Environmental Technology from Bavaria

Solutions for Global Challenges

IHK Industrie- und Handelskammern in Bayern

UmweltCluster Bayern

Contents

Introduction

Today, the world faces a fundamental challenge: achieving economic growth without depleting the natural resources we depend on. Bavarian environmental technology sits at the heart of this challenge – and has done so for decades. The sector is part of a nationwide growth market that generated record revenues of over €107 billion in 2022 alone. Bavaria's leading position in this field is no accident. In 1970, Bavaria sent a clear signal by establishing Germany's first Ministry of the Environment, thereby creating a stable foundation upon which a unique ecosystem of research and industry could develop over the decades.

That ecosystem is now entering a new, highly dynamic phase. GreenTech "Made in Bavaria" is increasingly defined by the intelligent fusion of ecology and digitalisation. Modern environmental solutions use artificial intelligence to optimise resource consumption in real time, route waste streams into a circular economy through smart sensors and proactively manage the energy demands of entire industrial complexes. The economic impact is substantial: Bavarian companies generated record revenues of €27.1 billion from traditional environmental protection products in 2020[1]. When considering the entire Bavarian environmental economy, including technologies for CO_2 reduction and energy efficiency – total revenues reach around €50 billion, placing the sector on a par with the automotive industry and mechanical engineering in its contribution to Bavaria's prosperity. Employment reflects this strength: Germany's environmental sector supported around 405,300 jobs in 2023.[2] What makes this particularly striking is that environmental impact continues to fall even as production rises. Global demand for these intelligent solutions is growing rapidly, and Bavarian and German environmental technologies have a long track record of becoming international export successes. Bavarian companies in this sector see themselves not merely as exporters of high technology, but as partners in a sustainable global transformation.

The environmental economy is a cross-cutting industry. For many companies operating in the environmental economy, environmental activities account for only a portion of their overall business operations. It is therefore not possible to state with absolute precision how many companies belong to Bavaria's environmental sector. Companies in the circular economy and wastewater treatment sectors, however, can be clearly classified as part of the environmental sector. Figure 1 provides an overview of the breakdown of this cross-sectoral industry into six key thematic markets and market segments.

This guide highlights current cross-cutting issues in the environmental economy in Bavaria, shows innovative solutions and numerous company examples, as well as regional stakeholders and contacts to help you access Bavarian environmental technology.

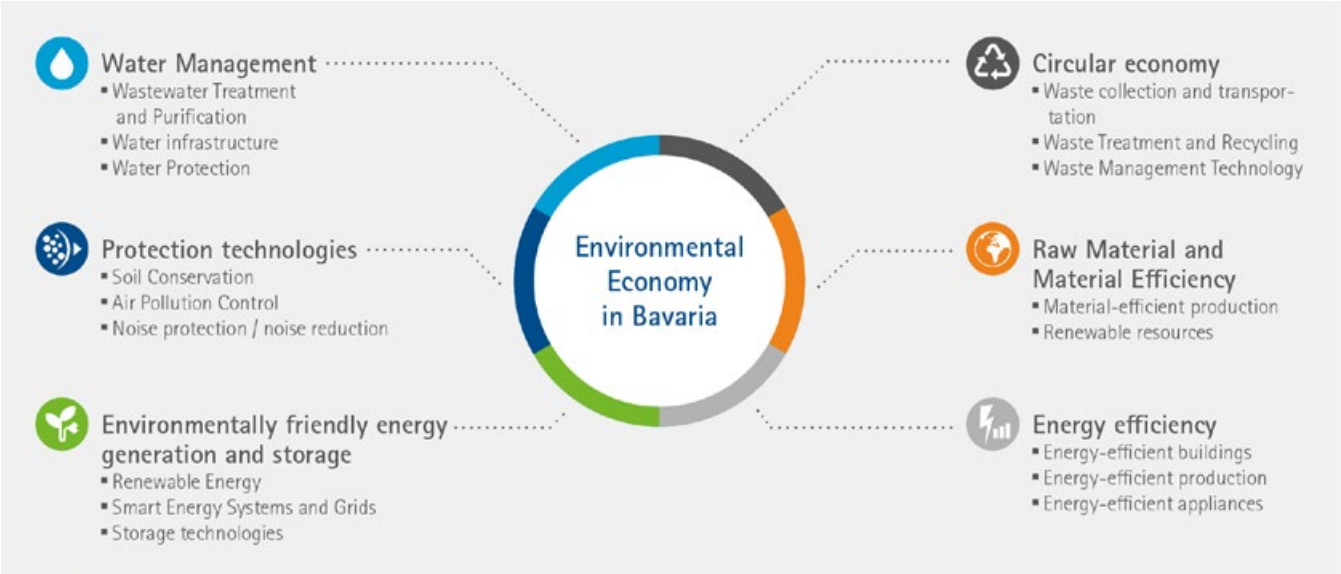

Fig. 1: Market segments of Bavaria's environmental economy. Created by the author based on the 2019 study "The Environmental Economy in Bavaria" by the Bavarian State Ministry of Economic Affairs (StMWi).

[1] statistikportal.de/de/ugrdl/ergebnisse/umweltschutz/uwi#6512
[2] destatis.de/DE/Themen/Gesellschaft-Umwelt/Umwelt/Umweltoekonomie/_inhalt.html

Overview of current cross-cutting Issues

Making businesses and infrastructure climate-resilient

Climate change is no longer a distant threat – its effects are already being felt across Bavaria and are increasingly shaping day-to-day business operations. Extreme weather events are damaging buildings and facilities, heat waves are raising temperatures in production and warehouse areas, employees face growing health risks, and supply chains are being disrupted. On top of this, insurance and financing conditions are shifting, and reporting requirements are expanding. Addressing these risks effectively requires an early, structured, and holistic approach. An article in the Chamber of Industry and Commerce (IHK) magazine of the IHK for Munich gives a good overview over growing physical risks of climate change for businesses – such as heat, drought, heavy rain, and flooding – as well as their operational impacts. The starting point for mitigation and adaptation is a systematic analysis of climate-related hazards in the company's immediate vicinity. It is also necessary, to analyse supplier countries and search on alternative markets and subsitutes. Building on this, appropriate measures must be developed and implemented. In addition to structural and organizational protective measures, the involvement of employees, supply chain partners, and the company's own customers in climate adaptation is a key component. At the same time, early adaptation measures can spur innovation, open new business areas, and create competitive advantages through sustainable and future-proof corporate strategies.

Companies can take the first steps toward climate resilience and climate adaptation measures by using the tools provided by the "Climate-Conscious Business Service Center" of the Environmental Economy Information Center at the Bavarian State Office for the Environment to conduct an initial assessment of operational measures or their own CO_2 consumption. Companies with planning expertise, such as the members of the Environmental Cluster, assist with climate risk analysis, the planning of adaptation measures for existing buildings, or the planning of measures for new construction.

Circular Economy and Transformation

The term 'circular economy' captures the essence of one of today's most important economic transitions: the shift away from linear "take-make-dispose" production patterns toward a model that keeps products and materials in use for as long as possible. The goals are clear – reduce raw material consumption, secure supply chains, and decouple economic growth from resource use. As an economic model, the circular economy drives innovation, strengthens competitiveness, and improves raw material security. It is also a direct response to the interconnected crises of climate change, biodiversity loss, and global trade disruption.

At the policy level, the EU has made this transition a central pillar of its agenda through the EU Green Deal and the EU Circular Economy Action Plan (CEAP). In 2025, the Green Deal was complemented by the Clean Industrial Deal. At national level, the German federal government adopted its National Circular Economy Strategy3 at the end of 2024, setting out ten areas of action – from strengthening digitalisation to circular product design and resource-efficient manufacturing.

Bavarian companies are responding positively. A regional breakdown of the 2024 DIHK circular economy survey shows that the majority of Bavarian respondents see the transition as an opportunity and have already begun integrating circular elements into their business models – whether through the use of recycled materials, digital process optimisation, or a shift toward more sustainable products.

The recycling of plastics offers many opportunities and challenges. To address this, the Fraunhofer Institute for Environmental, Safety, and Energy Technology (UMSICHT) in Sulzbach-Rosenberg is conducting research on mechanical and chemical recycling technologies for plastics. Technically, processes such as pyrolysis already make a great deal possible, but the wide variety of plastics and plastic compounds, as well as access to the recyclable materials, remain major hurdles for recycling.

Bavarian companies offer innovative solutions for sorting and processing plastics into high-quality recyclates. A particular challenge is the use of plastic recyclates for high-precision applications in the manufacturing sector, such as components in the automotive industry. Fierce competition from virgin plastics made from fossil fuels continues to put the industry under enormous pressure.

[3] Quelle: kreislaufwirtschaft-deutschland.de/

Water

Water is essential to life and central to Bavaria's economy. Its waterways serve a wide range of industrial purposes – irrigation, cooling, process water, drinking water, energy generation, and transportation. As climate extremes grow more frequent, however, water availability is becoming less predictable, and competition for water use is intensifying. New approaches to water management are needed.

Considering changing water availability due to climatic extremes such as flooding or drought, competition for water use is also increasing in Bavaria and requires new approaches and measures in the field of water management.

A study by the Würzburg-Schweinfurt Chamber of Industry and Commerce on the topic "Water in the Region" examines the impact of drought on businesses in the Mainfranken region. The study examined the risks facing businesses and the measures that can be taken to minimize these risks. The analysis of the survey on water scarcity in the Mainfranken region clearly demonstrates that climate change increases the situation and leads to increasing challenges. The need for a holistic approach to water management that considers both corporate responsibility and political measures is clear. Through cooperative collaboration, companies can help mitigate the effects of water scarcity while simultaneously strengthening their own resilience and sustainability.

The members of the Environmental Cluster demonstrate that Bavaria is home to many companies that offer innovative solutions to the challenges of the climate crisis in the field of water management. Digital applications addressing various challenges in water treatment and flood monitoring support climate-resilient – and thus sustainable – water management. Solutions in recycling industrial wastewater, reducing water consumption through smart water management, and water-saving process planning in industry are further approaches. They demonstrate the high level of innovation in the Bavarian economy regarding environmental technology solutions for sustainable water management.

Best Practices

Bavarian flagship projects

Since 2008, the Bavarian Environmental Cluster has regularly awarded the "Leuchtturm Projekt" designation to projects that make a particularly exemplary contribution to the development of environmental technology in Bavaria and thereby help improve the climate and environmental situation. A Leuchtturm Projekt points the way toward future developments and demonstrates entrepreneurial courage and visionary thinking. With this designation, the Environmental Cluster awards companies, planners, municipalities, and consortia in Bavaria that have developed a project, product, or process with an innovative character. This makes innovative approaches visible and promotes best practices across the industry. The following technological developments have been recognized as lighthouse projects by the Bavarian Environmental Cluster. In 2024, the Leuchtturm Projekt was expanded and is now open to applications from established projects and innovative ideas.

Innovation for the future

Where others see challenges, the Bavarian Environmental Cluster network develops solutions. These flagship projects demonstrate what is possible when businesses, local governments, research institutions, and engineers work together: sustainable technologies, economic strength, and concrete contributions to climate protection – Made in Bavaria.

Impact of Leuchtturm Projects

Each of these projects embodies:
- A commitment to innovation
- Cross-sector collaboration
- Sustainable value creation
- Technological excellence from Bavaria

The Bavarian Environmental Cluster demonstrates what is possible when expertise is brought together. Together, we shape environmental technology that makes a difference – today and tomorrow. Outstanding and forward-looking projects are also recognized in other Bavarian networks focused on environmental technologies. For example, KUMAS annually awards the "Leitprojekte" designation.

kumas.de/category/leitprojekte/

Below you will find an overview of some Leuchtturm Projekte and KUMAS Leitprojekte.

Leuchtturm Projekt

2020

Every drop counts – a new approach to leak detection

Water is our most valuable resource – and yet significant amounts are lost every day in water distribution networks. The project "Leak Detection System for Drinking Water Pipelines" by T.O.M. was initiated as an intelligent response to the loss of water resources in nearly all drinking water pipeline systems and the time-consuming process of locating leaks.

The developed measuring device enables fast, precise, and clean loss measurement of supply sections – even in areas without a GSM network in the future.

An innovative product with international potential.

Project sponsor: Turn-off metering GmbH
Project partners:
- Dieter Martin Coach & Consulting Service
- GDS GmbH
- IRPD GmbH
- Kompetenzteam GIS GmbH
- Solus Sof

2020

Digital Integral Rehabilitation Strategy (DISS)

Until now, there has been a lack of standardized, digital assessment methods for pumping stations and special structures.

The DISS project closes this gap through:
- Systematic condition assessment
- Automated derivation of rehabilitation strategies
- Synergy between repair and optimization potential
- Reliable decision-making basis for investments

Developed with a focus on practical application and continuously refined.

Project sponsor: AmperVerband
Project partner: GFM Bau- und Umweltingenieure GmbH

2021

Construction Meets Energy – The Geothermally Activated Mixed-in-Place (MIP) Wall


Bildquelle: Guido Anacker

Two established technologies are intelligently combined: excavation shoring and geothermal energy. It is a smart move when the technology providers cooperate. This is exactly the case with the "Geothermally Activated Mixed-in-Place (MIP) Wall." Bauer Resources and Bauer Spezialtiefbau have supplemented an existing, resource-efficient process—which uses in-situ soil as a building material for securing excavation pits or sealing contaminated sites—with geothermal energy. To achieve this, geothermal loops are installed in the retaining wall and connected to the property's heat pump system for heating and cooling. The Leuchtturm 2021 Environmental Cluster recognizes an innovative process already implemented at two sites in which geothermal energy is extracted without the need for additional drilling or extensive construction work.

Project sponsor: BAUER Resources GmbH
Project partner: BAUER Spezialtiefbau GmbH

2022

From Landfill to Energy Source – Karlstein-Dettingen

Remediation and energy generation are combined:
A photovoltaic system is being built on a remediated landfill site. Some of the electricity generated is converted into hydrogen and reused.

A flagship project for:
- Land recycling
- Renewable energy generation
- Sector coupling
- Future-proof infrastructure

Project sponsor: Stadtwerke Aschaffenburg
Project partner: R & H Umwelt GmbH

2023

Germany's first local heating network to feed green PV electricity into a large-scale heat pump

KUMAS-Leitprojekt 2023: In Mertingen, in the Donau- Ries district, GP JOULE and the municipality are implementing a project unique in Germany for climate-neutral heat supply. The existing local heating network is being expanded to include Germany's first large-scale industrial heat pump, which is powered by locally generated electricity from photovoltaic systems, efficiently storing and feeding it back as heat. This allows residents to benefit from a cost-effective, fully renewable heat supply that generates regional economic value.

Project sponsor: GP Joule
Project description: kumas.de/wp-content/uploads/2024/03/GP-Joule-LP-2023-1.pdf

2025

Water purification systems for on-site destruction of PFAS and trace substances

PFAS (per- and polyfluoroalkyl substances) – so-called "forever chemicals" – pose a major challenge worldwide.

The project is developing water purification systems with innovative diamond electrodes that:
- Operate without chemicals
- Are energy-efficient
- Do not require critical raw materials
- Are low-maintenance and scalable

This marks the transition from a niche solution to broad application for clean water.

Project sponsor: CiX GmbH

2025

Production of highly plant-available phosphorus fertilizer from sewage sludge ash

KUMAS-Leitprojekt 2025: Emter GmbH produces a high-quality, plant-available phosphate fertilizer from municipal sewage sludge that meets the requirements of the Fertilizer Ordinance and can also be used in organic farming. The basis for this is an energy-efficient and sustainable thermochemical process developed in collaboration with the Federal Institute for Materials Research and Testing.

Project sponsor: Emter GmbH
Project description: kumas.de/wp-content/uploads/2026/01/KUMAS-LP-Banner-Emter_2025.pdf

Cluster of Environmental Technologies Bavaria

UmweltCluster Bayern

The Bavarian Environmental Economy Network

As part of the Bavarian Cluster Initiative, the Bavarian State Government is actively promoting collaboration between industry and academia to strengthen Bavaria's position as a business hub in the long term.

The Bavarian Chambers of Industry and Commerce have actively driven this process forward in the environmental sector – particularly for the numerous small and medium-sized enterprises in the industry. In doing so, they have significantly shaped the strategic direction and the development of cluster management.

This close collaboration has resulted in a strong, long-term partnership with a joint work program.

Globally connected. Rooted in Bavaria

Based in Augsburg, the Bavarian Environmental Cluster has evolved into the industry network for Bavaria's environmental sector.

Working closely with policymakers, researchers, academic institutions and research centersas well as the business community, the Environmental Cluster focuses on:
- Knowledge and technology transfer
- Promoting innovation
- Initiating and expanding collaborations
- International networking.

Internationalization – your path to new markets

The Bavarian Environmental Cluster actively supports its members in expanding into international markets and connects them with customers and partners around the world.

Thanks to close cooperation with international clusters, business and scientific institutions, as well as the Bavarian representative offices abroad and chambers of foreign trade, the cluster has strong contacts in key target markets and offers:

- Access to international markets
- Individual and personal exchanges with contacts in Germany and abroad
- Exchange among members regarding specific target markets
- Participation in delegation trips abroad
- Hosting international delegations in Bavaria
- Presentation at joint booths at international trade fairs

The goal is to sustainably strengthen the innovative capacity, competitiveness, and internationalization of its members- rooted in the region and successful globally.

Added value for over 200 members

The Bavarian Environmental Cluster offers its members:

- A strong network with in-depth industry expertise
- Expert working groups on current and future-oriented topics
- Innovation platforms for initiating joint projects
- International contacts, projects, trade shows, and funding programs
- Support for value creation and market development

The Environmental Cluster serves as a forum for industry trends, a catalyst for innovation, and a launchpad for international activities.

Competitiveness through innovation

Through events, working groups, and collaborative projects, the Environmental Cluster promotes the continuous exchange of information and innovation among its members.

Typical topics include, for example:

- Working group topics: Wastewater heat recovery, decentralized wastewater treatment, micropollutants, landfill technology, energy from waste
- Projects on the topics of: circular economy, recyclable product development, renewable raw materials in the plastics industry, textile recycling, AI in environmental technology

As a project partner, the Environmental Cluster supports companies and institutions in initiating, developing, and implementing joint projects—regionally, nationally, and internationally.

A strong partnership: Chambers of Industry and Commerce and the Environmental Cluster

The Bavarian Chambers of Industry and Commerce have actively shaped the cluster process from the very beginning and assumed responsibility for it in 2006.

The Chambers' extensive experience in regional economic development complements the industry-specific expertise of the Environmental Cluster perfectly.

This collaboration forms the basis for a joint work program – with a clear focus on innovation, support for small and medium-sized enterprises, and sustainable economic development.

Expertise across the Entire Value Chain

The Environmental Cluster brings together the expertise of its members in key areas of the environmental sector:

- Waste & Recycling
- Alternative Energy
- Soil & Contaminated Site Remediation
- Air Quality Control
- Resource Efficiency & Material Flow Management
- Water & Wastewater

The close integration of these areas of expertise leads to integrated, practical environmental technology solutions.

Internationalization: A leading competence of Chambers of Industry and Commerce

The Bavarian Chambers of Industry and Commerce and the Bavarian Environmental Cluster work hand in hand

Entering a new international market takes more than a good product. Companies need a sound market entry strategy, an understanding of local needs, and a clear grasp of the administrative, legal, and economic conditions of their target market. Through the Chambers of Industry and Commerce and the Bavarian Environmental Cluster, Bavarian companies gain exactly this – access to information, international contacts, and practical support through joint state-level events, delegation visits, and trade fair participation abroad. The IHKs' breadth of experience and the Environmental Cluster's specialist industry knowledge are a natural fit.

The Chambers of Industry and Commerce (IHKs) are the point of contact for all export-oriented companies

Anyone who exports goods abroad or imports them into Germany will have to deal with customs. The regulations are numerous and complicated. The Chambers of Industry and Commerce (IHKs) assist companies with these and other questions: Which goods can be exported where? What regulations must be observed in the respective country? Are there any special precautions that must be taken in a particular country?

Go international

The "Go International" funding program, managed by the Bavarian Chambers of Industry and Commerce in collaboration with the Bavarian Chambers of Crafts (HWK), helps small and medium-sized enterprises (SMEs) expand internationally. The companies receive financial and advisory support in tapping into new foreign markets. Up to two target countries per company are eligible for funding. The project is funded by the EU under the European Regional Development Fund and by the Free State of Bavaria. To date, approximately 1,800 companies have received a total of over 9 million euros in funding.

go-international.de

Dienstleistungskompass.eu

The web portal Dienstleistungskompass.eu provides a clear overview of information regarding the provision of services abroad, including explanations, practical tips, and examples for the most important EU countries, as well as Switzerland and Norway. In particular, the platform contains information on the legal requirements abroad that must be observed to avoid penalties when providing cross-border services. Among other things, the following questions are answered: Where and how do I need to register my employees? What documents must be kept on hand? What should be considered regarding employment contracts and social security?

dienstleistungskompass.eu

The German Chambers of Commerce Abroad – Chambers for Greentech

With their on-the-ground networks and market expertise, the German Chambers of Commerce Abroad (AHKs) are the go-to contact for understanding market developments and opportunities internationally – especially in the fast-growing environmental technology sector. As part of the Federal Government's Environmental Technology Export Initiative, the AHKs are expanding their capacity in this area, with a focus on the circular economy, water management, and hydrogen.

dihk-service-gmbh.de/de/unsere-projekte/greentech/

Other networks, institutions, and platforms in the environmental sector in Bavaria

Bifa

Bifa conducts research for practical application – resource-efficient, sustainable, and climate-friendly. As one of the leading application-oriented research, development, and consulting institutions in Germany, they offer diverse, practice-oriented environmental research and have established a robust research network.

bifa.de

"Key to Bavaria" Business Directory

The "Key to Bavaria" platform allows users to search specifically and free of charge for Bavarian products, services, and technology partners. By listing their businesses in this directory, companies based in Bavaria can promote their business opportunities both domestically and internationally.

keytobavaria.de

IHK ecoFinder Plus: Platform for Environment and Energy

The IHK ecoFinder, operated by the Chambers of Industry and Commerce, has been providing a comprehensive overview of service providers, consultants, manufacturers, and distributors in the environment and energy sector for more than 20 years. At the start of 2026, the IHK ecoFinder Plus was launched as a new platform. The new regional concept aims to once again bring together technology providers in the regions of Bavaria.

Tip:
Do you offer products and services in these sectors yourself? Then register at:
ihk-ecofinder-plus.de/registrierung or contact your regional Chamber of Industry and Commerce.
ihk-ecofinder-plus.de

KUMAS – Environmental Competence Center, Inc.

Since its founding in 1998, KUMAS has established itself as a central hub for sound environmental expertise, based in Bavarian Swabia, and is an association of companies, municipalities, chambers of commerce, and scientific and educational institutions. KUMAS conferences are recognized throughout Germany. They bring together experts from plant operations with representatives from federal and state authorities for a technically sound exchange and also serve as a networking platform.

kumas.de

Resource Efficiency Center Bavaria (REZ)

The REZ serves as the central point of contact for the circular economy and for corporate raw material and resource efficiency in Bavaria, and coordinates the Bavarian Circular Economy Strategy. Every two years, the REZ presents the Bavarian Resource Efficiency Award to recognize Bavarian companies that use natural resources sustainably and thus play a pioneering role in this field.

rez.bayern.de

UTG – Environmental Technology Incubator Augsburg GmbH

The hub for young companies and tech startups in the fields of environmental technology and resource efficiency. Infrastructure, services, and networking support founders during their first few years. The Swabian Chamber of Industry and Commerce (IHK) and Chamber of Crafts (HWK), as well as the "Augsburg Grounds!" initiative, are key partners in this effort.

u-t-g.de

Legal Notice

Publisher and Editor:
Bavarian Association of Chambers of Industry and Commerce (BIHK) e. V.
Board of Directors: Peter Inselkammer and Dr. Manfred Gößl
Max-Joseph-Straße 2
80333 München
089 5116-0
info@bihk.de
bihk.de

Contact:

Umweltcluster Bayern
Trägerverein Umwelttechnologie-Cluster Bayern e. V.
Am Mittleren Moos 48
86167 Augsburg
0821 455 798-0
info@umweltcluster.net
Umweltcluster.net

IHK Aschaffenburg
Andreas Elsner
06021 880-0
elsner@aschaffenburg.ihk.de

IHK für Oberfranken Bayreuth
Frank Lechner
0921 886-0
lechner@bayreuth.ihk.de

IHK zu Coburg
Rico Seyd
09561 7426-0
rico.seyd@coburg.ihk.de

IHK für München und Oberbayern
Sabrina Schröpfer
089 5116-0
schroepfer@muenchen.ihk.de

IHK für Niederbayern in Passau
Erich Doblinger
0851 507-0
erich.doblinger@passau.ihk.de
Martin Nätscher
0851 507-0
martin.naetscher@passau.ihk.de

IHK Nürnberg für Mittelfranken
Dr. Marcus Seitz
0911 1335-0
marcus.seitz@nuernberg.ihk.de

IHK Regensburg für Oberpfalz / Kelheim
Tobias Hornauer
0941 5694-0
hornauer@regensburg.ihk.de

IHK Schwaben
Melanie Hornikel
0821 3162-0
melanie.hornikel@schwaben.ihk.de

IHK Würzburg-Schweinfurt
Oliver Freitag
0931 4194-0
oliver.freitag@wuerzburg.ihk.de
Dr.-Ing. Panalee Chevakidagarn
0931 4194-0
panalee.chevakidagarn@wuerzburg.ihk.de

Editorial Team:

Sabrina Schröpfer, Chamber of Industry and Commerce for Munich and Upper Bavaria
Claudia Schwarz, Bavarian Environmental Cluster

Design:
Ideenmühle GmbH, Eckental

Image credits:
Cover: Adobe Stock © Kalyakan, S. 4: iStock © vicvaz, S. 5: Adobe Stock © Sansert, S. 6: Adobe Stock © Sebastian Studio, S. 8: Turn-off metering GmbH /AmperVerband, S. 9: Guido Anacker / fabersam@pixabay, S.10: GP JOULE / CiX GmbH, S. 11: Hupp-Drobusch Filmproduktion

As of March 2026

IHK Industrie- und Handelskammern in Bayern

We're here for you

The Chambers of Industry and Commerce in Bavaria

The Bavarian Association of Chambers of Industry and Commerce (BIHK) is the umbrella organization for the nine Chambers of Industry and Commerce in Bavaria. All Bavarian companies – except for craft businesses, independent professionals, and agricultural enterprises – are required by law to be members of a Chamber of Industry and Commerce. Consequently, the BIHK represents approximately 990,000 companies of all sizes and across all industries: from globally operating corporations to owner-managed small and medium-sized enterprises. The BIHK is not dependent on any specific group of companies but represents the overall interests of the commercial sector in Bavaria. Since its founding in 1909, it has been the largest business organization in the Free State of Bavaria.