to formulate specific environmental aims. Monitoring the environmental aspects enables us to discover weak points, exploit potential for improvement and derive our environmental activities from them.

As a reference figure for our data collection, we have decided to base our calculations on produced hectoliters of beer because this benchmark best reflects our activity. A hectoliter corresponds to 100 liters, or 100 "Maß" of beer.

KPIs	Unit	2017	2018	2019	2020	2021
Reference values						
Production beer	Hectoliter [hl]	435,672	453,471	453,070	357,647	406,411
Headcount	Number	147	155	167	176	173

6.1 Direct environmental aspects

We have identified the following KPIs as the most important direct environmental aspects with the greatest environmental impact. These are also the so-called core indicators of the environmental management system.

6.1.1 Energy consumption

When producing beer, energy is needed for the single process steps. On the one hand, thermal energy is used, which is generated by a natural gas fired steam boiler. On the other hand, refrigeration is supplied by an ammonia refrigeration system using glycol, a food grade refrigerant.

Fuel consumption is assigned to logistics as a whole because that is where we manage the fleet. To reduce fuel consumption, the company fleet is being converted to hybrid vehicles. Optimized routes are exploited in the case of truck fuel consumption, keeping it as low as possible. Shuttle transports between brewery and logistics center are organized in such a way that shuttles only run when fully loaded.

Our total renewable energy consumption is equal to our electricity consumption because we purchase 100% green electricity.

The increase in direct energy consumption results from the increase in heat consumption. This can be explained by a number of different factors. The share of non-alcoholic beer, which is more energy intensive to produce, is one of these contributory factors. In addition, the shift in output to the bottle area has an impact because the bottle washing machine is a heat consumer. The current uncertainties of our times mean it is more difficult to plan production and it was not possible to operate the brewhouse as efficiently as in normal operation. We are using this occasion to identify further measures for savings and are continually working on weak spots. Our specific heat consumption is nevertheless 6% below the industry average for our brewery size.

The following table shows the single consumption values for the last few years. Our electricity consumption was again a few percentages below the industry average for a company of our size in 2021. This is a result of the savings measures in the last years. Nevertheless, further measures are planned here.

		2017	2018	2019	2020	2021
Energy Brewery						
Total direct energy consumption per hl	kWh/hl	40.01	39.33	41.14	40.77	41.95
Electricity consumption per hl	kWh/hl	8.68	8.24	8.66	9.85	9.10
Heat consumption per hl	kWh/hl	30.92	31.04	32.44	30.70	32.72
Total consumption of renewable energy per hl	kWh/hl	8.68	8.24	8.66	9.85	9.10
Energy Logistics Center						
Electricity consumption incl. heat pumps per hl	kWh/hl	0	0.10	0.54	0.76	0.65
Fuel consumption per hl	kWh/hl	1.54	1.54	2.01	1.86	1.62

6.1.2 Water

Water constitutes the largest share of raw materials in beer. This means that our production consists of roughly 95 % water. Accordingly, it is not only one of the most important raw materials for us, but its consumption is also increased compared to other resources. The second significant consumption of water results from cleaning pipes and systems as water is used as a carrier for detergents. There is potential for savings here too and this is constantly being optimized. The consumption values are back to normal operating level. The measures defined for saving water will not show their effects until the following year.

In addition, our wastewater is constantly monitored and its condition determined by means of temperature and pH testing. By measuring the chemical oxygen demand (COD) we can determine the input of oxidizable substances into the wastewater. The wastewater is discharged into a balance tank of the Technical University of Munich. In future, construction of a collection tank for ethanol will result in a lower pollution of the wastewater through organic substances.

As there is almost no water consumption at the logistics center, the figures here are very low.

		2017	2018	2019	2020	2021
Water brewery						
Water consumption per hl	hl/hl	5.58	5.52	5.74	5.68	5.75
Wastewater	hl/hl	3.73	5.52	4.62	4.90	4.90
Water logistics center						
Water consumption per hl	hl/hl	0	0	0.01	0.01	0.01
Wastewater	hl/hl	0	0.0003	0.008	0.008	0.0066



6.1.3 Waste

Residual material from beer production constitutes the largest part of our waste and this can be recycled as valuable feedstuff for animals. The residue brewers grains and malt dust produced in the mash house result in 100% certified feedstuff. This is primarily fed to dairy cows. The surplus yeast from fermentation and maturation is a nutrient-rich feedstuff for pigs. These by-products, which would otherwise have to be disposed of, are thus part of the circular economy and enable us to achieve a recycling quota of more than 90 %. Other recyclable materials such as old labels, broken glass and crates or foils have been sorted by us for years and disposed of with the corresponding waste code in order to be transferred for recycling depending on the material type. For many years, we have been working with two waste disposal companies who are dependable partners for recycling.

Since 2019, the repackaging of our products for export is no longer outsourced and more cardboard waste is generated internally as a consequence. Integration into our production processes enables us, however, to more effectively monitor the sorted disposal and material efficiency.

In our bottling operations for the German market, we exclusively use reusable goods consisting of three different bottle shapes. Broken bottles or those with signs of wear must be sorted out here after a certain time; these are collected separately and the glass waste is transferred for recycling.

The following shows an overview of our waste generation over the years.

		2017	2018	2019	2020	2021
Waste brewery						
Total waste per hl	kg/hl	0.84	0.85	0.99	1.01	0.77
Total hazardous waste per hl	kg/hl	0.0035	0.0015	0.0012	0.0013	0.0029
Waste glass	kg/hl	0.44	0.46	0.51	0.50	0.33
Waste logistics center						
Total waste per hl	kg/hl	0	0	0.07	0.05	0.04
Total hazardous waste per hl	kg/hl	0	0	0.003	<0.001	0

6.1.4 Material usage

Besides raw materials, detergents and packaging are the most important materials. As our brewery mainly works with reusable items, we consider here the use of detergents. Regarding paper, all parts of the enterprise are taken into account.

Consumption of cleaning agents fell again in 2021 due to an increase in production volume. We are nevertheless continuously working on this topic to identify savings potential and to use these resources in accordance with the minimum principle.

In the logistics center there is no material consumption for production because only finished goods are received and shipped here. Besides the storage areas, there are also administrative offices on site, where the paper consumption per employee in the logistics center can be used as a key indicator for material.

		2017	2018	2019	2020	2021
Material usage brewery						
Caustic soda per hl	kg/hl	0.81	1.03	0.98	1.30	1.09
Detergent	kg/hl	0.36	0.32	0.34	0.46	0.38
Material usage logistics center						
Paper	Sheets per employee annually	0	0	164	156	171
Material usage of whole company						
Paper	Sheet per employee annually	2,721	2,581	2,395	2,273	2,312

6.1.5 Emissions

Pollutant, noise and odor emissions impacting the environment arise both from using energy and from the production process. Organizational measures, process optimization and using the respective state-of-art technology help us to minimize these emissions or – when possible – to avoid them completely. By using green electricity in the brewery, we could save roughly 1950 t of CO₂ emissions in 2021. The logistics center’s energy supply has zero emissions thanks to using renewable electricity. By relocating the packaging system to the brewery’s own premises, long delivery routes to the external packaging service provider could also be saved. The increase in emissions resulted from the higher heat energy demand and the related natural gas consumption.

		2017	2018	2019	2020	2021
Emissions brewery						
Greenhouse gas emissions per hl	tCO ₂ eq/hl	8.08	8.04	8.01	7.67	8.46
Total emissions into the air per hl						
SO₂ per hl	g/hl	0.42	0.36	0.37	0.38	0.38
NO_x per hl	g/hl	5.48	5.44	5.81	5.51	5.70
PM per hl	g/hl	0.23	0.23	0.25	0.23	0.24
Emissions logistics center						
Greenhouse gas emissions per hl	tCO ₂ eq/hl	0	0.0	0.45	0.40	0.34
Total emissions into the air per hl						
SO₂ per hl	g/hl	0	0.0	0.0	0.0	0.0
NO_x per hl	g/hl	0	0.0	0.0	0.0	0.0
PM per hl	g/hl	0	0.0	0.0	0.0	0.0

6.1.6 Biological land use

There is very limited space at our site on the Weihenstephan hill and this leaves little room for creating near-natural areas. When building the logistics center, special attention was therefore given to a compensation area created on site and care is taken here to leave the land as natural as possible, thus creating a habitat with sufficient food supply for bees and other insects.

		2017	2018	2019	2020	2021
Land use related to biodiversity – brewery						
Total land use per year	m ²	52,396	52,396	52,396	52,396	52,396
Total sealed land per year	m ²	51,196	51,196	51,196	51,196	51,196
Total near-natural land at the site per year	m ²	1,200	1,200	1,200	1,200	1,200
Land use related to biodiversity – logistics center						
Total land use per year	m ²	0	23,489	23,489	23,489	23,489
Total sealed land per year	m ²	0	11,515	11,515	11,515	11,515
Total near-natural land at the site per year	m ²	0	11,974	11,974	11,974	11,974

6.2 Indirect environmental aspects

We have assessed the following issues as the most important indirect environmental aspects:

6.2.1 Purchasing of raw materials

Our raw materials are water, malt, hops and yeast. We source our water from the Freising municipal utility company that treats groundwater from the Isar wetlands. Our yeast is a pure culture that we obtain from the neighboring Research Center Weihenstephan for Brewing and Food Quality. When selecting our barley and wheat malt, we pay special attention not only to the quality, but also to the origin. Here, we work exclusively with Bavarian maltsters. We source our hops mainly from growers in the Hallertau with whom we have had contracts for many years. The world’s largest hop growing region lies only 20 km away from the brewery, which gives us the chance to inspect the harvest on site every year and maintain a close relationship to our hop growers. We have generally maintained close relationships to growers and maltsters for decades. This means that not only our partners, but also we have certainty in terms of prices and harvest sourcing.

6.2.2 Purchasing of goods

When procuring our materials, we pay special attention to supply chains. Here, long-term partnerships with our suppliers are also important for us. When we assess the environmental impacts, delivery distances, production as well as the environmental behavior of the individual partners are evaluated. When sourcing materials, we also always prefer the more environmentally-friendly option where it is possible and makes sense.

6.2.3 Employee mobility

Raising awareness among the brewery employees for more sustainable and environmentally-friendly mobility options is achieved, for example, through the social project "ohne autoMOBIL" (mobile without a car), which offers company bike solutions. The vehicle fleet is being converted to hybrid vehicles step by step and our pool car is an e-car that employees can use for driving to the logistics center or for business appointments.

The newly introduced “Job Bike“ system is extremely popular with employees – some switching to bikes shortly after the model was introduced.



Pool vehicle with e-drive, in operation since 2017

6.2.4 Social projects and supporting the region

As a medium-sized brewery with regional roots, we are committed to promoting social projects in the region and, above all, to supporting environmental projects at the site.

Environmental projects:

- Participation in a planting project to mark the 50th anniversary of Weihenstephan Triesdorf University of Applied Sciences (HSWT), which is also certified according to EMAS. With the so-called "tree sponsorship", an arboretum is being planted at the foot of the brewery. For every tree planted, the Mountain Forest Project is supported with 1,000 more trees.
- Supporting Pure Water for Generations e.V.
Core topics are the renaturalization of streams and rivers and so-called "water-education", where attention is drawn to water and water courses.

Social projects:

- Promoting culture through sponsoring, for example, the creative acting ensemble KSE Freising
- Donation to people in need ("Menschen in Not") – a project for needy people in the district
- Sponsoring sports clubs (for example SV Vötting)
- Sponsoring running events to promote healthy exercise (GENERALI MUNICH MARATHON, BIG Run, Folk Festival Run)



Tree sponsorship with HSWT

7. Environmental aims and measures

In accordance with our important environmental aspects and the resulting fields of action, we have derived specific environmental aims. Practical implementation of these aims takes place through measures that we are constantly reviewing in the sense of a continuous improvement of our environment protection. Our environment program documents the status of the planning and implementation. It defines measures, deadlines and designated persons responsible for each field of action and is shown below in a consolidated form.

Environmental program 2021-2024

Environmental aspect	Area
Emissions	Whole brewery
Energy, electricity and water	Production
Energy, electricity and water	Production
Energy	Mash house
Energy	Mash house
Energy	Mash house
Energy	Mash house
Energy	Heat production
Energy	Logistics center
Energy	Brewery building
Energy	Brewery building
Water	Production
Water	Production
Water	Fermenting and maturation cellar
Water	Bottling cellar
Water	All employees
Electricity	Whole brewery
Electricity	Whole brewery
Electricity	Whole brewery
Electricity	Whole brewery
Energy	Production
Energy	Brewery building
Material	Production
Material	Production
Material	Production
Material	Production
Material	Administration
Material	Administration
Material	Production
Material	Advertising material
Improvement of EMS	Production
Improvement of EMS	Purchasing

Aims	Measures	Deadline
CO₂-neutral production	Avoidance, savings and compensation	2022
Assessment compared to the industry	Participation in company comparison for energy to detect savings potential	Continuous
Reduction of water, electricity and energy costs for filtration, lower beer losses	Installation of a new filtration system	Start 2022
Energy savings of 4% from 2019-2024	Mash house measures	2021-2024
Installation of new thermal energy meter	Detailed data to evaluate the thermal energy consumption	2023
Energy savings in the mash house	Hot water savings by optimizing wort cooling	2022
Energy savings in the mash house	Assessment additional energy storage	2023
Overhaul of boiler house	Assessment CHP and options	2023
Generation of hot water or own electricity	Assessment photovoltaic systems	2022
Roof surfaces brewery building	Assessment photovoltaic systems	End of 2023
Savings in heating consumption	Assessment ceiling insulation	End of 2023
Water savings of 9%		2021-2024
Process water	Optimization of the CIP cleaning settings	2021-2024
Process water	Review of process control system discharge volume	2021-2024
Bottle washer	Optimization of water consumption	2021-2024
Saving water	Employee training on saving water	2022
Electricity savings of 1 %		2021-2024
Electricity savings	All illuminants replaced by LED	By 2024
Electricity savings	Internal campaign to save electricity in the office	2022
Electricity savings	Future purchases with a view to energy efficiency	Continuous
Resource savings fork-lift gas	Training on minimization of fuel consumption	2022
Own electricity production	Construction of photovoltaic system	2022
Improved data capture		2021
Increased material efficiency	More accurate label orders/fewer changes/ Using up old stock	2022
Increased material efficiency	Cardboard boxes	2022
Detergents	Optimization of cleaning in cooperation with the suppliers for detergents	From 2020
Resource savings paper	Digitalization of existing processes	From 2021
Resource savings paper	Digital invoicing and dunning	2023
Reduction of packaging material	Foil wrapping of kegs should be abolished	To be defined
Consumables	Purchasing of more environmentally-friendly materials	From 2021
Improved data capture in material consumption	New interface between MES and ERP	From 2020
Supplier survey environmental performance	Assessment by means of environmental performance questionnaire	From 2022

8. Offsetting emissions

The way to CO₂-neutral production

Our approach aims to achieve CO₂ neutral production and this foresees, as a first step, avoiding all emissions that can be avoided, reducing all emissions that are within our control and compensating the unavoidable emissions. The principle is to take responsibility for action. We therefore fully compensate Scope 1 and Scope 2 emissions and are CO₂ neutral in this respect. From Scope 3 we offset the emissions from freshwater consumption because water serves as the raw material for our beers. We proceed as follows:

1. Calculation of CO₂ equivalents for the year 2021

The emissions considered were calculated according to GEMIS 5 with upstream processes. These calculation factors can be found in the annex. Below, the breakdown according to the Greenhouse Gas Protocol is described:

Scope 1 Direct emissions

Emissions resulting from consumption of natural gas and heating oil
 Fleet vehicle fuels: company cars, trucks, fork-lift trucks
 Refrigerants

Scope 2 Indirect emissions from purchased electricity

Electricity is 100% green electricity and therefore has no emissions

Scope 3 Upstream and downstream value chain

Water, essential for us as the most important ingredient of beer
 Fuel and energy-related emissions from natural gas included
 (calculated according to GEMIS 5.0, therefore with upstream processes)

Emissions	Tons CO ₂ equivalents
Natural gas consumption	3270
Heating oil	16
Fuels	137
Refrigerants	15
Electricity	0
Water	77
Total CO ₂ equivalents in tons	3515

2. Compensation of CO₂ emissions through a myclimate.org project

For the offset for the year 2021, we have selected a project that focuses on cleaning and saving water. This is part of the "Gold Standard VER (Voluntary Emission Reductions)" and has received several awards. Not only CO₂ emissions are avoided, but it also has an additional social benefit. We work together with myclimate.org, which is a recognized partner for climate protection and certificate cancellation.

Ceramic filters for clean drinking water in Laos

Roughly 30 percent of the population in Laos has no access to clean drinking water, which is why water has to be boiled regularly in order to disinfect it. The people there normally use fossil fuels or wood from non-sustainably managed forests for this – and some cannot even afford that.

This climate protection project produces ceramic water filters locally, thus providing the rural population in Laos with safe access to clean drinking water. Reduced deforestation means that CO₂ remains bound and local forest ecosystems are protected. Thanks to the project, risks of diarrheal diseases and exposure of women and children to indoor air pollution are reduced and the economic situation of households is improved.



9. Validity declaration

Umwelterklärung

Die nächste konsolidierte Umwelterklärung wird spätestens im November 2024 zur Validierung vorgelegt.

Die nächste aktualisierte Umwelterklärung wird spätestens im November 2023 dem Umweltgutachter zur Validierung vorgelegt.

Umweltgutachter / Umweltgutachterorganisation

Als Umweltgutachter/Umweltgutachterorganisation wurde beauftragt:

Dr.-Ing. R. Beer (Zulassungs-Nr. DE-V-0007)
Intechnica Cert GmbH (Zulassungs-Nr. DE-V-0279)
 Ostendstr. 181
 90482 Nürnberg

Validierungsbestätigung

Der Unterzeichnende, Dr. Reiner Beer, EMAS-Umweltgutachter mit der Registrierungsnummer DE-V-0007, akkreditiert oder zugelassen für den Bereich 11.05 (NACE-Code Rev. 2) bestätigt, begutachtet zu haben, ob der Standort bzw. die gesamte Organisation Bayerische Staatsbrauerei Weihenstephan, Alte Akademie 2, 85354 Freising und Clemensänger-Ring 17, 85356 Freising wie in der aktualisierten Umwelterklärung (mit der Registrierungsnummer: DE-155-00354) angegeben, alle Anforderungen der Verordnung (EG) Nr. 1221/2009 des Europäischen Parlaments und des Rates vom 25. November 2009 und Änderungs-VO 2017/1505 vom 28.08.2017 und 2018/2026 vom 19.12.2018 über die freiwillige Teilnahme von Organisationen an einem Gemeinschaftssystem für Umweltmanagement und Umweltbetriebsprüfung (EMAS) erfüllt.

Mit der Unterzeichnung dieser Erklärung wird bestätigt, dass

- die Begutachtung und Validierung in voller Übereinstimmung mit den Anforderungen der Verordnung (EG) Nr. 1221/2009 und Änderungs-VO 2017/1505 und 2018/2026 durchgeführt wurden,
- das Ergebnis der Begutachtung und Validierung bestätigt, dass keine Belege für die Nichteinhaltung der geltenden Umweltvorschriften vorliegen,
- die Daten und Angaben der aktualisierten Umwelterklärung der Organisation / des Standortes ein verlässliches, glaubhaftes und wahrheitsgetreues Bild sämtlicher Tätigkeiten der Organisation/ der Standorte innerhalb des in der Umwelterklärung angegebenen Bereichs geben.

Nürnberg, 02.09.2022



Dr.-Ing. Reiner Beer
 Umweltgutachter

10. Annex

10.1 Overview of absolute consumption data

Energy
Electricity
Whole company
Brewery
Logistics center (LGC)
Oil
Gas
Liquid gas
Diesel
Gasoline
Total direct energy consumption
Total consumption of renewable energy
Total generation of renewable energy
Material/ Raw materials
Paper
Refrigerants
Caustic soda 50%
Detergents and disinfectants
Belt lubricant
Malt
Water
Fresh water brewery
Fresh water LGC
Wastewater brewery
Wastewater LGC
Total water consumption
Waste brewery
Waste for recycling
Paper, cardboard boxes
Waste glass, color-pure
Waste labels
Foils
Diatomaceous earth
Wood
Total hazardous waste

Unit ¹	2017	2018	2019	2020	2021
MWh	3782	3784	4169	3795	3964
	3782	3737	3925	3523	3698
	0	47	244	271	265
MWh	175.22	19.30	15.22	77.91	50.00
MWh	13,473	14,077	14,697	10,978	13,297
MWh	1.42	1.50	2.07	2.07	1.71
MWh	619.11	616.15	837.06	631.22	624
MWh	49.94	83.09	75.52	33.43	34
MWh	17,431	17,835	18,640	14,581	17,047
MWh	3,782	3,784	4,169	3,795	3,964
MWh	0	0	0	0	0
Sheets	400,000	400,000	400,000	400,000	400,000
kg	x	8.2	7.2	13	7.1
t	352,2	465	444	406	397
t	155	166	156	121,43	137
t	4.6	3	4	5.4	4.8
t	7,724	8,365	8,194	6,420	7,321
m ³	243,062	250,442	259,934	203,133	233,789
m ³	0	12	338	282	268
m ³	162,402	250,442	209,343	175,243	198,949
m ³	0	12	338	282	268
m ³	243,062	250,454	260,272	203,415	234,057
t	44.01	46.25	60.40	50	51.2
t	21.19	22.09	48.42	42	44.2
t	190.44	210.62	231.69	177	132.9
t	46.15	47.32	43.18	41	40.6
t	27.18	29.45	24.35	25	25.1
t	24.84	16.79	24.12	18	14.5
t	10.68	11.77	14.28	8	3.3
t	1.50	0.67	0.53	0.48	1.2

10.1 Overview of absolute consumption data

Waste logistics center (LGC)		
Waste for recycling		
Paper, cardboard		
Foils		
Wood		
Total hazardous waste		
Land use in relation to biodiversity		
Total land use brewery		
Total sealed land brewery		
Total near-natural area brewery		
Total land use LGC		
Total sealed land LGC		
Total near-natural year a the LGC site		
Emissions		
Greenhouse gas emissions		
Total emissions into the air		
SO ₂ brewery		
NO _x brewery		
PM brewery		
SO ₂ LGC		
NO _x LGC		
PM LGC		

10.2 Applied emissions factors

Conversion factors according to GEMIS 5.0 incl. upstream chain			CO_{2eq}
Green electricity according to invoice	g/kWh		0
Natural gas	g/kWh		245.90
Heating oil	g/kWh		317.07
Diesel	g/kWh		204.13
Gasoline	g/kWh		236.23
Liquid gas	g/kWh		276.73
Water	g/kg		0.33

Unit ¹	2017	2018	2019	2020	2021
t	0	0	5.50	7.50	7.50
t	0	0	3.20	13.32	1.40
t	0	0	3.06	4.80	3.80
t	0	0	7.62	4.78	2.42
t	0	0	1.27	0	0
m ²	52,396	52,396	52,396	52,396	52,396
m ²	51,196	51,196	51,196	51,196	51,196
m ²	1,200	1,200	1,200	1,200	1,200
m ²	0	23,489	23,489	23,489	23,489
m ²	0	11,515	11,515	11,515	11,515
m ²	0	11,974	11,974	11,974	11,974
tCO ₂ eq	3,518,539	3,644,172	3,836,610	2,889,119	3,514,811
kg	180.89	163.15	168.89	134.80	152
kg	2,386.80	2,466.32	2,632.56	1,969.57	2,315
kg	98.62	104.75	112.85	82.65	96
kg	0.00	0.00	0.05	0.05	0.05
kg	0.00	0.00	0.09	0.09	0.10
kg	0.00	0.00	0.01	0.01	0.01

¹The direct greenhouse gas emissions are expressed as CO₂ equivalents. Each relevant greenhouse gas has a different contribution to the greenhouse effect and is converted by means of a Global Warming Potential (GWP = greenhouse gas potential). The most well-known greenhouse gas, carbon dioxide (CO₂), serves as comparative value.

SO ₂	NO _x	PM
0	0	0
0.010	0.157	0.006
0.189	0.210	0.023
0.007	0.334	0.022
0.16	0.18	0.05
0.081	0.154	0.016



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