2021

Hops. People. Home.

Sustainability Report

Your German Hopportunity!

HVG - We are the growers!

The best way for brewers to guarantee themselves fair and transparent conditions is to buy directly from the grower. HVG is the world's largest association of hop growers in a single cooperative.

Hop growing unites our members across the generations. To us, hops represent a sense of home. Family-run farms in the three largest German hop-growing regions of Hallertau, Tettnang and Elbe-Saale cultivate this particularly labour-intensive crop with loving care, dedication and respect for the environment.

Every batch of hops can be traced back in full and with official certification to a particular hop farm. Owing to our unique role as a grower association, which means we are familiar with every aspect of hop-growing, and because of our role as a hop processor and an international sales service provider for growers, we are a reliable and competent partner for breweries.

Contents

Page

German-grown hops are a sought-after ingredient all over the world. Growing hops should offer good prospects for future generations too.

Foreword

We attach great importance to sound and sustainable management, cooperation in a spirit of partnership and transparent information flows.

"Hops, people, home".

_____ Wherever hops have a home, they leave their mark not only on the landscape but also on the people and their culture. There is documentary evidence of hop cultivation in Germany dating back more than 1,000 years. German hops are always present in the public perception due to their immense importance in the production of beer and as a raw material that is in demand all over the world.

We are currently in the midst of an undeniable climate crisis. Average temperatures are rising due to greenhouse gas emissions and increased land use. The effects are also increasingly noticeable for hop growers. Long heat waves result in crop losses or even failures, as was recently the case in 2015.

As a hop processing cooperative and recognised EU grower association, what contribution can we make to reducing emissions and hence to slowing down global warming? How can we prepare for these new conditions when it comes to growing hops?

We are fundamentally committed to doing business sustainably: after all, HVG members and employees and their families have been rooted in hop growing for generations. Hops should also offer good prospects for future generations. To us, hops represent a sense of home. We have been working on sustainable solutions since being founded in 1953. For example, we were able to develop a natural gas plant to generate energy from shredded hop vines. We have also successfully launched support programmes aimed at conserving energy and irrigating hops.

Our customers trust that our hop products are consistent with their own sustainability strategies. We see ourselves as having a dual responsibility: as a processor and service provider on the one hand, and as a grower association on the other. Our grower association is facing new challenges in terms of stricter regulations on pesticides, fertilisers, nitrates and irrigation, coupled with increased administrative requirements and bureaucracy.

We are investing in the next generation of hop farmers and improving how our hop farmers are trained. We have already played a significant role in shaping a nationwide sustainability system for hop cultivation in Germany. As a next step, we would like all our hop suppliers to be involved in this system. We are researching and breeding hop varieties that are particularly well adapted to extreme temperatures and water shortages in parallel with the successful breeding programme run by the Gesellschaft für Hopfenforschung (Society for Hop Research) in Hüll. We see good opportunities for safeguarding hop production in fertigation (irrigation with adapted fertilisation), while simultaneously reducing nitrate input into the soil. We aim to generate greater awareness of this approach among regional decision-makers.

In this, our first sustainability report, we set out what we have achieved so far from business, environmental and social points of view. We will also explain what we intend to do in order to preserve hop cultivation in Germany for a very long time to come - preferably for another 1,000 years - and to make it competitive.

Wolnzach, June 2021
Dr Johann Pichlmaier
Chairman of the Board of HVG e.G.

We are the growers!

In our role as a cooperative, we focus on increasing participation and exerting influence in the long run. Our legal form enables growers to take their economic and social interests into their own hands.

_____ Founded in October 1953 amid the adverse conditions following the end of the Second World War as the "Hopfenverwertungsgenossenschaft Hallertau e.G.m.b.H.", HVG is now the world's largest association of hop-growing farms. In 2001, growers from Tettnang (Baden-Württemberg) and Elbe-Saale (Saxony, Saxony-Anhalt, Thuringia) also became part of HVG. More than 1,000 active hop growers from all over Germany are currently united as members of the HVG Hopfenverwertungsgenossenschaft e.G.

A model for success

Founded on the ideas of Friedrich Wilhelm Raiffeisen and Herman Schulze-Delitzsch, who set out in the mid-19th century with the guiding principle that "that which is not possible for the individual can be achieved by joining forces", the cooperative has been a true model of success ever since. Unlike types of enterprises, a cooperative is defined by its focus on values, solidarity, re

The idea of cooperatives was included in UNESCO's representative list of the Intangible Cultural Heritage of Humanity in 2016.

This unique setup guarantees the international brewing industry a reliable supply of German hops of the highest quality and greatest variety. After all, the HVG continuously forwards the requirements of breweries all over the world to its member farms so that hop production can be adapted to suit the demands of the market. As a result, HVG's portfolio of varieties currently includes more than 30 different, tried-and-tested bitter and aromatic varieties as well as numerous new "special flavour" hops, which are in increasing demand among brewers who are seeking to create especially distinctive beers.

HVG only offers hops and hop products of German provenance and is therefore the first port of call when there is a demand for German-grown hops.

" What is impossible for the individual can be achieved by many. "
Friedrich Wilhelm Raiffeisen (1818–1888),
expert in agricultural policy and pioneer of cooperatives

Concentrated hop expertise: production technology, research, self-help and associations - the "House of Hops" at the heart of the market in Wolnzach is considered a centre of excellence for hops. The administrative headquarters of the HVG e. G. grower association has been located directly next door since 2003.

Hop expertise

The Centre of Excellence for Hops (Hopfen-Kompetenzzentrum), which was established in 2003 in Wolnzach (Hallertau/Bavaria), is the only one of its kind in the world.

_____ In an unprecedented demonstration of cooperation, HVG is working together with German Hopfenpflanzerverbände (hop grower associations), the Hopfenring, the Bayerische Landesanstalt für Landwirtschaft (Bavarian State Research Centre for Agriculture) and the Hopfenforschungszentrum Hüll (Hüll Hop Research Centre). Our joint activities range from breeding new varieties aimed at specific markets to advising growers on cultivation and pest management to public relations work with all the important stakeholders in the brewing industry, in both associations and the political sphere. It is a collaboration with a common goal: to strengthen and develop hop cultivation in Germany. The HVG plays a prominent role in this endeavour by initiating and supporting research projects, promoting important improvements in hop growing such as expanding the use of irrigation, or providing guidance on the information offered by the grower associations at national and international events.

HVG is a joint shareholder in the largest and most modern hop processing plant in the world.

Located in the municipality of Train (Kelheim district), in the heart of the Hallertau region, is the St. Johann hop refinery - the world's largest hop processing plant, in which the growers that use it hold a 40% stake through their HVG. The facility has a cold storage capacity for whole hops of up to 10,000 tonnes. The world's most advanced hop pelleting facility covers an area of 116,000 square metres. Up to 35,000 tonnes of hops can be processed here each year on four pelleting lines into normal and lupulin-enriched pellets (Type 45/Type 90) or extract. Refining the hops in this way results in a number of advantages over using whole hops in the brewing process: uniformity, stability and ease of dosage are significantly improved by processing hops like this. The lighter volume also makes it easier to transport and store the hops.

In the German Hop Museum in Wolnzach, an exhibition covering over 1,000 square metres reveals everything there is to know about hops: from biology to brewing, from cultivation to the hop trade, from the past to the present.

Leaf Hops Centre Mainburg

_____ HGV is also involved in another project in Wolnzach: the CO_2 extraction plant NATECO$_2$. Here, hops and other raw ingredients have been extracted in low-impact processes for more than 50 years. From the 2021 harvest onwards, the hop extraction process will move to St. Johann and only raw ingredients such as tea, cocoa and sabal will be extracted in Wolnzach.

More than 250 employees work in St. Johann, Wolnzach and Mainburg to process the hops.

Some of the storage and processing of leaf hops takes place at the HVG Leaf Hops Centre in Mainburg. Here, whole hops are packed into pressed bales each weighing between 50 and 100 kilograms, and vacupacks are also produced for brewers who use traditional hop powder or hop cones. Experienced logistics partners also deliver products from Mainburg and St. Johann to national and international customers. Alternatively, brewery customers can make use of HVG's cold storage service: previously purchased hop products can be stored appropriately at between roughly 0-5 degrees Celsius (32-41 degrees Fahrenheit) in refrigerated warehouses, the temperature and humidity of which are continuously monitored. The advantages of this for customers are obvious: it ensures that the quality of the hops remains high and the brewery can react flexibly to demand and market developments. Another benefit for brewers is that trial brews of different varieties are offered to customers in the pilot brewery at the factory premises in St. Johann.

More than 250 people are employed at the HVG facilities in St. Johann, Wolnzach and Mainburg. Unlike other trading houses, HVG only offers hops that are grown in Germany and processed into hop products. This unique selling point is underlined by the high market share, given that around 30% of the hops harvested in Germany are marketed globally by HVG.

NATECO$_2$ CO_2 extraction plant

" ... only those who have toiled in a hop yard really know just how much labour goes into a finished pint of beer... "

From a German folk song, dated around 1790

Photo: Claudia Köhler

History

When were we founded? What has our cooperative achieved so far? Here is a summary of the most important events.

6 October 1953
Founding of the Hopfenverwertungs-genossenschaft Hallertau e.G.m.b.H.

1954
Merger of existing cooperatives (Spalt, Hersbruck, Rottenburg-Herrenberg-Weil der Stadt and Rhenish Palatinate) to form Genossenschaftliche Hopfenverwertungs-Zentrale m.b.H (which existed until 1971)

1958
Opening of a state-of-the-art hop hall in Mainburg

1968
Stake in Hopstabil GmbH (producer of hop powder)

1974
HVG becomes a grower association as defined by the EEA Market Regulation

1982
Founding of HVG Hallertau Beteiligungsgesellschaft mit beschränkter Haftung, the purpose of which was to acquire hop processing companies, and acquisition of a stake in the hop refining company HVG Barth, Raiser & Co.

1999
Construction of the St. Johann Research Brewery, the first of its kind in the hop industry

2000–2001
Regional cooperatives from Hallertau, Elbe-Saale, Jura and Tettnang merge to form HVG Hopfenverwertungsgenossenschaft e.G.

2003
HVG moves into the new administration building in the 'Haus des Hopfens' in Wolnzach

2006
HVG acquires the rights to a new hop variety called "Herkules"

2008
New HVG hop irrigation support programme enables growers to secure supplies even in very dry years

2010
Launch of a support programme to reduce energy consumption in the hop drying process

2011
Increase in capital invested in the processing plants NATECO$_2$ GmbH & Co. KG and Hopfenveredlung GmbH & Co. KG, bringing its share up to 40%.

2012
Co-partner in the construction of a bio natural gas plant in which bio natural gas is produced from around 4,000 hectares of shredded hop vines.

2014
Gudrun Höfter becomes the first woman to be elected to the Board of Directors of the cooperative.

2018
Expansion of the St. Johann Research Brewery

2020
Completion of a new extraction plant in St. Johann

Our mission statement

What we stand for, what we believe in and what we want to achieve together...

Vision

We want to be your first choice for German hops!

Mission

As the largest grower association of German hop growers, we have been practising the cooperative principle "Together we are strong" since our foundation in 1953.

Our core mission is to market our growers' hops directly to the worldwide brewing industry. We refine hops into high-quality hop products and distribute these products through innovative services.

We are at the heart of a close-knit network of institutions and service providers in the hop-growing sector. We actively promote sustainability and the future viability of hop production in Germany through a wide range of research projects and trend-setting investments.

We are a reliable and fair partner to all of them and have outstanding expertise thanks to our unique proximity to German hop-growing and international breweries. We always ensure that our business practices are sound and sustainable, that our partnerships are based on cooperation and that the flow of information is transparent.

Slogan

Your German Hopportunity!

By forming their cooperative, our family farms have opened up a direct and modern distribution channel to breweries around the world.

Since 1953, we at HVG have been actively involved in shaping the transformation of the hop market and steadily driving it forward with sustainable business practices.

The growth in our sales shows that more and more customers prefer being able to deal directly with hop producers in a transparent manner.

Your German Hopportunity!

Our products

We offer a variety of hop products for a wide range of uses in the brewery. All these products share our commitment to traceability and quality.

Whole hops	Pellets	Extract
• HVG bale hops • HVG VacuPack	• HVG Type 90 pellets • HVG Type 45 pellets • HVG ISO pellets	• HVG CO_2 extract • HVG IKE Isomerized Kettle Extract

Storable hop cones

VacuPack

Pressed hop cones in VacuPacks have been used in breweries for many decades, primarily for adding doses of hops in the brewhouse, either in the brew kettle or in the whirlpool. However, this product is also ideally suited for a process called dry hopping, which happens in the beer cellar. VacuPacks are the ideal solution for breweries that prefer using hop cones to the wide variety of other available hop products. VacuPacks combine the advantages of hop cones (which are considered genuine or "natural") with protection against oxidation, as is the case with pellets, due to the low-temperature production process.

Why choose VacuPack?

- Significantly smaller packing volume than hop cones in a planter bale
- No discernible analytical differences between whole hops and VacuPacks
- Better storage stability due to inert packaging conditions
- The lupulin glands are squeezed during the pressing process, which improves ease of use and yield in the brewhouse
- Roughly 50% improvement in transfer of aromas during dry hopping compared to hop cones

In addition to the official certification procedure, every batch of hops is sampled in a neutral testing laboratory. Only once the origin, vintage and varietal purity have been confirmed can the hops be referred to as German seal hops.

Did you know that our products are produced in the largest hop processing plant in the world? HVG is a co-partner of Hopfenveredlung St. Johann GmbH, the most state-of-the-art hop processing plant in the world.

Pellets

Type 90 Pellets

Type 90 hop pellets are mainly used in the brewery for hop additions in the brewhouse, either in the kettle or in the whirlpool, but also for "dry hopping" in the beer cellar. By gently grinding the whole hops and then pressing them into pellets, all the valuable ingredients of the natural product hops are preserved. Filled under an inert gas atmosphere and protected by a special oxygen diffusion-proof film, our TYPE 90 pellets retain their full, naturally fresh aroma for several years when stored in cold conditions below 5 degrees Celsius.

Half the weight - double the effect: lupulin-enriched Type 45 pellets

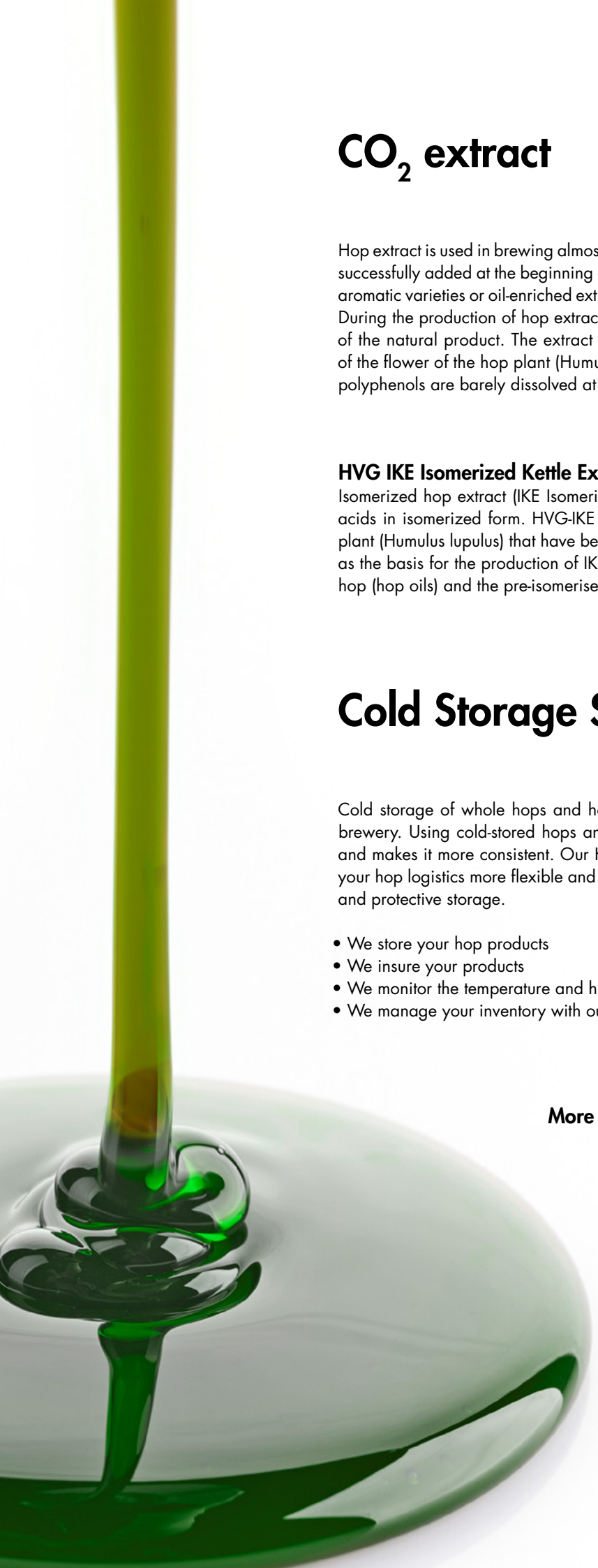
Type 45 hop pellets, like Type 90 pellets, are traditionally used in the brewery for hop additions in the brewhouse. For some time now, this product has been garnering special attention from brewers who want to achieve maximum aroma yield using minimal amounts of additions while reducing wort and beer losses in the whirlpool and on the cold side. We use Type 45 as the general product designation for enriched hop pellets, irrespective of the degree of enrichment. However, the degree of enrichment ranges from a highly enriched Type 30 pellet to a Type 85.

HVG Lupulinator™

This product has just one goal: to enhance aromas. It is not a new product in its own right, given that we have been producing highly enriched pellets since 1975. What is the difference between a LupulinatorrTM pellet and a conventional Type 45 pellet? The selection process of the whole hops, the degree of enrichment of hop ingredients and the strength of the pellets.

Why choose Lupulinator™ pellets?

All our experience in assessing batches of hops and in producing enriched pellets has been fed into this product line. Our team of experts selects the top grades of a variety of the vintage from countless batches to deliver exactly what creative brewers need: concentrated aroma that is typical of the variety. The guiding principle behind enrichment is quality over quantity. The pelleting process for Lupulinator™ pellets is particularly gentle in order to make them easier to use on the cold side.



CO_2 extract

Hop extract is used in brewing almost exclusively for hop additions in the brewhouse. It is widely and successfully added at the beginning of the boil to provide the requisite base bitterness. Extracts from aromatic varieties or oil-enriched extracts can also be added at the end of the boil in small quantities. During the production of hop extracts, as with pellets, care is taken not to alter the original quality of the natural product. The extract contains the essential natural bitter and aromatic substances of the flower of the hop plant (Humulus lupulus) in their natural, chemically unmodified form. Hop polyphenols are barely dissolved at all by the CO_2 extraction process.

HVG IKE Isomerized Kettle Extract
Isomerized hop extract (IKE Isomerized Kettle Extract), is a type of CO_2 extract containing alpha acids in isomerized form. HVG-IKE contains the non-polar substances from the flower of the hop plant (Humulus lupulus) that have been extracted using supercritical CO_2. HVG-CO_2 extract is used as the basis for the production of IKE. The extract is a mixture of the aromatic substances from the hop (hop oils) and the pre-isomerised resin fraction.

Cold Storage Service

Cold storage of whole hops and hop products is an important aspect of quality assurance in a brewery. Using cold-stored hops and products made from them improves the quality of the beer and makes it more consistent. Our HVG Cold Storage Service offers you the opportunity to make your hop logistics more flexible and take advantage of market opportunities by means of extended and protective storage.

- We store your hop products
- We insure your products
- We monitor the temperature and humidity of our cold stores
- We manage your inventory with our warehouse management system

More than 200 employees work at the St. Johann facility, processing a total of up to 35,000 tonnes of hops into pellets and extract.

We are the only company in the Hallertau region that is still able to produce traditional whole hop bales (ballots) at the Naturhopfenzentrum Mainburg.

Some of our whole hops are also packed in Mainburg in convenient 5-kilogram vacuum packs, our VacuPacks.


Einfahrt
Entrance
Въезд
Einfahrt
Entrance
Въезд


HVG Extrakt
40 * 150 G ALPHA/DOSE
Deutscher Hopfenextrakt
Hallertau
Northern Brewer
Palette Nr.:
Karton Nr.:
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" It's up to all of us to learn how
to preserve our planet.
There is no Planet B. "
Alexander Gerst, geophysicist and astronaut

Sustainability – our strategy

We believe in the idea that ecological, economic and social goals must be pursued equally in order to ensure greater justice in the world at large and for future generations too.

For us, sustainability means focusing on the future and taking a long-term approach while remaining successful in the interests of our members. As a cooperative, we have a long-term vision by definition. All our shareholders are involved in decision-making processes. By using financial resources in a targeted manner and working closely with local authorities, we are endeavouring to ensure that hops as a specialist crop will be able to survive in Germany in a working environment that is subject to numerous constraints.

The 2030 Agenda for Sustainable Development

In September 2015, the 2030 Agenda for Sustainable Development was unanimously adopted by the member states of the United Nations. The treaty for a fairer and more sustainable future contains 17 Sustainable Development Goals (SDGs) and 169 targets. The Sustainable Development Goals, or SDGs, act as a global system of targets and are aimed at everyone: governments all over the world, but also civil society, the private sector and academia. They range from eradicating global hunger to strengthening sustainable consumption and production to climate protection measures.

www.globalgoals.org

The 17 global goals for sustainable development of the 2030 Agenda, the Sustainable Development Goals (SDGs)

Goal 1: No poverty
End poverty in all its forms everywhere.

Goal 2: Zero hunger
End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

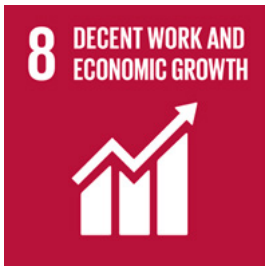
Goal 3: Good health and well-being
Ensure healthy lives and promote well-being for all at all ages.

Goal 4: Quality education
Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Goal 5: Gender equality
Achieve gender equality and empower all women and girls.

Goal 6: Clean water and sanitation
Ensure availability and sustainable management of water and sanitation for all.

Goal 7: Affordable and clean energy
Ensure access to affordable, reliable, sustainable and modern energy for all.



Goal 8: Decent work and economic growth
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Goal 9: Industry, innovation and infrastructure
Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Goal 10: Reduced inequalities
Reduce inequality within and among countries.

Goal 11: Sustainable cities and communities
Make cities and human settlements inclusive, safe, resilient and sustainable.

Goal 12: Responsible consumption and production
Ensure sustainable consumption and production patterns.

Goal 13: Climate action
Take urgent action to combat climate change and its impacts.

Goal 14: Life below water
Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Goal 15: Life on land
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Goal 16: Peace, justice and strong institutions
Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Goal 17: Partnerships for the goals
Strengthen the means of implementation and revitalize the global partnership for sustainable development.

THE GLOBAL GOALS

169 targets
The 17 Sustainable Development Goals (SDGs) and their 169 sub-goals address the greatest economic, social and ecological challenges of our time and initiate social transformation processes.

A fairer world without extreme poverty, free from famine, with contained environmental risks and climate conditions that do not pose global risks to human and animal life everywhere on earth - that is the vision.

The numbering and colours of the pictograms for the 169 sub-goals (targets) correspond to those of the 17 overarching Sustainable Development Goals.

When it comes to acting sustainably, every company must ask itself about its own potential to have an impact:

- What positive and negative influences does my company have on society?
- What is the main added value and harm of my company for the environment?
- What is the impact of the environment on my company?

In this context, it can be useful to take the Sustainable Development Goals (SDGs) formulated by the United Nations as a guideline, which, with their 169 sub-goals, offer a systematic approach and direction.

World's first biogas plant operated with shredded hop vines.

By 2025, we want all the hops we trade to be certified as sustainable.

Business

Our strategies are geared towards a very long-term time horizon. Since 1953, it has been enshrined in our Articles of Association (§2) that we should lay the foundations to ensure the economic viability of our member companies and of the HVG in order to guarantee their continued existence in the long term. After investing for many years in the expansion of our business operations, we were able to pay out more than €€27 million from generated profits to our members between 2002 and 2020.

Environment

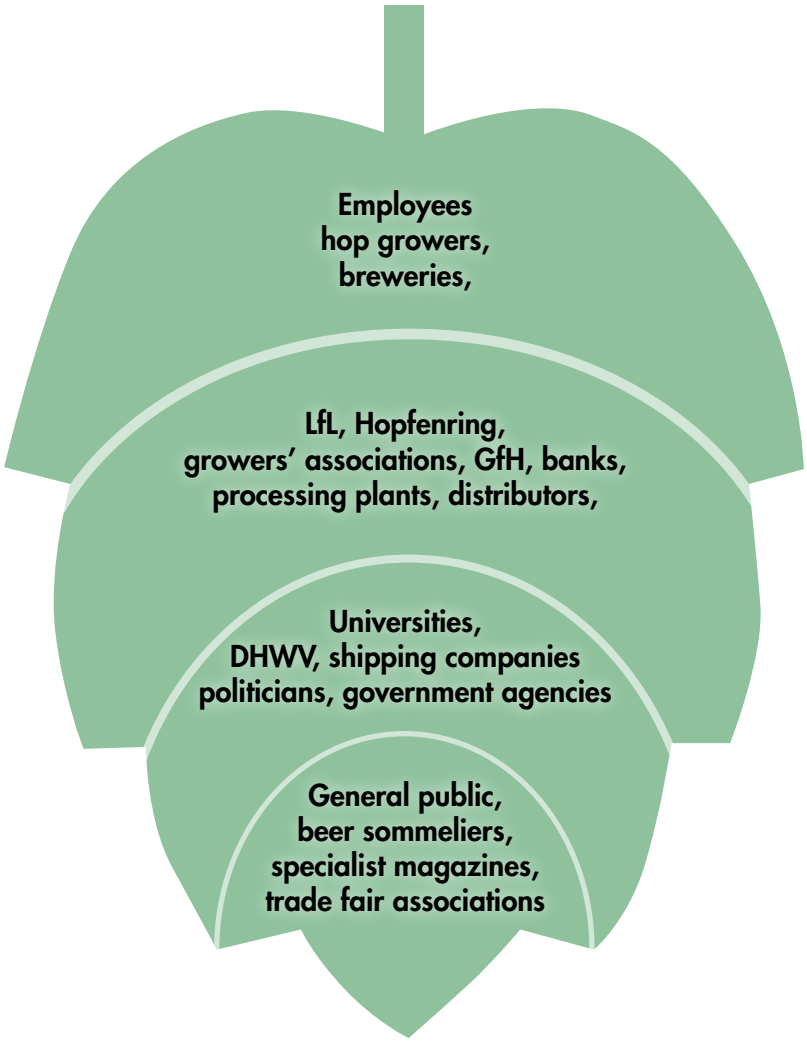
As a grower association, we have always had the ambition of expanding our environmental and nature conservation activities beyond what is required by law. One example of this is our investment in the construction of the world's first biogas plant that can run on shredded hop vines. Our aim is for all the hops that we trade to be certified as sustainable by 2025.

Social

Hops are a highly sought-after product around the world and have historically enabled us to maintain close contact with other countries and cultures. This global connectivity shapes our actions. It goes without saying that we interact with everyone in accordance with the principles of the UN Universal Declaration of Human Rights.

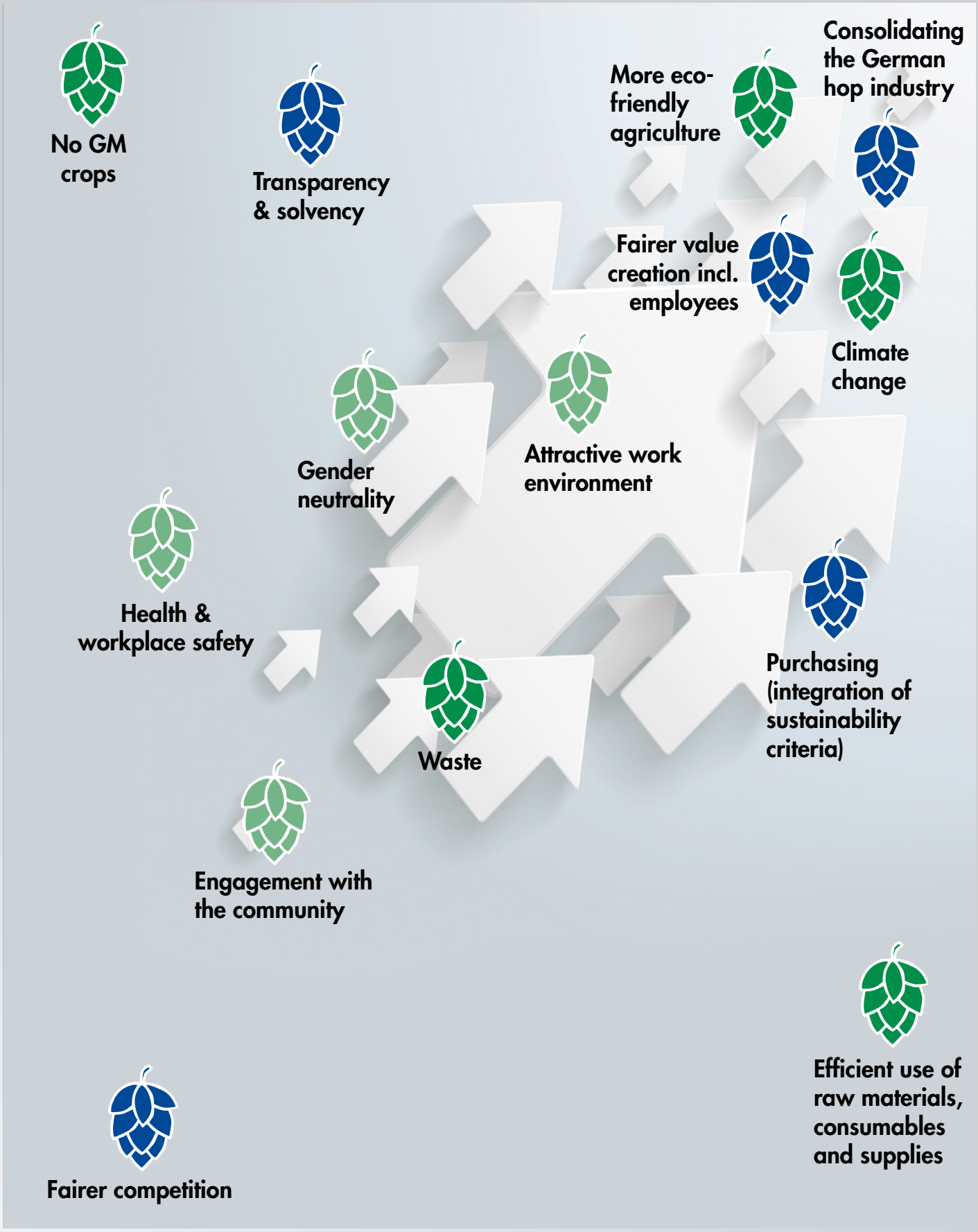
We want to support families involved in hop production to an even greater extent in the future and involve them in decision-making. With this in mind, we offer specific training for our members. We would be delighted if the next generation also decides to be involved in the HVG. Furthermore, we create incentives for the employees of hop farms in order to strengthen the farms and to promote independent marketing of hops within the cooperative.

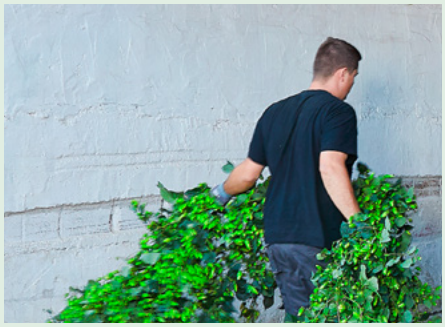
Stakeholders and relevant aspects of sustainability



LfL = Bayerische Landesanstalt für Landwirtschaft, GfH = Gesellschaft für Hopfenforschung e.V.,
DHWV = Deutscher Hopfenwirtschaftsverband e.V.

Who is directly or indirectly affected by or has an interest in our activities?
The term stakeholder refers to all the people, groups or institutions for whom it matters how we behave because of their interests. The result of a materiality analysis is a matrix that juxtaposes relevant sustainability issues from our perspective as well as from the perspective of our stakeholders (see figure on page 24). These spheres of activity form the basis for our ongoing strategic planning.


High relevance to stakeholders
Medium relevance to stakeholders
No GM crops
Transparency & solvency
More eco-friendly agriculture
Consolidating the German hop industry
Fairer value creation incl. employees
Climate change
Gender neutrality
Attractive work environment
Health & workplace safety
Purchasing (integration of sustainability criteria)
Waste
Engagement with the community
Efficient use of raw materials, consumables and supplies
Fairer competition
Medium relevance to HVG
High relevance to HVG
Environmental
Social
Economic



We intend to provide even more support to families involved in hop cultivation in the future.

We want to make hop growing fit for the future

Our primary role as a hop processing and international hop trading company is to market the goods produced by our members in a commercially successful manner. This is what it takes to preserve hop production and to be able to invest in trend-setting projects.
As an EU-recognised grower association, we are entrusted with responsibilities that safeguard hop production in Germany in the long term, such as multi-year projects in breeding, research and public relations. Only with the support of organisations and institutions at federal and state level can we, as a community of growers, manage these responsibilities. There is no doubt that the fact that we in Germany are world leaders in the field of hop cultivation is in part due to our excellent and long-standing cooperation with the Gesellschaft für Hopfenforschung (Society for Hop Research), which was founded in 1927, and the Bayerische Landesanstalt für Landwirtschaft (Bavarian State Research Centre for Agriculture).

Business	Environment	Social
Within the HVG:		
• Equitable value creation • Lean corporate structure • Strengthened equity base	• Transition to renewable energies • Opportunities for hop growers to use solar power • Heating with eco-friendly district heating in the Haus des Hopfens • Introduction of organic hops to product ranges	• Further education and training • Increased occupational safety and modernisation of the HVG Leaf Hops Centre in Mainburg • Preparing for demographic change
In the value chain:		
• Sustainable sourcing of hops • Funding of hop research • Support for young farmers following in their parents' footsteps • Empowering women hop growers • Developing proprietary hop varieties	• Recovery of energy from spent hops and harvest waste • Increase in irrigation and fertigation areas • Promotion of measures for even more environmentally friendly hop farming	• Raising the profile of agriculture • Close collaboration with the hop grower associations • Support for institutions, societies and associations • Involving the members of the cooperative in the organisation's success

The use of pesticides has been reduced by more than 60% since 1970 and the energy required to dry the hops has been cut by 30%. The number of working hours per hectare has decreased by one third.

The leap in productivity due to new varieties reduces the amount of land required.

Review of 1970-2020

Look at what we achieved!

	Change	1970	2020
Hop acreage, global (hectares)	– 11%	70,666 ha	62,850 ha
Hop acreage, former West Germany (hectares)	+ 53%	12,779 ha	20,706 ha
Hop acreage, former East Germany (hectares)	–	2,097 ha	
Proportion (%)	+ 57%	21.05%	32.95%
▶ **The acreage devoted to hops in Germany has increased significantly.**			
Total production of hops worldwide in tonnes	+ 20%	102,461 t	123,000 t
Total production of hops in former West Germany (+ former East) in tonnes	+ 58%	29,546 t	46,800 t
Proportion (%)	+ 32%	28.8%	38.0%
▶ **The market share of German hops rose to 38%.**			
Total production of alpha acids worldwide in tonnes	+ 110%	6,040 t	12,700 t
Total production of alpha acids in former West Germany (+ former East) in tonnes	+ 210%	1,741 t	5,400 t
Proportion (%)	+ 47%	28.8%	42.5%
▶ **Germany is a leader in alpha acid production.**			
Global population (billions)	+ 111%	3.70 billion	7.80 billion
▶ **The global population has doubled.**			
Beer production worldwide (rounded to millions of hectolitres)	+ 186%	630 m HL	1,800 m HL
▶ **Beer production has tripled.**			
approx. pre-contract price per kilo of whole hops Ø	nearly double*	DM 8.00	€ 8.00
*Equivalent purchasing power in 1970: 1.79 DM = €1, Source Deutsche Bundesbank			
▶ **HVG's direct business with breweries rose to almost 100% of turnover.**			

_____ We have substantially increased our share of global hop production since 1970. If we were still growing the same crops we had 50 years ago, we would need more than 46,000 hectares to produce the same amount of alpha acid. The newer breeds, such as Herkules, have more than double the kilogram yield per hectare and 4 times more alpha acid compared to the classic varieties. This leap in productivity has enabled us to increase alpha acid production by 210% with a roughly 40% increase in acreage. This protects the environment on the one hand and offers our customers a wider range of varieties, pricing brackets and flavours on the other. The development of hop products such as pellets and extracts reduce storage and transport volumes and preserve the quality of the crop for several years. We produce considerably more, with significantly better quality, in a more resource and environmentally friendly way and at lower cost in a reunified Germany - including in terms of hop production.

During this time, we transformed our business model as a hop growers' cooperative and focused on directly supplying the global brewing industry with innovative hop products. HVG currently sells around 30% of the German hop harvest directly to breweries. The rest is distributed via other hop traders. Growers have quintupled the volumes sold directly through the cooperative since 1970. HVG's direct business with breweries increased from 10% to almost 100% of turnover. Our growers are also striving to further expand the direct link between their cooperative and the breweries.

Climate change is posing new challenges for us.

As the population grows, so does global beer consumption.

Outlook for 2020-2060

What lies in store for us?

Let's take a cautious look at the next forty years: The global population is expected to grow to about 10 billion by 2060. It is assumed that demographic trends in Europe, and especially in Germany, will tend to run counter to global population growth over the next forty years.

There will be fewer of us in Germany, even if we take an optimistic view, and on top of that our proportion of over-60s will rise considerably - with far-reaching social consequences.

Projected demographic development	2020	2060
World population (billions)	7.8	10.2
Population of Germany (millions)	83.2	78.3
Population of Germany < 18 years (millions)	14.4	13.4
Population of Germany > 18 years and < 60 years (millions)	45.0	36.4
Population of Germany < 60 years (millions)	23.8	28.5
Proportion < 60 years (%)	28.6	36.4

- **The world population will grow by a third.**
- **In Germany, on the other hand, there are likely to be about 5% fewer people.**
- **Fewer young people in particular will be living in Germany: the number of under-18s will decrease.**
- **The proportion of Germans of working age between 18 and under 60 will also decrease.**
- **Germany will get older: the proportion of over-60s is predicted to rise by around a quarter.**

Information about the statistics: see www.hvg-germany.de, Sustainability

On our customer side, assuming the current average global per capita consumption of 23 litres per year, the total volume of beer being drunk could increase to 2.3 billion hectolitres by 2060. In Germany, on the other hand, the steady decline of the past 30 years is likely to continue due to ongoing demographic trends.
Today, the 40 largest brewing companies account for almost 90% of the global volume of beer. In contrast, the huge expansion of small craft breweries over the past 15 years has more than quintupled the total number of breweries worldwide to more than 20,000. Hops are a very important raw material for these smaller breweries, both in terms of quality and quantity, in the brewing process and in the marketing of their beers. This has resulted in a significant increase in hop consumption. The number of registered hop varieties has grown hand in hand with the increase in craft breweries from a few dozen in the past to more than 300 today.
It can be assumed that there will be further takeovers or consolidations in the craft beer sector and that these craft businesses will streamline their processes through improvements in management and production and will also make savings in their use of raw materials. Conversely, more and more of the large brewing groups are discovering the opportunities that hops offer for differentiating themselves from the competition. There will be fresh interest in how hops are used, far beyond their role purely as a source of bitterness for beer.
Stricter environmental regulations, increased energy costs, the threat of inflation due to global monetary policy and the measures required to achieve climate and sustainability goals all lead us to expect significantly higher production costs in the medium term.

Our business activities

Financial sustainability and equitable participation: the cooperative business model

We are a cooperative and we only buy, process and market hop varieties that are grown in Germany. A small proportion of these are whole hops, the majority are refined products such as pellets and extract. Since 2002, our cooperative has been able to pay interest on members' shares of up to 7%, depending on the market situation. We attach great importance to transparency, are supervised by the government and offer our members rights of co-determination that are not available in other forms of company. There are more than 2,000 agricultural cooperatives in Germany.

In 2016, the idea and practice of cooperatives were recognised by UNESCO as Intangible Cultural Heritage of Humanity. The coalition agreement of the Federal Government states that: "We want to strengthen cooperatives as a sustainable and crisis-resistant form of enterprise in a wide range of economic sectors."

Friedrich Wilhelm Heinrich Raiffeisen was a German social reformer and one of the founders of the cooperative movement in Germany

Approx. 85,000 people work in German agricultural cooperatives. More than 7,500 companies in Germany are organised in cooperatives in all. With more than 20 million members and about 800,000 employees, the Genossenschaftsverband (Association of Cooperatives) is the largest business organisation in Germany in terms of membership.

More than 48,000 tonnes of hops are harvested in Germany every year; around 80% of the harvest goes to more than 100 countries across all the continents. At the same time, the area of land used to grow hops is comparatively small – of the roughly 16.7 million hectares of agricultural land in Germany, only 0.15% is devoted to hops. In 2019, the German agricultural sector comprised some 266,600 farms, of which only 1,088 grow hops. The modest market share allows quality to be determined and recorded seamlessly, something that is unique for agricultural products.

Around 80% of German hops are exported. No other agricultural crop grown in Germany has a larger share of the world market than hops. Germany is the world champion when it comes to exporting hops!

As far as tracing the origins of hops is concerned, Germany set a new global standard in 1538 when the first hop seal was issued. With our modern certification system, brewers today can trace every batch of hops along the entire value chain – from the hop yard to the refined product. The "Neutral Quality Assessment" was also established back in 1993 on the initiative of the growers. This involves whole hops being tested by independent agricultural laboratories according to specific quality criteria. Minimum quality requirements are set and particularly good properties are rewarded by a bonus-malus system.

"I really appreciate how much care is taken with hops in Germany along the entire value chain."

Eric Toft, Brewmaster and Technical Manager at Schönram Brewery

more than **€ 300,000**

of the total costs for the neutral quality assessment is contributed by HVG as a grower association.

CERTIFICATE

DEKRA

ISO 9001:2015

DEKRA Certification GmbH hereby certifies that the organization

HVG Hopfenverwertungsgenossenschaft e.G.

Scope of certification:
Trade in hops and hop-products

Certified locations:
Kellerstraße 1, 85283 Wolnzach, Deutschland
Freisinger Straße 48, 84048 Mainburg, Deutschland

has established and maintains a quality management system according to the above mentioned standard. The conformity was adduced with audit report no. A18101091.

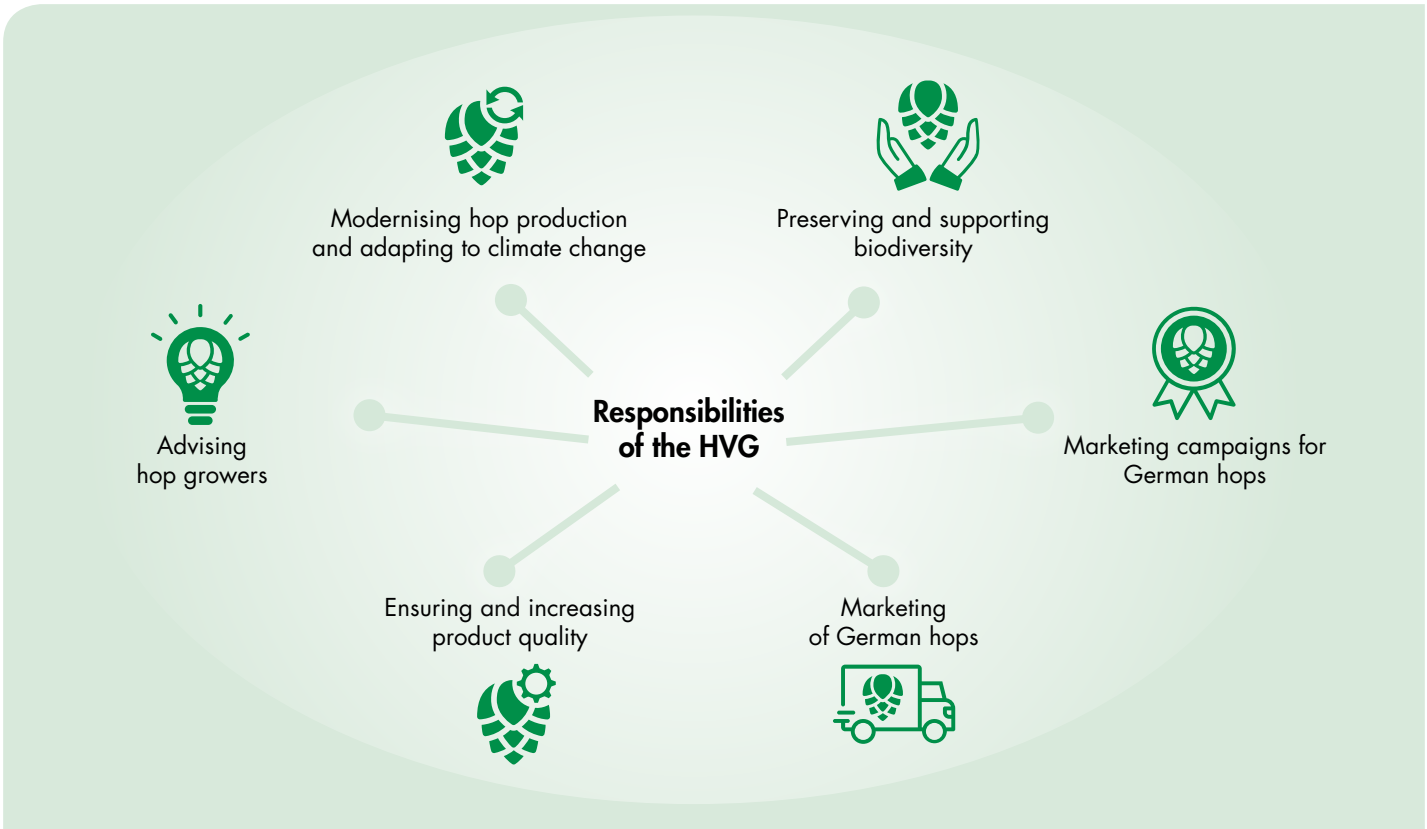
Certificate registration no.: 91118698
Validity of previous certificate:
Certificate valid from: 2018-11-14
Certificate valid to: 2021-11-13

Dr. Gerhard Nagel
DEKRA Certification GmbH, Stuttgart, 2018-11-14

DEKRA Certification GmbH * Handwerkstraße 15 * D-70565 Stuttgart * www.dekra-certification.de

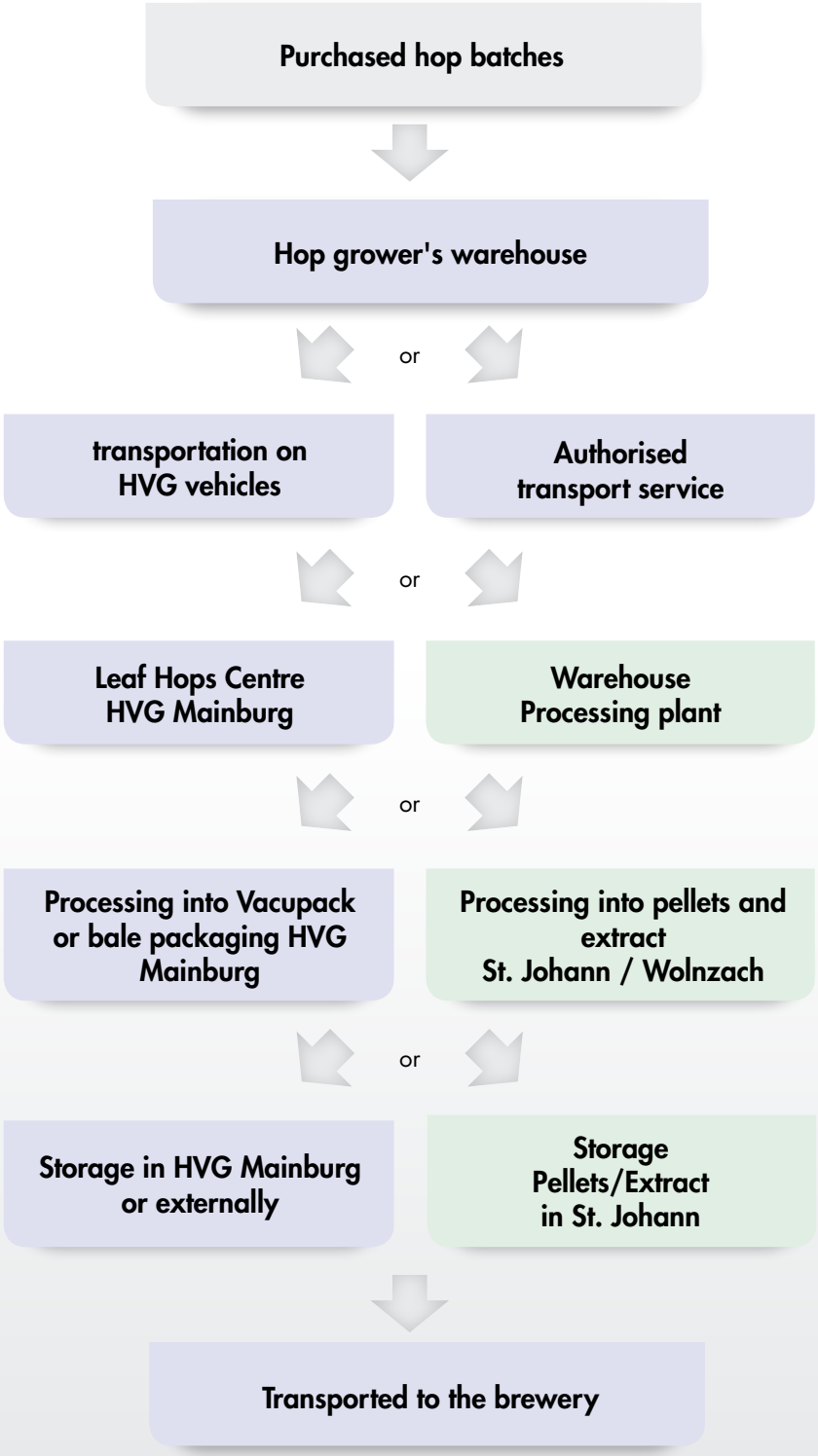
page 1 of 1

Our cooperative is certified. ISO 9001:2015 is the internationally recognised standard for establishing, implementing and maintaining a quality management system.



Our supply chain

Actors and processes



QMS and HAACP of HVG e.G.

QMS and HACCP of the processing plants

European and national legislation

After each harvest, samples are taken from more than 10,000 hop consignments and analysed in independent laboratories.

We make an important contribution to ensuring that our brewery customers enjoy not only the best quality hops but also a reliable supply of any German variety. To this end, we are in continuous dialogue with our members about the latest requirements in the brewing industry and organise advice sessions and training courses for growers. As the organisers of the "German Hop Day", we bring hop producers and breweries together and thereby allow both sides to become aware of each other's concerns.

We support a wide range of projects focussing on hop production, pest management and breeding research in partnership with universities such as the Weihenstephan Science Centre for Nutrition, Land Use and the Environment (WZW), the Hopfenring, the Verband Deutscher Hopfenpflanzer (Association of German Hop Growers) and the Bayerische Landesanstalt für Landwirtschaft (Bavarian State Research Centre for Agriculture) with its Hop Research Institute in Hüll (Wolnzach).

In 2006, we acquired the variety rights to the then new and promising Herkules variety from the Gesellschaft für Hopfenforschung (Society for Hop Research) for €€500,000. This was done in order to limit cultivation to the community of growers in Germany and thereby secure its productivity advantages. Today, Herkules is the most widely planted hop variety in the world, with over 6,700 hectares.

Since 2017, we have been running our own breeding programme in close collaboration with Jakob Schauer, a passionate hop breeder, so that future-proof hop varieties can be cultivated for our growing regions in the face of climate change. Jakob Schauer owns varieties that he has crossed and bred himself, which we as a cooperative believe to be exceptional and which should be available to all growers in Germany once they have been successfully approved.

HVG became the first market participant to introduce what is known as a hop pool in 1998. The hop pool is a very effective instrument for stabilising the market for free hops (hops not covered by contracts) when their price threatens to collapse. This also enables the HVG to guarantee growers prices that are in line with the market. The procedure is as follows: The cooperative communicates a down payment price at which it will purchase hops. Once the marketing campaign is over, the final back payment on the pool hops is calculated from the revenue generated.

100%
Processing in a radius of no more than **25 kilometres**

85%
Hops originate from a radius of no more than **35 kilometres**

15%
Hops originate from a radius of no more than **375 kilometres**

Local processing and sourcing of ingredients

Jakob Schauer, hop grower and breeder in Grafendorf (Hallertau)

HVG's own breeding project:
new, more resistant varieties are needed in the face of climate change. HVG runs its own breeding programme in close collaboration with Jakob Schauer.

Hallertau PGI growing region (Bavaria)

880 member farms across **an area measuring** 17,233 hectares, with an average of **19.6 hectares** per farm

Elbe-Saale PGI growing region (Saxony, Saxony-Anhalt, Thuringia)

29 member farms across **an area measuring** 1,564 hectares, with an average of **53.9 hectares** per farm

Tettnang PGI growing region (Baden-Württemberg)

125 member farms across **an area measuring** 1,479 hectares, with an average of **11.8 hectares** per farm

The EU quality label Protected Geographical Indication (PGI) is awarded by the European Union's EU Commission Directorate-General for Agriculture and Rural Development. The criteria for awarding the label are developed jointly by independent bodies, and the awarding process is transparent. Comprehensive and regular inspections give the label credibility.

The goals of our business activities

Consolidating the German hop industry

• Funding of hop research

We will continue to support research projects conducted by the Landesanstalt für Landwirtschaft (LfL). This support comes in the form of participation in committees and subsidies for individual projects, for which we provide around €€300,000 per year.

The aim is to gain new insights for growers that will, among other things, improve irrigation management in hop production, provide forecasting models for disease and pest control and identify development potential for high-performing new varieties in specific hop-growing regions.

Sub-goal 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the TEN-YEAR FRAMEWORK OF PROGRAMMES ON SUSTAINABLE CONSUMPTION AND PRODUCTION, with developed countries taking the lead

Sub-goal 15.5. Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

Sub-goal 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

• Introduction of new HVG hop varieties by 2025

In addition to the existing publicly funded hop research, from which around 80% of the hop varieties produced in Germany originate and which has been supported by HVG for years, HVG is pursuing the objective of breeding its own varieties. Hop varieties that are adapted to cope with changing climatic conditions on the one hand and meet the specific requirements of breweries, for example in the USA, on the other. By harnessing Jakob Schauer's breeding expertise as part of a collaboration that began in 2017, we hope to have introduced at least one new variety by 2025. The HVG is providing up to €€200,000 per year for trial cultivation, expert supervision and brew trials with professional tasting.

Sub-goal 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

Sub-goal 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

- **Advanced training for female hop growers and future generations of farm owners**

In the context of our own sustainability strategy, we are intensifying our focus on the interests of female hop growers and future generations. The cooperative aims to support the development of hop farms and contribute to their success by offering a range of customised and specialised events covering all aspects of hop cultivation and farm life. Joint training courses and events are intended to boost the sustainability of our hop cultivation and to strengthen the member farms and their families in terms of the three pillars of business, the environment and social welfare.

Sub-goal 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

Sub-goal 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development

Sub-goal 5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life

Sustainable procurement of hops

- **100% of HVG hop suppliers certified according to Hopfenring standards/Sustainability Self-Assessment**

A modern sustainability system was developed and established for German hop-growing in 2014 under the leadership of the Hopfenring, and it now acts as a benchmark. Today, 50% of the hop volumes delivered to HVG can be designated as sustainable through this system. It is our intention to continue this development by aiming to have all member farms integrate their hop production into this sustainability system. Our goal is for 100% of our hops to be certified as sustainable by the 2025 harvest.

We intend to compensate the growers for the additional expense and provide an appropriate budget for this (approx. €€200,000). Our aim is to position our hop production in the long term with respect to social, environmental and economic concerns in such a way that future generations will be able and willing to continue producing hops.

Sub-goal 9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

Sub-goal 12.1 Implement the TEN-YEAR FRAMEWORK OF PROGRAMMES ON SUSTAINABLE CONSUMPTION AND PRODUCTION, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

THE GLOBAL GOALS

For more information, please visit:
www.globalgoals.org

Our environmental activities

A desire to protect the environment and respect for nature have influenced our activities for generations, both on the hop farms and in the processing plants.

In the Federal Republic of Germany, environmental protection and nature conservation are enshrined in the Basic Law and subject to government regulations. Government authorities and private stakeholders in the hops sector work closely together to implement the regulations in a targeted manner. The small number of stakeholders in the hop industry and the high degree of concentration allow for seamless monitoring of the value chain.

Achieving carbon neutrality means striking a balance between greenhouse gas emissions and the sequestration of carbon from the atmosphere into carbon sinks. In order to achieve net zero emissions, all greenhouse gas emissions worldwide must be offset by carbon sequestration.

The European Union has set out becoming carbon neutral as a policy objective. By 2020, greenhouse gas emissions in Germany had been reduced by 40.8% (730 million tonnes) compared to 1990. The goal is to increase that figure to 55% by 2030, and the European Union wants its economic area to be carbon neutral by 2050. In September 2020, the German government adopted the Climate Protection Programme 2030 with binding sector-specific targets and an annually increasing CO_2 price for greenhouse gas emissions. This is expected to increase energy costs in our processing plants by 13% from 2020 to 2021 alone. For hop growers in Germany, the CO_2 price will make a litre of heating oil 7.9 cents gross more expensive in 2021, rising to 17.3 cents by 2025. According to the German Ministry of the Environment, in 2018 agriculture accounted for 63.6 million tonnes of CO_2 equivalents, or 7.4 per cent of total greenhouse gas (GHG) emissions for the year across Germany.

Fields of activity	**1990** in m tonnes CO_2equivalents	**2014** in m tonnes CO_2equivalents	**2030** in m tonnes CO_2equivalents	**2030** Reduction in % compared with 1990
Total amount	**1,248**	**902**	**543–562**	**56–55**
Energy sector	466	358	175–183	62–61
Buildings	209	119	70–72	67–66
Transport	163	160	95–98	42–40
Industry	283	181	140–143	51–49
Agriculture	88	72	58–61	34–31
Sub-total	**1,209**	**890**	**538–557**	**56–54**
Other	39	12	5	87

Emissions of the fields of activity included in the target definitions (Source: German Federal Environment Ministry, 2016, German Climate Action Plan 2050)

With an average annual production of 42,000 tonnes of hops in the Hallertau region, the demand for heating oil is 18.5 million litres. By optimising the drying processes appropriately, it was possible to reduce the consumption of heating oil over the past few years from 44 litres to 35 litres of heating oil per decitonne of dried hops. This equates to a saving of 10,000 tonnes of CO_2 per year.

(Source: Bayerische Landesanstalt für Landwirtschaft (LfL))

In hop production, the carbon footprint from stringing in spring to energy-intensive drying during harvesting averages about 3.8 kilograms of CO_2 equivalents per kilogram of whole hops. With an average harvest of 47,000 tonnes, hops therefore account for 0.28% of total agricultural greenhouse gas emissions in Germany.

The HVG has financed numerous research projects over the course of a number of years and fed the results of those projects into a support programme aimed at implementing practical energy-saving measures for German hop growers. By improving drying processes accordingly, the consumption of heating oil over the past few years was reduced from 44 litres to 35 litres per decitonne of dried hops. More than 10,000 tonnes of CO_2 are saved every year in the Hallertau growing region as a result of this. If we add up the entire value chain up to the brewing kettle, including processing and transport, approximately 4.43 kilograms of CO_2 are produced per kilogram of hops.

Example: Carbon balance sheet for hop cultivation

Stage	Kilogram CO_2e/hectare
Greening	19
Fertilisation (after nutrient removal)	1,326
Crop protection	126
Stringline	688
Framework repair	39
Water	6
Diesel production and combustion	1,462
Energy consumption for harvesting, drying and irrigation	2,340
Packaging	39
Greenhouse gas emissions per hectare	**6,045**
GHG emissions from the production of the farming inputs used	2,350
GHG emissions in the fields	3,695
Greenhouse gas emissions per kg hops in kg CO_2e/kg hops	**3.86**

Calculation of greenhouse gas emissions per kilogram of hops using the example of the Northern Brewer variety (Source: Bayerische Landesanstalt für Landwirtschaft (Bavarian State Research Centre for Agriculture)

When used in conjunction with renewable energy sources, electric mobility offers an additional opportunity to reduce our carbon footprint. Transport was responsible for approximately 19% of greenhouse gas emissions in Germany in 2019. In order to discover the advantages and disadvantages of electric mobility in practice, we are currently conducting field tests on the first fully electric vehicle, a VW ID3 Pro.

Initial data indicate a power consumption of 22 kilowatt hours per 100 kilometres. Relative to a comparable diesel vehicle with 5.5 litres per 100 kilometres, this corresponds to CO_2 emissions of 2,400 kilograms of CO_2 (80g/km.) for 30,000 kilometres of driving with the current electricity mix vs. 4,200 kilograms of CO_2 for the diesel (140g/km.). The break-even point for CO_2 emissions, taking into account the battery and car production, would therefore be at a mileage of 70,000 kilometres.

In order to limit global warming to 1.5 degrees Celsius, humankind must produce energy and operate in a carbon-neutral manner by 2050 at the latest (Intergovernmental Panel on Climate Change, IPCC, Special Report 2018).

Photovoltaic sources could provide about 12.5 trillion kilowatt hours (kWh) annually around the world by then. Our member farms are part of the action!

Electricity from renewable energy sources

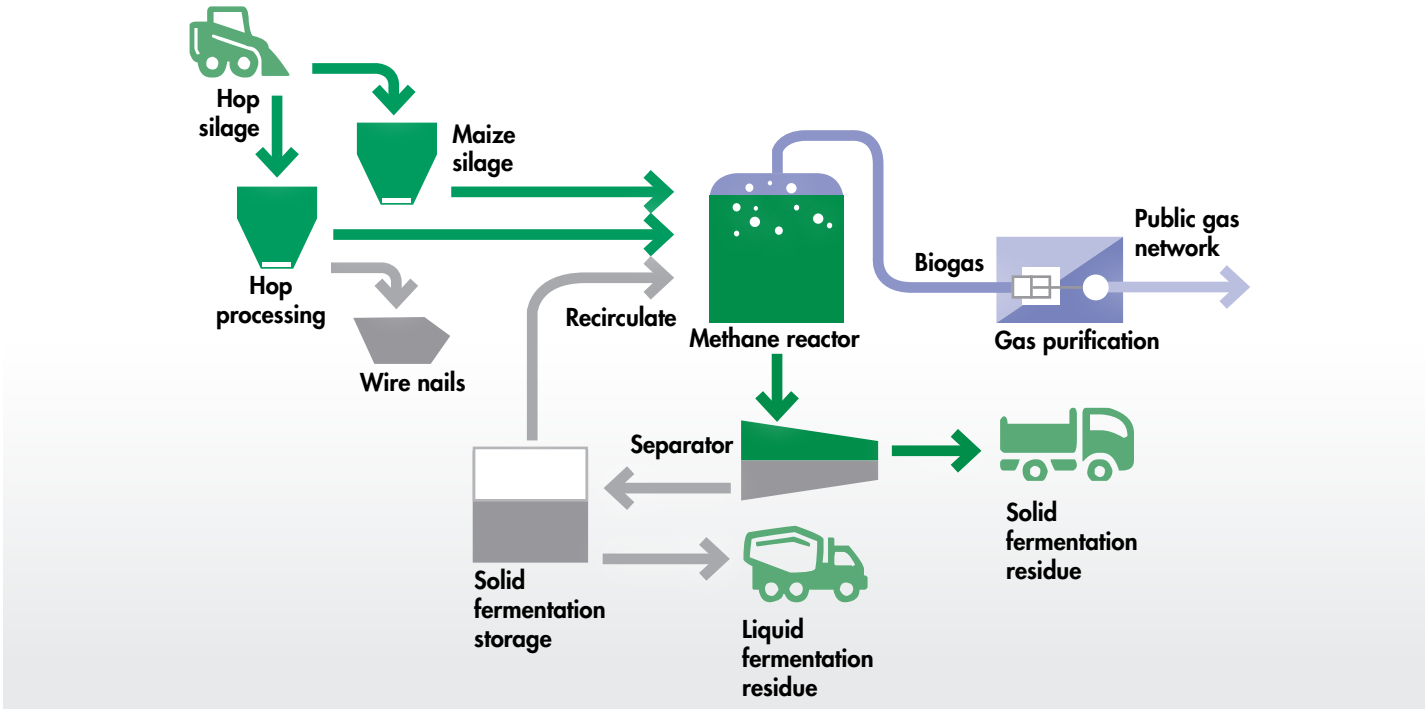
The energy transition introduced by the German government in 2011 poses new challenges for agriculture and industry. The proportion of renewable energy sources in total electricity consumption in Germany had already reached 46% (252 terawatt hours) by 2020.

The most recent amendment to the Renewable Energy Sources Act envisages increasing this share to 65% (approx. 380 terawatt hours) by 2030. Many of our members and hop growers operate photovoltaic systems and are therefore contributing to the energy revolution. In total, they generate an estimated 40-50 gigawatt hours.

In Oberlauterbach in Bavaria, hop waste is used to produce biogas.

Waste

About 14 tonnes of plant waste per hectare are produced during the hop harvest. In 2012, we began operating the world's first facility for producing biogas from hop waste in partnership with the energy company E.ON. We buy shredded hop vines from growers from around 4,000 hectares of cultivated land and deliver them to Bioerdgas Hallertau GmbH. The result is enough gas for around 5,000 households from almost 25% of the overall acreage devoted to hops. Furthermore, the residues from the fermentation process are returned to the fields in the form of fertiliser. The methane yield of one tonne of fresh weight of the chopped hop vines is approximately 44 standard cubic metres (CH4).



The harvested hop cones must be packaged in a way that protects the quality of the product, simplifies the logistics of transporting them and protects the environment. To achieve this, the hops are compressed in special polypropylene rectangular bales. The material is new, approved for food use and contains no additions of reclaimed or recycled material to ensure that it can be fully recycled. The entire harvest therefore produces around 400 tonnes of PP material, 100% of which is recycled. We drove the switch to this new rectangular packaging through a support programme in 1999.

The environmental management of our processing plants is certified according to ISO 14001:2015. Up to 35,000 tonnes of hops are turned into pellets and about a third of that amount also has extract drawn out of it. When hop extraction began back in 1962, organic solvents such as methylene chloride and hexane were commonly used. By 1985, the process had been completely converted to involve the use of supercritical CO_2. Today, all the CO_2 in the processing plants comes from natural fermentation. The CO_2 is recirculated and used again and again in the extraction process.

In the period under review, the production of hop pellets and extract produced about 10,900 tonnes of spent hops, which is certified as animal feed due to its high protein content of between 15% and 20%. Although it is only a small contribution to the almost 24 million tonnes of mixed feed produced in Germany, we are nevertheless pleased that hops not only make their way into the glass in the form of beer, but also find their way onto the plate via this indirect route.

Along the Abens River at St. Johann

Water

Compared with many other countries in the world, Germany is blessed with plenty of water. It is precisely because the average annual rainfall is 700-800 mm that we have been able to grow hops here on a large scale for generations. According to the Bauernverband (Farmer's Association), agriculture consumes a mere two per cent of the 28.5 billion cubic metres of water used in Germany, or just 0.3% out of the available volume of 188 billion cubic metres. The trend towards rising average temperatures and the increased number of hot days (above 30 degrees Celsius) prompted us back in 2008 to set up a six million Euro funding programme to install drip irrigation systems on hop farms. As a grower association, this has been our most substantial support measure since the HVG was founded. As a result, over the past twelve years, the amount of irrigated land for hops in Germany has increased to about 20%. When combined with fertilisation (fertigation), irrigation allows for more efficient use of nitrogen and reduces groundwater pollution.

In Germany, key questions of water management are dealt with by the Federal Ministry for the Environment (BMU).
The BMU is currently advocating for even stronger protection of groundwater against nitrate and pesticide inputs.

In the Hallertau region, it rained an average of about 790 millimetres per year over the last ten years. This corresponds to a natural water volume per hectare of 7,900 cubic metres. By comparison, an Olympic pool measuring 50 by 25 by 2 metres holds 2,500 cubic metres of water.

However, the distribution of rainfall varies greatly depending on the weather pattern in the months from June to September, which are very important for hops, and any dry spells lasting several weeks can put the plants under stress and have a disproportionately negative impact on yield and quality (alpha acid content).
According to calculations carried out by the Landesanstalt für Landwirtschaft (LfL), a hop plant has access to somewhere between 2,300 and 2,800 litres of water. Of this, about 600 litres are available from water-saturated soil in spring and about 1,700 litres from precipitation between June and harvest. Where possible, up to 500 litres can be added through irrigation. Irrigation and fertigation systems are designed to inject up to 1,000 cubic metres of water per hectare into the soil during the four important summer months.

Water use in our HVG offices and the Mainburg facility was 550 cubic metres for the reporting period. By way of comparison, a family of 4 uses about 180 cubic metres of water a year.

In contrast to malting facilities, pelleting plants require comparatively little process water and consumption is therefore around 7,000 cubic metres per year, with 35,000 tonnes of hops processed at 0.4 cubic metres per tonne of hops. Once the extraction plant has moved from Wolnzach to St. Johann, this figure will rise to an estimated 20,000 cubic metres.

This means that processing and management together amount to about 0.7 cubic metres of water per tonne of hops processed. With a hop dosage in the brewhouse of 300 grams per hectolitre, this amounts to roughly 0.2 litres of water input per 100 litres of wort.

Fertilisation and crop protection

Like other permanent crops such as vines, hops are also susceptible to diseases and pests, although this depends on weather conditions and resistance. To ensure yield and quality, growers must therefore resort to using crop protection products. The agents used to control diseases and pests such as downy mildew and powdery mildew, hop aphids or mites are rigorously tested for efficacy, environmental performance and safety for the crop. Special spraying devices (spray blowers) have been developed for applying the crop protection products, which ensure the agents are applied in a targeted and even manner. Only targeted and proper fertilisation can also guarantee good yields while maintaining soil health and low levels of nitrate contamination in the groundwater.

Fertilisation

The LfL and the Hopfenring have a great deal of expertise with regard to proper fertilisation and the necessary inputs of nitrogen (N), phosphate (P_2O_5), potassium oxide (K_2O), magnesium oxide (MgO), lime (CaO) and micronutrients. The Düngeverordnung (Fertiliser Ordinance) in Germany imposes very clear and very strict requirements on farms in this respect, combined with corresponding obligations to provide documentation.

Since nitrogen fertilisation in particular is of significant relevance to the environment, extensive Nmin analyses are carried out every year by the Hopfenring when the crop begins to grow. In 2020, a total of 3,782 analyses were carried out on 811 farms. Maximum permissible fertiliser quantities during the growing season are calculated on the basis of the determined nitrogen levels in the soil and the known total requirement of the hops. All data must be documented on a field-specific basis.

Downy mildew warning service

A forecast model for the most important hop disease, downy mildew (Pseudoperonospora humuli), was developed at the Hops Research Centre in Hüll as far back as the early 1980s in order to determine whether control measures would be necessary and when they should be carried out. As a result, it was possible to reduce the 15 sprays that were previously applied to an average of 6 to 7 applications per year. The HVG grower association is involved in this system and covers the costs of the calls to the growers and the expenses for the daily assessments.

Alongside the official certification procedure, every batch of hops is sampled in a neutral testing laboratory as part of the neutral quality assessment.

The inspection is carried out in accordance with the specifications of the NQF (Neutral Quality Assessment) working group.

The pesticide residue monitoring system

For the 2011 harvest, the hop industry introduced a pesticide residue test as a further step towards assuring the quality of German hops. In order to obtain a representative cross-section across all varieties and harvest dates, a sample of every one in 20 plants from the German hop harvest is used in anonymised form for a residue analysis. Each sample is tested for more than 500 potential chemical residues. The HVG grower association contributes €100,000 a year to the costs of this monitoring.

The HVG's financial contributions to hop research and breeding projects amount to up to € 500,000 per year.

Our "Grüne Heft" (Green Booklet), which is published each year before the start of the season, covers all aspects of cultivation, harvesting and after-treatment. How crop protection products are coordinated is a cross-border issue and here too we, as an organisation of hop growers, play a disproportionately large role in terms of financial and human resources. In recent years, a large number of consumer countries have issued their own import tolerances for maximum pesticide levels, some of which deviate from our European standards. The US and German hop industries (Verband Deutscher Hopfenpflanzer and Deutscher Hopfenwirtschaftsverband) have commissioned the firm Bryant Christie to investigate the import standards (residue tolerances) for hops worldwide and to minimise any trade barriers as part of negotiations with government departments. The growers contribute a total of approximately 70% of the financial contribution from Germany, amounting to US$150,000.

Organic farming

Growing hops in compliance with organic farming standards presents a farm with considerable challenges. On the one hand, the very specific diseases that affect hops are difficult to control with the resources available in organic cultivation, and on top of that, the yields from organic production are usually significantly lower. On the other hand, hops are tall growing crops that are very susceptible to drift from neighbouring areas. On the consumer side, it is proving to be quite challenging to match supply with brewery demand. Some of our members are nevertheless passionate and committed organic farmers and were pioneers in this field in Europe.

The total area of hops farmed according to organic farming criteria in Germany has increased from 81.1 hectares in 2011 (8 farms) to just under 181.2 hectares (11 farms). This equates to 0.9% of the total amount of hops grown. The members of the IHGC (International Hop Growers' Convention) claim that the amount of land under organic management in Europe is 257 hectares (0.8% of the total acreage). The USA produces 328 hectares following organic standards, which equates to 1.3% of its total acreage. By way of comparison, in 2019, 10,532 farms in Bavaria were farming according to organic standards on almost 366 thousand hectares (11.8% of Bavaria's agricultural land). This was 30.8% of the total number of organic farmers in Germany (34,110) on 22.9% of all organically farmed land (1.61 million hectares).

HVG markets almost 20 tonnes of hops produced according to organic standards through special agreements between growers and breweries. Our natural hop centre in Mainburg and the pelleting plant in St. Johann are both certified to process organic products.

The Institute for Plant Production and Plant Breeding of the Bayerische Landesanstalt für Landwirtschaft (Bavarian State Research Centre for Agriculture) and the Verband Deutscher Hopfenpflanzer e.V. (Association of German Hop Growers) have drawn up guidelines for integrated crop protection in hop cultivation.

The general guidelines apply to all aspects of crop protection in hop cultivation. The pest-specific guidelines contain detailed instructions on how to deal with pests, diseases, viruses and viroids in hops.

Legal framework

The National Action Plan for the Sustainable Use of pest management Products was adopted by the German government on 10 April 2013 and aims to reduce the risks that can arise from the use of crop protection products. On 7 February 2020, the "Guidelines for Integrated pest management in Hop Cultivation" were incorporated following publication in the Federal Gazette. These guidelines are based on the eight general principles of integrated pest management from Annex III of the Plant Health Framework Directive 2009/128/EC and give substance to these principles for hops. This demonstrates that the hop industry's crop protection strategy consistently makes its contribution to nature conservation in line with political requirements and is put into practice by our farms on a daily basis.

A pesticide residue test is carried out as part of the Neutral Quality Finding (NQF) for quality assurance purposes.
In order to obtain a representative cross-section across all varieties and harvest dates, one in every 20 samples from the Neutral Quality Finding is used in anonymised form for such an analysis. The inspection process is stipulated in the contract

The Bavarian state government's BioRegio 2030 programme has set itself the goal of increasing the agricultural area of organically produced products from the current level of just under 12% to 30% by 2030. If we take the current trend for hops, then according to the LfL an increase from the current level of just under 1% to 3% of hop acreage would perhaps be realistic if demand on the part of the buyers were to evolve accordingly (see Brauwelt No. 33-34 (2020) pp. 854).
In May 2020, the EU Commission announced its Farm-to-Fork strategy as part of the Green Deal. Among other objectives, agriculture should fulfil the following requirements by 2030:

€• Halve the use of harmful pesticides
€• Reduce the use of fertilisers by 20%
€• Ensure that organic farming accounts for at least 25% of the land in Europe

These are very ambitious targets, which will not be easy to achieve in the case of hops in light of the substantial reductions that have already been achieved. HVG supports the activities of the Verband deutscher Hopfenpflanzer (Association of German Hop Growers) and COGECA (European umbrella organisation of agricultural cooperatives) to lobby the European Union about the unique features of hop growing and for a more nuanced approach to the hop sector.

HVG has been supporting various hop-growing projects aiming to make hop cultivation more environmentally friendly for many years. These activities can broadly be attributed to the following areas:

Production techniques

- Improving the nutrient efficiency of hops through fertiliser systems with fertigation
- Trials of composting and using shredded hop vines to optimise the nutrient efficiency of organically bound nitrogen, among other things
- Irrigation and fertigation projects

Crop protection

- What degree of infestation by the hop aphid Phorodon humuli can be tolerated on hops at the time of cone formation?
- Monitoring for hop stunt viroid (HSVd) and citrus bark cracking viroid (CBCVd) infections in hops in Germany
- Defining the interaction between hops and hop powdery mildew at the cellular level and functional analysis of genes involved in the defence system
- Review of two forecast models for combating powdery mildew in hops and introduction of a forecast for combating the disease in practice
- Biological soil decontamination

Hop breeding

- Development of a test system for testing aphid resistance on hop seedlings
- Breeding hops with floral, citrus and fruity aromas
- Cross-breeding for the landrace Tettnanger
- Development of vigorous, healthy high-alpha varieties with particular suitability for cultivation in the Elbe-Saale region
- Breeding new hop varieties with greater resilience to drought and heat waves in the context of climate change

Ecology in hop cultivation

- Use of entomopathogenic nematodes (EPN) for biological control of the lovage weevil Otiorhynchus ligustici in hops
- Testing of a streptomycete strain for controlling Verticillium hop wilt
- Behaviour of bees in the hop yard and studies on guttation in hops
- Minimising the use of copper-based crop protection products in organic and integrated hop production
- Development of a catalogue of measures to promote biodiversity in hop growing

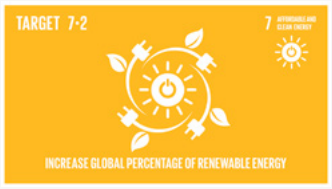
The budget for supporting hop research has been around € 300,000 per year to date and is set to be increased in the coming years.

The goals of our environmental activities

Climate protection and energy efficiency

- **Conversion to solar power generated by hop growers at HVG headquarters and at the HVG Leaf Hops Centre in Mainburg**

Not only do we want to source the electricity we use from renewable sources, we also aim for this electricity to be produced directly by our growers. The Haus des Hopfens is already heated with eco-friendly district heating from renewable energy sources. Now we want to source the approximately 170 megawatt hours for our two facilities in Wolnzach and Mainburg from locally generated "hop electricity". We estimate that our members generate a total of about 40-50 gigawatt hours of electricity from their photovoltaic systems. By 2022, we plan to be working with local suppliers to develop a model of regional electricity procurement that can be scaled up and will also enable other companies to purchase locally generated "hop electricity". Since many facilities will no longer receive EEG subsidies in the next few years, this would be a long-term project to ensure the continued operation of our members' facilities.



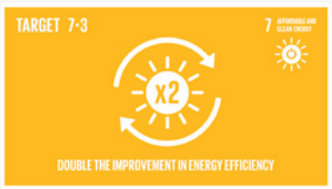
Sub-goal 7.2 By 2030, increase substantially t he share of renewable energy in the global energy mix

Sub-goal 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

Sub-goal 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

- **Transition to ammonia as a refrigerant in the processing plants**

During this reporting period, it is planned to convert the refrigeration systems of cold stores 3 and 4 to use ammonia as a refrigerant with a capital investment of €900,000 and in collaboration with our co-partners. When the conversion is complete, there will no longer be two refrigeration systems in operation, but one refrigeration system that supplies both refrigerated warehouses. The new system removes the need to use the ozone-depleting refrigerants R404A and R410A and instead runs on 200 kilograms of ammonia. This modern system will have the added advantages of being more efficient and consuming less electricity.



Sub-goal 7.3 By 2030, double the global rate of improvement in energy efficiency

Sub-goal 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the TEN-YEAR FRAMEWORK OF PROGRAMMES ON SUSTAINABLE CONSUMPTION AND PRODUCTION, with developed countries taking the lead

Sub-goal 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

More environmentally friendly agriculture

- **Increase the proportion of irrigation and fertigation areas to 50% by 2030**

As a result of a multi-year programme, more than 20% of hop-growing areas in Germany have been provided with drip irrigation systems since 2008 through financial incentives and intensive consultation. Other hop-growing nations, such as the USA, grow almost 100% of their hops by means of irrigation and fertigation. There are regional differences in Germany. However, the difficulties in getting additional wells approved prevent the necessary expansion of irrigated areas. Preliminary work has shown that the water layers that we would use in the Hallertau region drain into the Danube from a geological point of view, which would not cause any depletion of the groundwater reservoirs. Targeted nutrient supply in hop cultivation through fertigation also significantly reduces nitrate pollution, for example. Irrigation guarantees stable yields and thereby guarantees supplies to the worldwide brewing industry, which is heavily dependent on volatile German hop production. In addition, fertigation increases soil health, improves permeability because the soils do not dry out, and reduces land use because of the increased yield. There is still a need for political persuasion to highlight the benefits of irrigation and fertigation.

Sub-goal 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

Sub-goal 6.5 By 2030, implement integrated water resources management at all levels, including through transnational cooperation as appropriate

Sub-goal 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

For more information, please visit:
www.globalgoals.org

THE GLOBAL GOALS

Our social activities

A cooperative differs from other companies in more ways than its legal form. The members of a cooperative are a long-term community with a shared set of interests and a common destiny.

We strongly believe that only through united action can we achieve those goals that each of us alone would not be able to accomplish. Entrepreneurial success is not an end in itself, however, but rather the necessary platform for shaping the future and thereby constantly improving the lives of all those who work in the cooperative. Day in, day out, HVG member companies and employees give their best to grow the finest hops with care, process them carefully and deliver them reliably to breweries all over the world. We gladly get up every morning to carry out this worthwhile task.

In Germany, income disparities are countered primarily by means of social benefits, social insurance and taxes. We aim to offer our employees more than the minimum benefits stipulated by law in relation to pension plans and supplementary health insurance, for example.

Social legislation

It would go beyond the scope of this document to list all the EU, federal and state laws and regulations to which we, as a cooperative and recognised EU producer community, are subject and in accordance with which we are regularly audited. Many of the aspects relating to sustainability are already covered in detail in this document.

In Germany, companies are subject to a large number of laws, especially in the field of employment law. Special attention is therefore given to social aspects. The field of individual employment law regulates aspects such as equal treatment, annual leave, parental leave and protection against dismissal. Employment protection law deals with the protection of minors, working hours and maternity rights, while collective labour law deals with issues such as the Works Constitution Act. There are also comprehensive social laws and procedural laws in place.

There are a number of statutory social benefits for employees in the Federal Republic of Germany that cannot be taken for granted in other countries. Employers contribute 7.3% of gross wages to health insurance, slightly more than 1.5% of gross wages to long-term care insurance, 9.3% of gross wages to pension insurance and 1.2% of gross wages to unemployment insurance. Wage replacement benefits are regulated by law and protect employees in the event of illness, dependency on care, workplace accident, disability or unemployment. Social benefits also include pension contributions, child benefits, parental allowance, maternity allowance and insolvency allowance.

The tax and social security burden on employees in Germany is relatively high - the highest of all OECD countries in 2019. Of the almost €€800 billion in federal, state and municipal tax revenue, almost €€220 billion is accounted for by wage tax alone. When employers' contributions are added, Germany is just behind Belgium in second place worldwide. A minimum wage was introduced in Germany in 2015. In the reporting period, it was between 9.19 and €€ 9.35 for each hour worked.

The importance of pensions is increasing in light of the ongoing shift in demographics. In 2020, there will be 57 pensioners for every 100 contributors, whereas in 2030 there will probably be 67 and in 2050 even as many as 77. The retirement age will therefore be gradually increased to 67. From 2040, pensions will also be subject to full taxation.

Our head office is located in Wolnzach (Bavaria).

Growing demand for skilled workers is one of the challenges that companies in every industrialised nation will face in the near future.

Bavaria is also affected by this against the background of demographic change and globalisation.

Markt Wolnzach

The municipality of approximately 11,000 inhabitants is located inside the triangle formed by Munich, Ingolstadt and Regensburg. The unemployment rate in the greater Munich area is less than 3%. The Chamber of Industry and Commerce's Skilled Workers Report for 2019 predicts that: "Between 2018 and 2030, the shortage of skilled workers will increase from 260,000 to 450,000 people across Bavaria. Almost 10% of all positions will remain vacant in 2030."

Anyone wanting to move to the Hallertau region will find a very tense real estate market. One indicator of the region's attractiveness is the trend in property prices between 2011 and 2019. The average purchase price for a 60-square-metre flat has almost doubled in this period from € 2,320 per square metre to € 4,570 per square metre (reference: Pfaffenhofen a.d. Ilm). A clear shortage of skilled workers is emerging in the medium term. Attracting people from other regions is made more difficult by a limited and expensive real estate market.

Work environment

Here at HVG, we want to be the very first choice for the best professionals. We are committed to providing a distinctive working environment with exciting challenges for our colleagues. Our products are made-to-measure, the logistics are complex, and we have to supply 800 customers in more than 100 countries. Hops are one of Germany's "hidden champions". Our work combines a regional focus with an international outlook in a unique way.

Our turnover in the reporting period was€ 93 million. We have an above-average turnover productivity of about€ 2 million per employee (by way of comparison, the average nationwide is€ 299,000 per employee, and in the retail sector€ 325,000 per employee). This productivity can only be achieved when an efficient structure with streamlined processes is combined with an agile and motivated workforce.

Our colleagues, many of whom come from current or former farming backgrounds themselves, bring to HVG a passion for hops, a love of nature and a pragmatic and solution-driven work ethic.

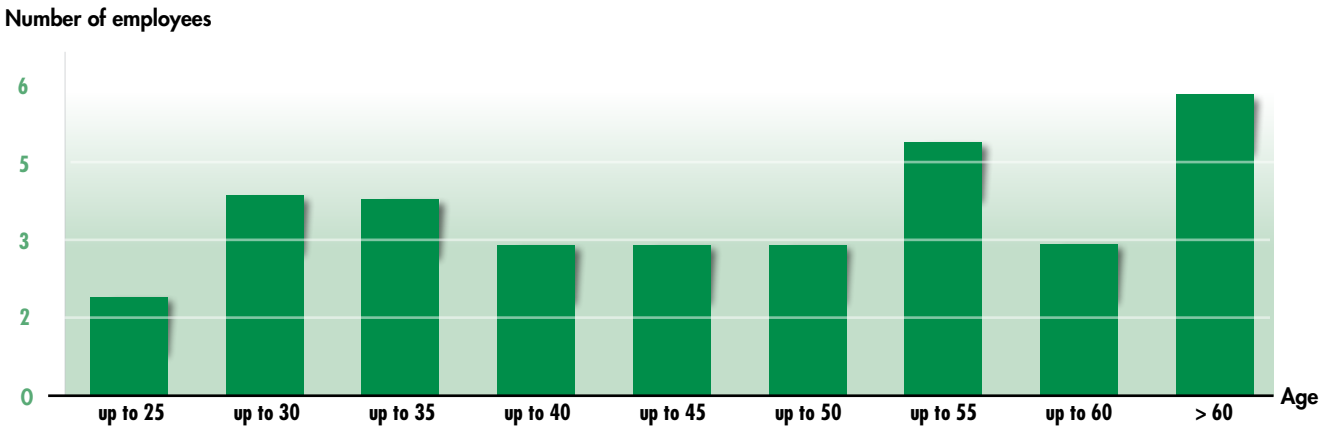
Hops and the art of brewing have shaped our homeland for centuries. Within a few minutes' drive from our headquarters are two of the world's oldest breweries that are still operational: the Weihenstephan brewery in Freising (dating from 1040) and the Weltenburg monastery brewery near Kelheim (founded in 1050).

Hop growers' traditions and festivals and the craft of brewing are intangible treasures that must be preserved for future generations.

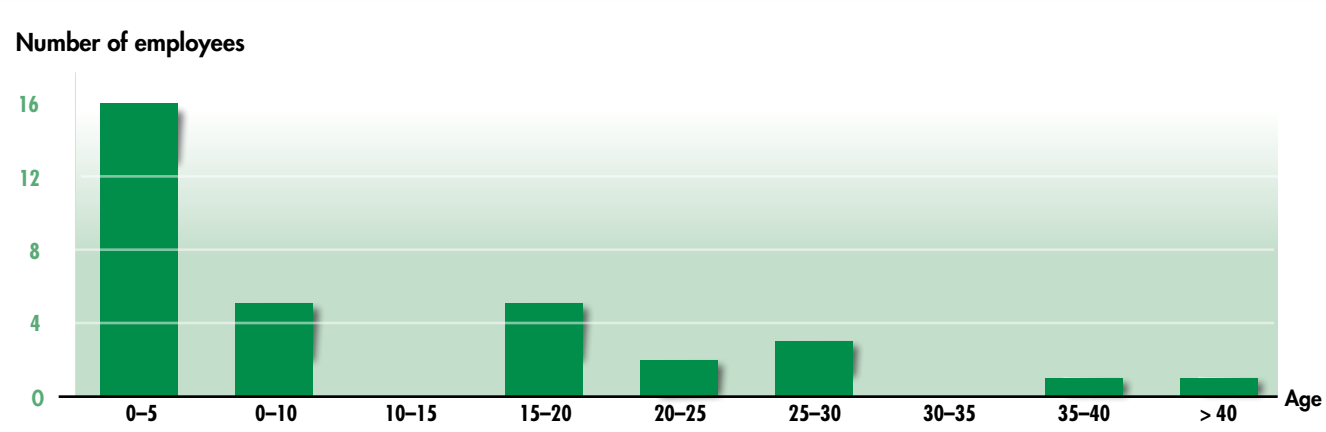
A car is provided for the "hop queen" who is traditionally elected by the growers for the "regency", and we contribute to the costs of this. We also sponsor the beer tasting festival called "Große Biere, kleine Gläser" (meaning "Big Beers, Small Glasses") that was launched a few years ago by the village community of Attenkirchen.

Operating structure

There are 33 members of staff (13 women and 20 men) in the core HVG team. The average age is 45 years and is roughly evenly distributed between 23 years for our youngest colleague and 63 years for our most experienced colleague.



Age structure at HVG



Years of employment

We have hired many new members of staff over the last 5 years. About half of the core team has been with us for less than 5 years, but a third of the team has been with us for more than 15 years.

The average total amount of time that employees stay with HVG is 12 years. This puts us very close to the national average in terms of average age and length of service.

During the season and immediately after the hop harvest, we get additional reinforcement from seasonal workers at the HVG Leaf Hops Centre in Mainburg from September to spring. This number varies somewhat depending on the month of the year. There are about 20 staff (13 women and 7 men) in addition to our core team. Of our 26 female colleagues (49% of all HVG employees), 12 work part-time.

Philomena Orzek being honoured in 2015 for 50 years at HVG.

Employee well-being

Our doors are always open, and we interact with our employees in a direct and unbureaucratic manner. Our everyday actions are characterised by flat hierarchies, trust in the abilities of individuals and personal responsibility.

Working atmosphere:

We create all the conditions to make the working environment at HVG as pleasant and safe as possible. When there is room for improvement, we act accordingly. Issues such as the working environment for individuals and infrastructure are also separately addressed and documented in the annual staff appraisal and in additional selective staff surveys. We are constantly asking ourselves how we can guarantee the ideal working environment.

Where the working environment allows, dogs are also allowed to come along from time to time.

1. We attach great importance to treating each other with respect, both within HVG and externally with our stakeholders, and condemn any form of discrimination and marginalisation.

2. Our HVG Standards for Responsible Business Conduct, which relate to a) labour rights, health and safety, b) governance, c) human rights and d) the environment, set out the values by which we are guided.

3. The workstations meet modern ergonomic standards. We consistently and comprehensively take into consideration the aspects of workplace safety, health protection and hazardous areas. This is monitored by an outside company and verified by the Employer's Liability Insurance Association.

4. We ensure that we have modern software and hardware for information technology and have removed most printers from the offices or fitted remaining ones with filters because of the problem of fine dust.

5. The employees at the Leaf Hops Centre in Mainburg are provided with work clothes that meet the latest standards.

The families of our employees are very dear to us. We support young families by offering additional benefits.

Workplace social benefits:
We aim to offer our employees more than just the minimum benefits stipulated by law. We use the scope available to us to increase motivation and identification with HVG, and to inspire people about our mission and bind them to us in the long term.

1. Even when a position with us is only temporary, we do not use temporary employment agencies, but use **our own HVG contracts with equal conditions for all employees**. Although this is the more laborious approach, for us it is the right one in the spirit of the cooperative.

2. The workplace benefits that we offer include:
   - A **supplementary private health insurance policy**. For a separate premium, family members can also be insured under the conditions of the special contract.
   - **A direct insurance policy**, which is intended to act as an additional source of income upon retirement.
   - **Insurance against accidents, disability and death** as a safeguard in the event of accidents during working hours.
   - **A performance bonus**, which is dependent on the annual result.

3. A substantial part of the cooperative's financial profit is paid out to the hop growers in the form of a) a capital dividend and b) a merchandise refund or sales dividend. More than €€27 million have been paid out to the hop farms since 2002.

4. **Parental leave**: The families of our employees are dear to our hearts and we support young parents by giving employees as much flexibility as possible in arranging their working hours and completing their assignments, in addition to the benefits required by law, such as maternity leave, financial support and job guarantees. One colleague was on parental leave during the reporting period.

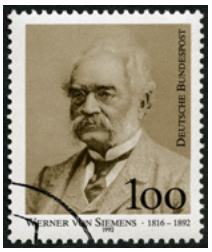
VacuPack plant in the Mainburg Leaf Hops Centre

Workplace safety and health management:

Our workplaces are regularly inspected in accordance with government and trade association regulations. During the reporting period, the VacuPack plant at the Leaf Hops Centre in Mainburg was completely refurbished with an investment of €€500,000 to bring handling safety up to the latest standards.

During the reporting period, planning is also underway to fit the laboratory of the Mainburg Leaf Hops Centre with modern ventilation systems. This will make working with solvents for the purpose of hop analysis safer in time for the 2021 harvest.

"Preventing accidents must not be perceived as a legal requirement, but as an imperative of human obligation and economic rationality."
Werner von Siemens



Basic and advanced training:

The rapidly increasing demands and challenges facing the market require our employees to undergo regular advanced training. We make sure this happens by offering a wide range of internal and external training opportunities. The management identifies the training needs in HVG based on needs reports and training assessments. All employees are required to discuss their training needs with their supervisor at least once a year. This approach improves identification with the company and makes work easier, because better and more up-to-date expertise helps us to carry out our daily tasks safely, without mistakes, in a relaxed manner and to a high level of quality.

More than 50 internal and external training and advanced training courses were held or attended in each of the last two years. More than 80% of all HVG employees have taken part in at least one programme.

Training opportunities with HVG:

- General, individual and external training courses as well as thematic training courses
- Training on the production cycle for pellets and extracts
- Changes in tax and customs requirements
- Emergency first aiders, hygiene training and workplace safety briefings

The participating employees can evaluate the quality and relevance of these training programmes in accordance with our quality management system.

Engagement in and for the community:

Our employees are engaged in a wide range of social activities. We are particularly pleased to have four colleagues among us who are actively involved in the local fire brigades and in doing so make a significant social contribution to their communities in their private lives. The fire brigade is one of the largest groups in Germany that is committed to helping its fellow citizens. There are approximately 23,700 fire brigades in Germany (volunteer, professional and company fire brigades combined) with about 1.1 million active fire fighters and about 450,000 retired, honorary and youth fire fighters.

One of our colleagues is based in Berlin and, through her involvement in SpeiseGut, a solidarity-based farming project on the outskirts of Berlin, underlines her affinity with agriculture, not only professionally but also in her private life. In this system, several private households cover the costs of a farm, in return for which they receive its crop yield. The personal relationship between the producers and the consumers allows them to experience the many advantages of non-industrial farming that is not dependent on the market.

Strengthening the public image of agriculture is key to gaining acceptance for measures among the general public and politicians. The association Unsere Bayerischen Bauern e.V. (Our Bavarian Farmers) aims to create awareness of the considerable diversity and quality of regional produce and to emphasise the importance of agriculture for the Bavarian economy and cultural landscape. HVG provides around €€70,000 of funding every year for this project, which was launched in 2016.

On the association's platform, consumers can find information on almost every agricultural sector: in addition to detailed farm profiles and portraits of the wide range of products, they can also find insights into professions, practical tips from everyday agricultural life, consumer-oriented advice for responsible purchasing and much more.

Membership of associations and interest groups

Genossenschaftsverband
Bayerischer Bauernverband
International Hop Growers' Convention
Gesellschaft für Hopfenforschung e.V.
Deutscher Hopfenwirtschaftsverband e.V.
Hopfenring e.V.
Versuchs- und Lehranstalt für Brauerei in Berlin (VLB) e.V.
Doemens e.V.
Maschinenring Ilmtal e.V.
Forum Bier e.V.
Deutsches Hopfenmuseum e.V.
Gesellschaft für Geschichte des Brauwesens e.V.
Gesellschaft für Öffentlichkeitsarbeit bayerisches Bier e.V.
Cerveceros de España
Deutscher Braumeisterbund
Industrie und Handelskammer für München und Oberbayern
Private Brauereien e.V.
Markus Wasmeier Bauernhof- und Wintersportmuseum
Wissenschaftliche Station für Brauerei in München e.V.

Donations:

Every year at Christmas, we alternate between donating to local associations and charities in one of the hop-growing regions. During the reporting period, a total of €€2,000 was donated in Tettnang, divided into € 1,000 for the Urmel Kinder Krebshilfe and €€500 each for food banks and Hospiz-Verein.

The goals of our social activities

Appealing working environment

- **Create awareness among employees about the challenges of demography and elicit active engagement with the issue of old-age provision**

The pension system in Germany is falling increasingly out of balance. For pensions alone, the subsidy from taxes to the pension system in 2020 already amounts to over € 100 billion. The pension level (ratio of average income to average pension) has fallen from 55% in 1990 to 48% today, and various studies predict that it will fall to 43% by 2030. The government has created various incentive systems for private old-age provision. Increased efforts are also being made to strengthen third pillar schemes through models linked to the employer. At HVG, we already support our employees through our direct insurance scheme.
By the end of 2022, we want to offer advisory services for our employees with external service providers so that they can get a complete picture in terms of their specific private situation and so that we have a solid basis for decision-making within the company as to what we can contribute to improving pension provision.

Sub-goal 10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality

Sub-goal 1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable.

Equitable value creation

- **Profit-sharing for growers: HVG has various ways of enabling its members to participate in the success of the business.**

One means is to pay interest on shares in the form of a capital dividend. Another means is the patronage refund model, in which a bonus can be paid out on previously set contract prices depending on the success of the business. Since 2002, our growers' families have received more than €€27 million through these channels.
In the future, we aim to pay a dividend of at least 2% above the market rate on our members' business shares. To complement this, we continue to strive to reward part of our business success in the form of a patronage refund for the hops delivered to the cooperative.

Sub-goal 2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

Sub-goal 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.

For more information, please visit:
www.globalgoals.org


" We cannot avoid the fact
that every single thing
we do has an
impact on the whole. "
Albert Einstein, German physicist (1879-1955)

Facts and figures

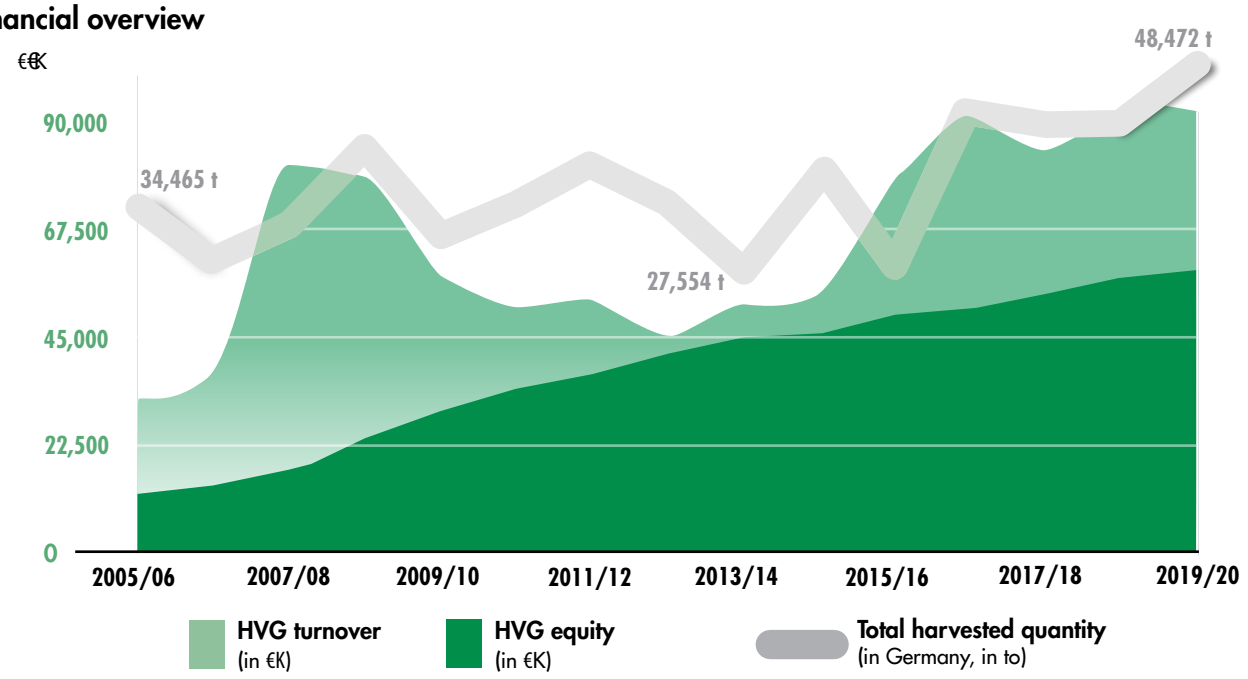
Key figures document facts and highlight developments. This enables us to identify our opportunities and risks.

The following are financial and non-financial key indicators that are important for measuring the sustainability performance of our cooperative. The reference period comprises the financial years 2019 and 2020 respectively. As a rule, the figures are rounded, which may lead to minor deviations in the totals.

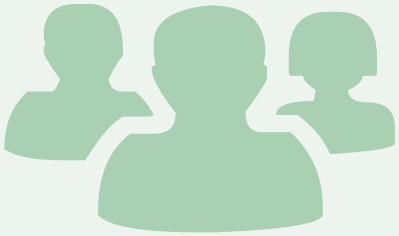
Acreage share of hop varieties in Germany

Variety	Total acreage (ha)	Variety	Total acreage (ha)
Herkules	6,717	Hallertauer Opal	144
Perle	3,297	Nugget	123
Hallertauer Tradition	2,870	Spalter	113
Hallertauer Magnum	1,918	Hüll Melon	107
Hersbrucker	904	Ariana	83
Tettnanger	718	Hallertauer Smaragd	82
Hallertauer	671	Cascade	78
Spalter Select	608	Other cultures	76
Hallertauer Saphir	449	Callista	61
Polaris	340	Akoya	30
Mandarina Bavaria	278	Monroe	23
Northern Brewer	266	Brewers Gold	19
Hallertauer Taurus	210	Hallertauer Merkur	8
Amarillo	178	Comet	8
Hall. Blanc	167	Relax	4
Saazer	157		
		Total	**20,707 ha**

Financial overview



Supervisory Board

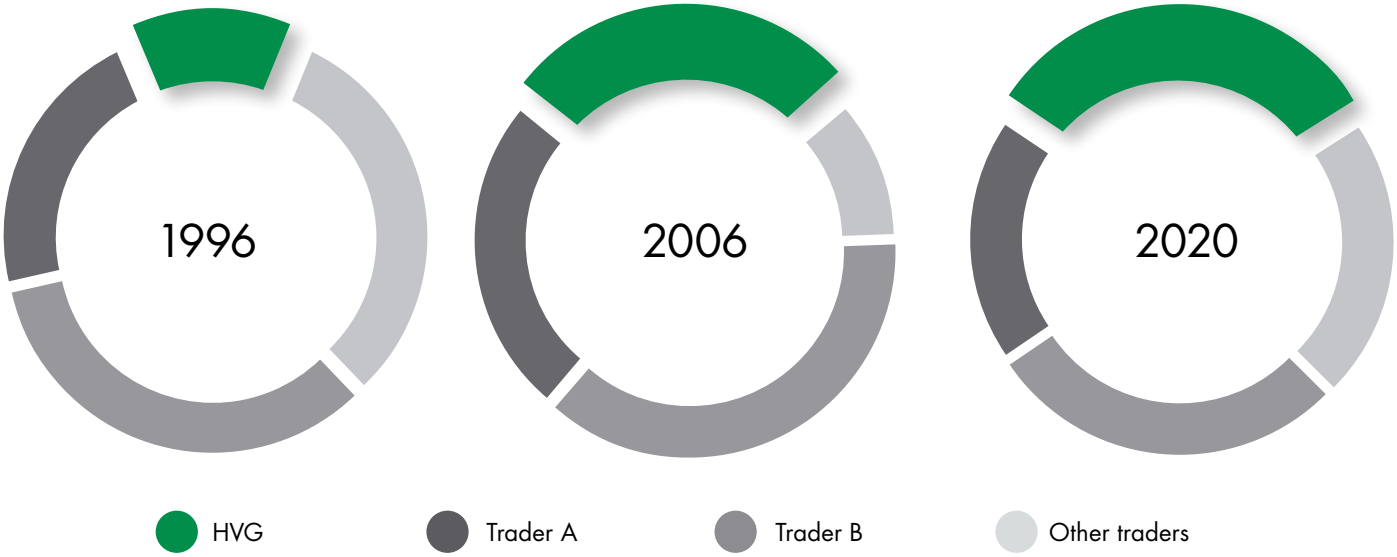


Chairman:
Adolf Schapfl

Deputy Chairman:
Alois Widmann

Members of the Board:
Stefan Arnegger, Christian Berthold, Sebastian Burger, Robert Drexler, Albert Eisenmann, Reiner Joachim, Simon Locher, Georg Lutz, Georg Nutz, Bartholomäus Obster, Karl Pichlmeyer, Anton Schlagbauer, Martin Schlittenbauer, Dirk Schumacher

Market share of German hops marketed directly through the HVG:



16,700,000
Germany

20,417
Hops (0.146%)
Land used for agriculture in ha 2019

263,500
Germany

1,097
Hop farms
Agricultural holdings 2020

12.81
2010
in hop cultivation

18.61
2019
(+ 45.2%)
Trend in hop area per grower, in ha

EU farm subsidies 2019
€6.8bn
Germany

€2.3 m.
Hops
(0.034%)
EU subsidy for hop producer associations

€67bn
Germany

€334.3 m.
Hops
(0.5%)
Value of agricultural exports 2019

34,110
Germany

11
Hops
(0.03%)
Number of organic farms

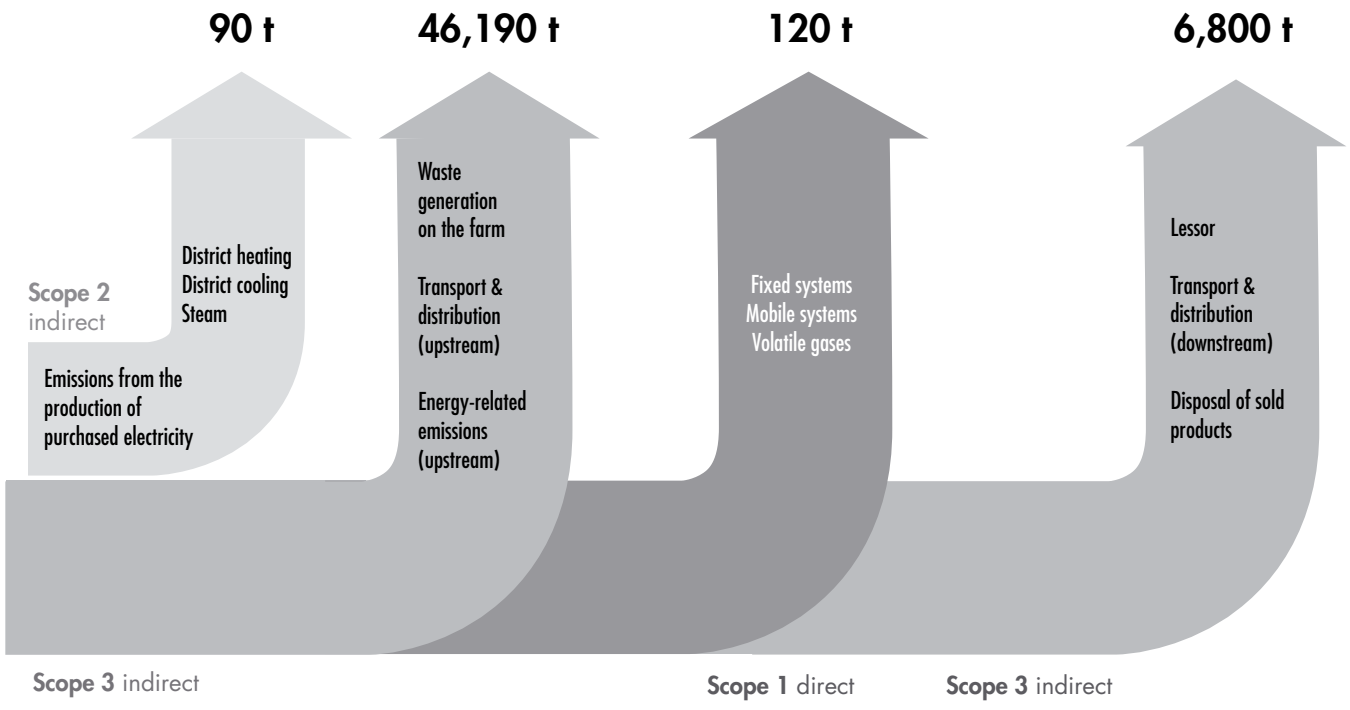
Position of hops in German agriculture as a whole

Carbon footprint of the HVG 2018/2019

We are very conscious of the impact of our activities on the climate. Where do the emissions occur and to what extent? We identify potential for reducing emissions by pinpointing and balancing the sources of emissions.

	Cause of CO_2e emissions	HVG cause	HVG emissions (in tonnes CO_2e)
Scope 1	**(Own company)**		
	Fixed systems	Fuel oil	23.00 t
	Mobile systems	Diesel vehicles + trucks	97.00 t
	Volatile gases	–	–
Result of Scope 1			**120.00 t**
Scope 2	**(purchased energy)**		
	District heating	District heating	9.00 t
	District cooling	–	
	Steam	–	
	Emissions from the generation of purchased electricity	Electricity consumption Wolnzach + Mainbur	81.00 t
Result of Scope 2			**90.00 t**
Scope 3	**(upstream value chain)**		
	Commuting of employees	–	
	Purchased goods	hop production	46,000.00 t
	Procured services	–	
	Production equipment/fixed assets	–	
	Business trips	Air travel	130.00 t
	Lessees	–	
	Waste generation on farms	–	
	Transport and distribution (upstream)	Logistics, transport of whole hops	60.00 t
	upstream energy-related emissions	–	
Result of Scope 3 (upstream)			**46,190.00 t**
Scope 3	**(downstream value chain)**		
	Payroll processing	St. Johann	2,690.00 t
	Payroll processing	Wolnzach - NATECO2	3,310.00 t
	Investments	–	
	Use of sold products	–	
	Further processing of sold intermediate products	–	
	Lessors	–	
	Transport and distribution (downstream)	Truck logistics for hops	215.00 t
	Transport and distribution (downstream)	See freight logistics for hops incl. trucks	585.00 t
	Disposal of sold products	–	
Result of Scope 3 (downstream)			**6,800.00 t**
Result of Scope 3 total			**53,200.00**

The HVG's carbon footprint



CO_2 emissions 2018/2019 along HVG's value chain
Scopes according to the GHG Protocol (own representation based on GHG Protocol)

Source: in-house calculations

Result overview 2018/2019 (in t)

	HVG emissions
Scope 1	120.00
Scope 2	90.00
Scope 3 (upstream)	46,190.00
Scope 3 (downstream)	6,800.00
Total	53,200.00

Whole hops (in tonnes)	CO_2e emissions (kg) per kg whole hops	of which CO_2e emissions from hop production (kg) per kg whole hops
12,000	4.43	3.8

Medium and long-term description of the most important risks and opportunities of sustainability trends for the organisation

Outlook

Ingenuity, courage and political support will all be needed...

The greatest challenge in the coming years will be to intensify the hop sector's already immense efforts to protect the environment while at the same time combining them with making the necessary adjustments to changes in the climate. As a relatively small speciality crop, we need the support of politicians, a great deal of ingenuity and, as growers, the courage to take the unconventional path. Numerous examples show that even large corporations can lose their relevance within a short period of time if they rest on their past successes and miss important trends.

We want to shape change. In the short term, we will switch to sourcing 100% of our electricity from renewable sources. Our medium-term goals include ensuring that 100% of our hop growers are certified as sustainable and that 50% of our hop growers have access to irrigation and fertigation.

Erich Lehmair

Dr Erich Lehmair
Deputy Chairman HVG e.G.

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