

Thinking Ahead

Sustainability Report 2024

Foreword

Dear readers,

On behalf of the Grenzebach Group, we are delighted to be able to present to you our latest sustainability report. It is an expression of our commitment to a future-focused world, shaped by our enduring strategy and the values that have guided us for more than 65 years. Quality, a sense of responsibility, appreciation, sustainability, and reliability are the cornerstones of what we do and how we act with one another. It is these values that guide us on our path toward a better tomorrow.

We firmly believe that financial success goes hand in hand with sustainable and socially responsible action. This is why we have made it our goal to never stop scrutinizing and optimizing our practices. With this approach, we are able to make a contribution to society and for the environment as well as remain committed to our responsible and sustainable use of our resources.

This report reveals how we integrate this sustainability into all the divisions, departments, and sites that make up our Group. The unique talents and perspectives held by each and every individual empower us to develop innovative solutions and to tackle tasks with a creative approach. This way of working together, coupled with the unmistakable Grenzebach spirit, helped us to rise to unexpected challenges once again last year and, together with our customers, to shape the changes in the markets. Time and again over the past 65 years, we have demonstrated this confidence, resolve, and justified optimism, which still serve to guide our future actions in the circular processes all around us.

We would like to express our heartfelt thanks to our dedicated colleagues, who contribute their expertise and passion day in and day out. Their commitment truly is the key to our success and shows just how fundamental teamwork is to the realization of our vision for sustainability and economic efficiency.

Finally, we wish to invite you, dear readers, to join us on our journey. Please give us your feedback so that we might work together toward a more sustainable future for the generations of today and tomorrow.

Thank you so much for your interest in the Grenzebach Group.



Dr. Steven Althaus
CEO
Grenzebach Group



Ralf Jäger
SVP Operation & Sustainability
Grenzebach Group



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*To improve readability, plural pronouns are used in this text to refer to a singular subject of any gender.

EXECUTIVE SUMMARY

The Grenzebach Group is an international, family-controlled group of companies that has been offering customized automation solutions for the glass and building materials industry as well as other industries for over 60 years. With a global presence and around 1,600 employees, Grenzebach focuses on innovation, flexibility, and sustainability. The company follows a clear strategy to seize opportunities in times of change and enable long-term success through agile processes and close collaboration with customers, partners, and employees.

Grenzebach's dedication to sustainability is reflected in the continuous improvement of its products and services and the implementation of environmentally friendly technologies. The Group is committed to significantly reducing CO2 emissions, using resources efficiently and to continuously improve the energy efficiency of the Group and its customers.

Innovative projects, such as asphalt recycling or the water condenser demonstrate Grenzebach's pioneering spirit in the field of sustainable solutions.

Grenzebach creates trust through transparent communication with stakeholders and promotes a culture of shared success. The Group is committed to fair working conditions, occupational safety, and diversity in the workplace. In addition, the Group sees itself as a strategic partner to its stakeholders and focuses on long-term relationships based on close cooperation and dialog.

The sustainability strategy blends in seamlessly with the Grenzebach Group's NEXT strategy. The latter strategy is designed to identify opportunities in the global market while also proactively managing risks. Grenzebach intends to achieve ambitious targets by 2050 like continued reduction of CO2 emissions, increased energy efficiency in production and its solutions, and strengthen its clear commitment to environmental responsibility.

With its innovative spirit and deep understanding of market needs, the Grenzebach Group is a reliable journey partner for its customers on the road to a sustainable future.



sustainable
be Grenzebach

NEXT GRENZEBACH

From Hamlar into the World

The Grenzebach Group develops tailor-made automation solutions for the global glass and building materials industries. In addition, we are constantly tapping into new application areas, such as various recycling methods, friction stir welding, automation of additive manufacturing, digital networking, or solutions for an intelligent energy infrastructure. Since the company was established in 1960, Grenzebach has been family-owned. This influences the Group's strategy and collaborative approach to this day.

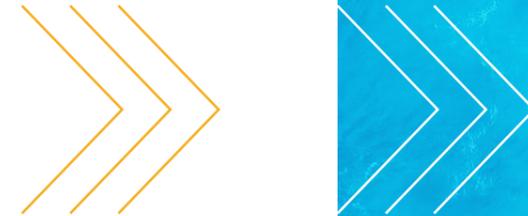
By the end of 2024, the Grenzebach Group employed approximately 1,600 people around the world. The headquarters of the internationally active group of companies is Grenzebach Maschinenbau GmbH, based in Asbach-Bäumenheim, Hamlar, in the Donau-Ries district of Bavaria, Germany.

GRENZEBACH'S GLOBAL NETWORK

Strong Together

The Group's main manufacturing and development facilities are located in Germany (Hamlar, Bad Hersfeld), Romania (Iasi), USA (Newnan, GA), China (Jiashan, Shunde), and India (Pune). Subsidiary company Millennium headquartered in Beachwood, Ohio, completes the Group's network and strengthens its market presence in the USA.

WITH AN EXPORT QUOTA OF OVER
90%
GRENZEBACH IS A GLOBAL PLAYER IN ITS CORE MARKETS.





"OUR VISION FOR THE PUNE FACILITY IS CLEAR: WE WANT TO UNITE INNOVATIVE STRENGTH AND CUSTOMER FOCUS TO GROW AS A RELIABLE PARTNER FOR THE REGION AND TO MEET OUR CUSTOMERS' REQUIREMENTS AS EFFECTIVELY AS POSSIBLE."

Prasanna Hegde
Managing Director of Grenzebach India (Pune)



SUSTAINABLE GROWTH

Site Expansion in Pune, India

2024 marked a major milestone in the Grenzebach Group's strategy for sustainable growth and development: the expansion of the facility in Pune (Chakan), India.

On February 15, 2024, we officially celebrated the opening of our new manufacturing and development facility. With a site spanning 4,500 square meters and creating some 30 new jobs, we are sending a clear signal of our innovative prowess and our commitment as a strong employer in the region around Pune.

Expansion with Added Value

The expansion of the facility allowed us to satisfy the growing demand for solutions in the glass and construction material sectors while also strengthening our network in the Eastern Hemisphere.

Teamwork as a Catalyst

Teamwork was fundamental to the expansion of the facility. Only with the close collaboration of interdisciplinary teams and effective communication with local partners and employees were we able to make this project a success. Our Indian team is always contributing ideas for how the expansion could not only bring financial benefits, but also how it could serve as a model for sustainable practices. In 2024, the team in Pune successfully implemented eight targeted measures relating to sustainability and Corporate Social Responsibility (CSR). These include

1. Carpools

At the Pune site, we actively promote carpools as a sustainable transport solution. By sharing lifts, our employees save money

on fuel, toll fees, and parking charges, as well as reducing the wear and tear to their vehicles. Carpools also help to reduce the traffic, emissions and the stress of commuting.

2. Electric Forklifts

In production, we have switched to zero-emission electric forklifts. These quiet and low-maintenance vehicles improve the working conditions while also supporting our sustainability targets.

3. Tree Planting Initiative

In July, our Pune site organized a major initiative to plant trees on Baner Hill. The sense of motivation was plain to see, because everyone was making an active contribution to improving the air quality and enhancing biodiversity in the vicinity of our site.

4. CSR Projects

Through a variety of social projects—such as supporting schools, education programs and local collectives—our team was able to actively contribute to social development in the local area last year. These actions not only provide a boost to local community, but they also enhance the sense of belonging.

5. Safety Week

Every year, we take an active role in Safety Week to raise awareness surrounding occupational safety and to foster a safety culture. In the reporting year, training courses, practical exercises, and interactive formats were central to empowering our employees to recognize risks early on and to approach these in a responsible manner.

6. Ayudh Pooja

During the traditional Ayudha Pooja festival, our employees in Pune celebrated their appreciation of tools, machines, and the workplace. This ceremony, deeply rooted in Indian

culture, symbolizes respect toward those work materials and tools that make our daily work possible. It strengthens team spirit, promotes courteous co-existence, and generates a shared consciousness for a respectful and appreciative work environment.

7. Health and Well-being

2024 also saw our Pune-based employees mark International Yoga Day with a guided yoga session. This joint activity promoted physical and mental well-being, while also strengthening the team's bond and raising awareness of the importance of a healthy lifestyle in the workplace.

8. A Conscious Approach to Resources

In 2024, we succeeded in reducing our energy and water usage, as well as diesel consumption, by means of various measures. This progress is the outcome of our joint endeavors to increase resource efficiency and to encourage sustainable operational processes at our Indian site.

We are planning further initiatives for 2025, including more tree planting, introducing biodegradable pallet wrapping, measures to reduce waste, and a "Clean Drive" campaign to raise environmental awareness.



Values that Shape Us

From the very beginning, Grenzebach has won key markets through its passion, its open mind, and its pioneering spirit. You sense it straight away: the employees of the Grenzebach Group are truly dedicated and form a vibrant community that keeps developing and stays true to our core values. To this day, with a workforce of some 1,600, the collaboration at Grenzebach is still built around reliability, stability, enthusiasm, and mutual respect—both internally and externally.

THE BeGRENZEBACH VALUES FORM THE BASIS FOR THIS TRUSTING AND RESPECTFUL COEXISTENCE AND ARE PERMANENTLY INGRAINED IN THE GROUP'S DNA, WHICH IS PASSED ONTO EACH AND EVERY EMPLOYEE.

be QUALITY-CONSCIOUS

We think ahead and continuously optimize the efficiency and effectiveness of our products and processes.

be RESPONSIBLE

We always act responsibly towards our employees, colleagues, customers, and our environment.

be APPRECIATIVE

Our employees are our most valuable asset. We build on long-term customer relationships.

be SUSTAINABLE

We are careful to make sustainable use of the required resources.

be RELIABLE

We deliver what we promise – internally and to our customers.

WE ARE GRENZEBACH

People You Can Count On

What gives Grenzebach its strength is the people behind the group of companies. When you work with people at Grenzebach, you meet individuals that bring their skills and their personality into their projects and their daily work. That is why the Grenzebach Group takes great pride in creating a place where these people can truly flourish, achieve their potential, and feel safe.



"I have chosen Grenzebach because the company perfectly combines tradition, innovation and globalization. I am really impressed by the building materials expertise of my colleagues. During my school days, I already visited Grenzebach on an excursion and was impressed by what I saw. This motivated me to apply here."

Aras Alabd
Mechanical Engineering Dual Studies

"I started my career as an Office Manager at Grenzebach Hellas not long ago but that was enough to feel part of a great team and effective member of a company leader in its field. No stronger motivation for either an employee or a manager than an understanding that your work matters!"

Ioanna Giagki
Office Manager (Finance/Admin/HR) Grenzebach Hellas

"Working for Grenzebach is just a lot of fun. First, because there is a great atmosphere in the teams. Secondly, because you can actively participate in projects and processes, have great creative freedom and push forward with brave ideas. Everybody works together. This makes us a reliable and strong partner for our customers."

Stefan Wilfling
Head of Project Engineering, Intralogistics

From People for People

We firmly believe that every investment in the Grenzebach Group is also an investment in the local people. This is why Grenzebach takes particular care to its image as an attractive employer; one who supports the local economy and creates opportunities for the community. By offering highly regarded jobs around the world and driving sustainable initiatives, the Group is able to stimulate both economic and social growth in those regions where we locate our sites. At the same time, we realize our vision of a responsible and forward-looking corporate management.

NEXT TECHNOLOGIES

From Vision to Reality

From the moment Grenzebach was founded, the Group has been dedicated to customized automation solutions. Around the world, Grenzebach has made its name in plant engineering for the glass and building material sectors. The solutions in the fields of process engineering, energy infrastructure, additive manufacturing, and casting or friction stir welding facilitate future-oriented change. Grenzebach's profound understanding of its customers' needs and expectations, as well as market trends, makes the Group a strategic partner in the field of industrial automation.

Being a globally operational group with its roots firmly in a family-owned company, the Grenzebach Group embodies reliability, flexibility, and innovative spirit. With these attributes, we accompany customers worldwide throughout the entire value chain and even beyond the full life cycle of the product.

SPECIAL TECHNOLOGIES

DIGITALE LÖSUNGEN

INTRALOGISTICS

GLASS PRODUCTION TECHNOLOGY

BUILDING MATERIAL PRODUCTION TECHNOLOGY

SERVICE

CONTROL SYSTEMS AND POWER & ENERGY

Glass Production Technology

In-depth process knowledge and decades of experience: Since 1974, Grenzebach has been creating added value for the international glass industry. Be it individual plant components or entire turnkey deliveries, Grenzebach is the optimum journey partner for advice, engineering, and project management.

Building Material Production Technology

From process engineering via automation solutions to entire production facilities—Grenzebach offers tailor-made solutions for the production of building materials in the fields of plaster, insulation, timber, process engineering, and recycling.

Intralogistics

Grenzebach uses hardware and software solutions to automate several industries. Customers benefit from solutions that are optimally tailored to their requirements.

Special Technologies

The Special Technologies division brings three of the Grenzebach Group's specialist technologies under one roof: cast part manufacturing, friction stir welding, and the automation of additive manufacturing.

Service

Grenzebach serves as a dependable partner throughout the entire life cycle of a plant—from development and planning to its realization and implementation—while staying true to its motto: We live service. Around the clock. Around the globe.

Digital Solutions

With SERICY, Grenzebach brings a digital software ecosystem that allows for production and the supply chain to be digitalized by various means, including artificial intelligence (AI), in the shortest time possible. This encompasses production control, surveillance, product tracking, or KPI visualization.

Control Systems and Power & Energy

Millennium is an automation expert for several sectors, providing support in the fields of control elements and energy systems: from the initial concept and implementation of new devices right through to improving existing processes.

NEXT FINANCES

Strong Foundations for Sustainable Decisions

For the Grenzebach Group, a strong financial foundation is important, because it

- » promotes stability and growth,
- » provides crisis resilience,
- » facilitates investment and innovation, and
- » builds trust among investors and partners.

This is why the Grenzebach Group has set itself the target of protecting its financial health and fostering solid long-term growth through sound financial decisions and careful investments in sustainable developments, infrastructure, and research and development.

Forward-thinking research and development are vital to the Grenzebach Group maintaining its innovative ability and market leadership.



483

MILLION EUROS
IN REVENUE

21

MILLION EUROS
IN EBIT

495

MILLION EUROS IN
INCOMING ORDERS

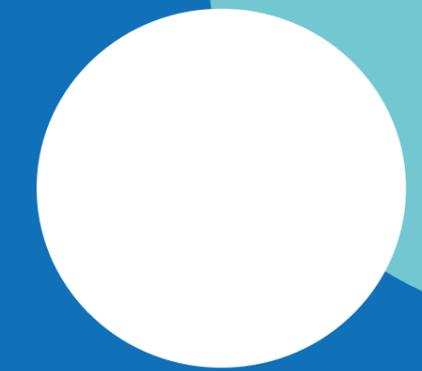
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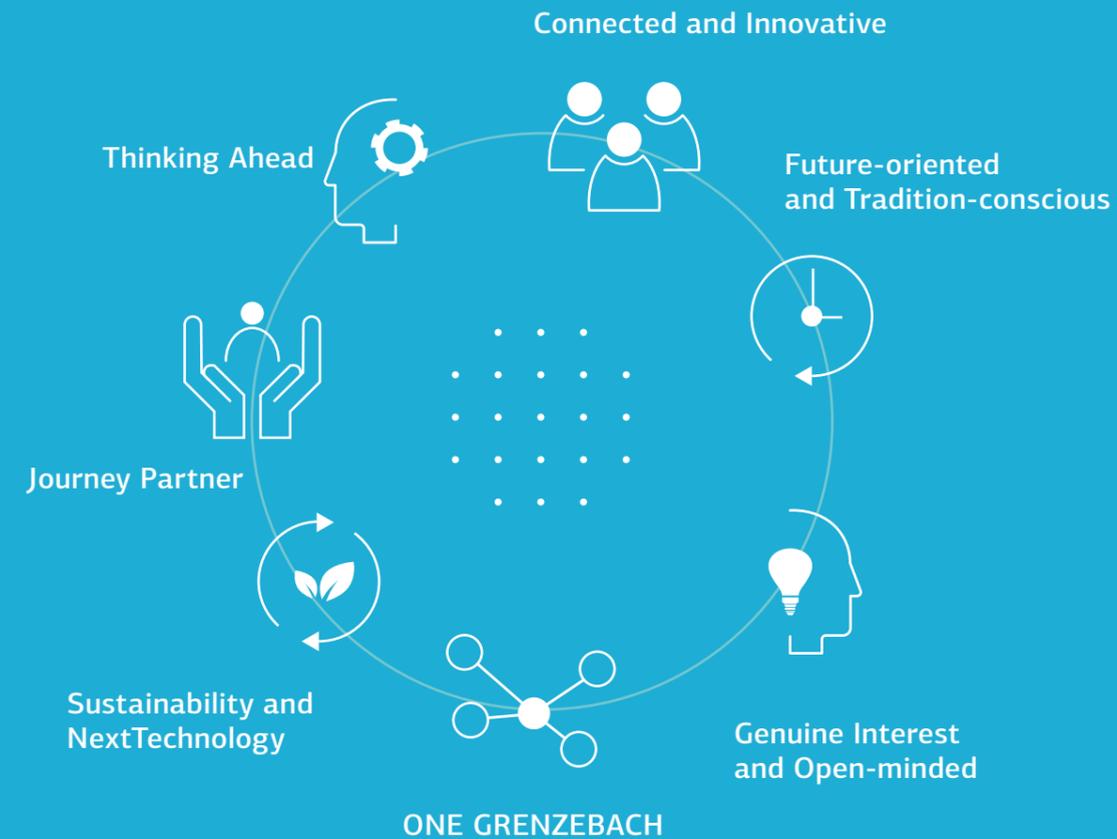
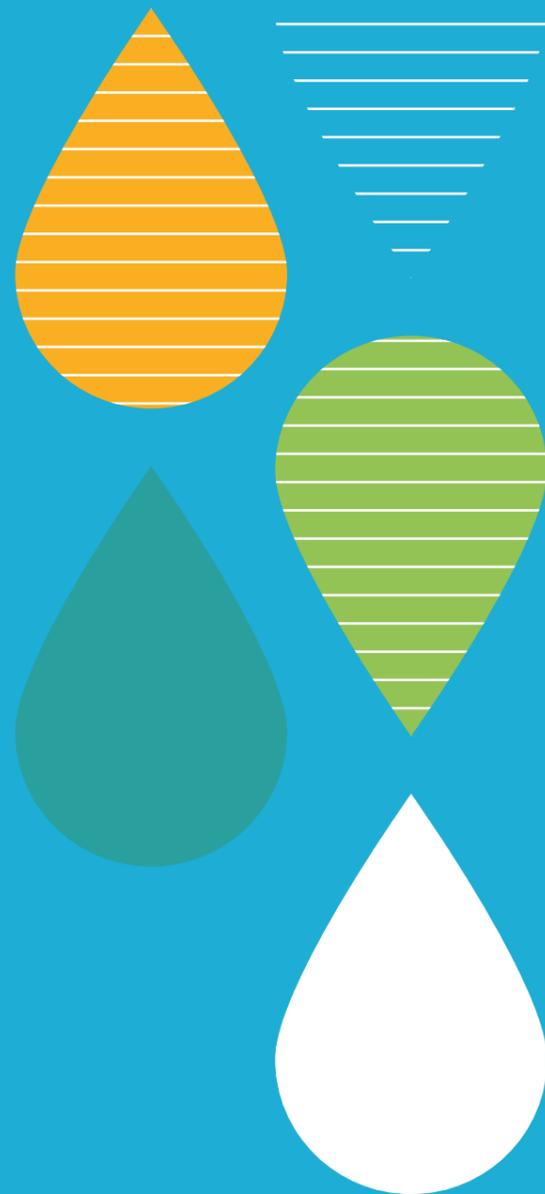
MILLION EUROS INVESTED

in research, development, and global infrastructure expansion
Transformation and research enable us to better meet customers' needs, to be more efficient, and to be ready for future trends.

In the reporting year, research and development was focused on energy-efficient, resource-saving, and digital solutions to optimize plant efficiency and keep the carbon footprint to a minimum.

In terms of infrastructure, the Casting division introduced automation solutions to safeguard quality standards and increase efficiency. Furthermore, the Group made international investments in facilities in Beachwood (USA), Pune (India), and Iasi (Romania) to increase production capacity and market flexibility.





NEXT STRATEGY

Next Stop: Future

The Grenzebach Group has developed a global concept in the form of NEXT, which brings together the strategies and plans for all sites, business units, and divisions for the coming years. NEXT is Grenzebach's timetable for achieving long-term success and making optimal use of resources. The strategy helps to define the company's focus, minimize risks, and seize opportunities, which ultimately contributes to sustainable growth and a secure future. The starting basis of the strategy is the vision for the Group to be a dependable and strategic journey partner and to create a bright future for all generations.

NEXT GRENZEBACH

Thinking Ahead for Productivity

Protectionism, nationalization, the emergence of new business ecosystems, and increasing government regulations are influencing world affairs. Recent years and forecasts indicate that only those who seize change as an opportunity, identify trends early on, remain curious, and align global and local conditions, can enjoy long-term success. With NEXT Grenzebach, we are making space for these opportunities.

Our Driving Forces—Moving Forward Together

Our driving forces are at the heart of the NEXT strategy. Entrepreneurial spirit, quick decision-making, innovation, and close collaboration with our partners and customers is what makes us strong. As a family-controlled company and a dependable journey partner to our customers, we place importance on flexibility and freedom of action in our decisions.

Our Targets—Clear and Motivating

We have clearly defined goals: We strive for excellence, maximum customer satisfaction, and we aim to stand out as an attractive employer. We cement and expand our market position by means of innovation and a strong community. Every contribution helps us achieve these targets, and we work toward them with an open mind, intuition, and dedication.

Our Areas of Focus—Viewed with an Open Mind

In addition to our targets, there are clearly formulated focus areas to help give our stakeholders some orientation.

NEXT LOCATIONS AND NEXT BUSINESS UNITS

A Powerful Presence in Customer Regions

With global business unit structures and our worldwide sites, we are always strategically close to our customers. The NEXT sites and NEXT business unit strategies enable us, as a globally operational Group, to respond effectively to the markets and customers in the regions where we locate our branches—so that they too can benefit from the synergy effects of the Grenzebach Group.

NEXT MANAGEMENT

Leading Responsibly

The Grenzebach Group is primarily the responsibility of Grenzebach Maschinenbau GmbH. The management of the Grenzebach Group is made up of three board members with different areas of responsibility: CEO Dr. Steven Althaus, CFO Steffen Kaiser, and COO Moritz Ückert. The sole shareholder of Grenzebach Maschinenbau GmbH is Codymag GmbH, where all activities and business investments are pooled together within the Grenzebach community.

GROUP-WIDE CENTRAL FUNCTIONS

In its capacity as the headquarters of the Grenzebach Group, Grenzebach Maschinenbau GmbH defines the strategic alignment of the Group and is responsible for group-wide acquisition activities. Its tasks include determining joint strategies and managing the companies with their targets in mind. As the parent company, Maschinenbau GmbH, sets the standards, provides infrastructure and guidelines to support transparency, corporate management, and compliance with legal provisions. By pooling together expertise and headquarter duties within Maschinenbau GmbH, it becomes

a multifaceted contact partner for the Group's wide-ranging interests. Maschinenbau GmbH is also tasked with providing support through group-wide services.

To be in the best possible position to guide and support the Grenzebach Group, Maschinenbau GmbH covers four different Corporate Functions. These include Legal & Compliance, Global Operations, Finance & Business Support, and Central Functions.

With its Guiding Principles, the Grenzebach Group controls the processes, behavior, and targets or roles of managers and employees in all companies within the Group. Furthermore, the procedures for all major business transactions are defined in each company's bylaws.



DR. STEVEN ALTHAUS



STEFFEN KAISER



MORITZ ÜCKERT

NEXT SUSTAINABILITY

From A Sense of Duty and Belief

Grenzebach firmly believes that sustainable economic activities and social responsibility are integral elements for a fair world worth living in. This requires a solid foundation. That is why the Group decided to follow pertinent sustainability standards, including:

- » the UN Sustainable Development Goals (SDGs),
- » the requirements of the ESRS,
- » the German Supply Chain Act (LkSG)/the CSDDD (from 2028/2029)

to improve contributions for sustainability and socially responsible business conduct.



Continuous Process

The pursuit of these standards is not a static promise, but a continuous process. The Group regularly reviews its performance and reports its activities transparently. With this ongoing self-assessment and self-improvement, Grenzebach is striving to identify best practices and opportunities for improvement while continuing to optimize its impact on the world around it.

“WE DON’T JUST SEE SUSTAINABILITY AS OUR DUTY, BUT RATHER AS AN OPPORTUNITY. THAT’S WHY WE AREN’T WAITING AROUND FOR DECISIONS TO BE MADE; INSTEAD, WE’RE BEING PROACTIVE IN MANY AREAS. FOR THIS REASON, WE HAVE DECIDED TO BEGIN REPORTING ANNUALLY ON OUR SUSTAINABILITY ENDEAVORS, STARTING FROM 2023—EVEN THOUGH WE FULLY REALIZE THAT, AS THE LAW CURRENTLY STANDS, WE WILL NOT BE REQUIRED TO DO SO UNTIL 2028.”

Dominik Schwarz
Sustainability Manager Grenzebach Group



Legal Standards, Transparency, and a Leading Role

We are witnessing increasing efforts to enshrine sustainability initiatives and sustainability reporting into law, both at a local and at a global level. For example, the EU is planning to merge many of the proclaimed framework conditions, such as sustainability reporting pursuant to ESRS, due diligence in the supply chain as per the CSDDD (Corporate Sustainability Due Diligence Directive), or the Carbon Border Adjustment Mechanism (CBAM), in a bid to reduce the level of bureaucracy. We welcome this development, though it does highlight the relevance and necessity of sustainability measures. At the same time, we perceive that these policies still need some clarification, and it will therefore be some time yet before these proposals become law.

We hope our proactive approach will allow us to keep adjusting our measures and always fulfill the applicable legal framework.

DIALOG WITH SOCIETY

Shared Commitment for a Better Future

Only through collective endeavors can we build a sustainable future for the current generation and generations to come. This is why Grenzebach is regularly in exchange with numerous different groups within society; some of which have very different perspectives and demands of the Group. The main stakeholders of the Grenzebach Group are

EMPLOYEES

CUSTOMERS

BUSINESS PARTNERS

SUPPLIERS

INVESTORS

FINANCE PARTNERS

SHAREHOLDERS

MEDIA REPRESENTATIVES

GENERAL PUBLIC

ENVIRONMENT

To bring about positive change, it takes teamwork—both within the Group of companies, and through engagement with stakeholders. Together, we can pool resources, find solutions, and overcome challenges.

An active interchange of ideas and feedback puts us in a position to be able to meet the needs and expectations of our interest groups. Through dialog and teamwork, Grenzebach is able to create a sense of trust, strengthen relationships, and promote a culture of shared success. The voices of stakeholders guide the Group in its strategic decision-making and help it to have a positive impact on its own corporate culture, the future, and the environment—in its immediate surroundings and beyond.

We Spell TEAMwork with a Capital TEAM

Our sustainable actions are rooted in close collaboration between all those involved. Open and honest communication and an exchange of knowledge lead us to creative ideas that pave the way to more environmentally friendly practices and innovative solutions. Every member of the team brings their own unique perspectives and skills, which enable us to develop effective and targeted strategies with which to reach our ecological and social goals.

For instance, our site in Bad Hersfeld established a channel, the IdeasFORUM, allowing employees to incorporate their ideas so that they can help to creatively shape the future of the Group. Every idea that is submitted is evaluated by a team comprised of colleagues from different areas of expertise, together with representatives from the executive board and works council.

Collaborating Beyond Department Borders

One important aspect of our strategy is interdisciplinary collaboration. We encourage our teams to interact beyond their own department walls, so that they might discover synergetic approaches. Whether it is a matter of energy efficiency, waste reduction, or social responsibility—teamwork is the key to identifying and successfully implementing sustainable solutions. This integrated approach helps us to develop a deeper understanding of the impact our decisions have, and to embed sustainable initiatives in every aspect of our Group.



“IN 2024, 22 SUGGESTIONS FOR IMPROVEMENT WERE SUBMITTED. OF THOSE, THREE IDEAS WERE IMPLEMENTED STRAIGHT AWAY.”

Wolfgang Weisel
Chairperson of the IdeasFORUM Bad Hersfeld



“2024 SAW THE CREATION OF A GROUP THAT CAME TO BE KNOWN AS THE ‘AI ASSOCIATION’ AT OUR SITE IN HAMLAR, COMPRISED OF COLLEAGUES FROM DIFFERENT DEPARTMENTS. IT WAS IMPRESSIVE TO SEE JUST HOW OPENLY AND PASSIONATELY THEY ALL CONTRIBUTED THEIR IDEAS FOR ADVANCING AI IN THE GROUP. TOGETHER, WE ASKED OUR COLLEAGUES ABOUT VARIOUS IMPORTANT TOPICS—INCLUDING DOCUMENT MANAGEMENT—AND PASSED ON THE RESULTS TO THE CORPORATE DEPARTMENTS FOR FURTHER CONSIDERATION. THIS GROUP WAS A GREAT EXAMPLE OF THE DIFFERENCE THAT TEAMWORK CAN MAKE.”

Tanja Sedelmaier
Head of Lifecycle Management Hamlar

Involving the Community and External Partners

Our duty to sustainability extends far beyond our Group alone. We cooperate with local communities, research institutes, and other companies to share our experiences and our resources. These partnerships enable us to promote collective responsibility and work together on projects that are not only ecologically responsible, but socially responsible too. Against this background, teamwork helps us to make measurable advances and bring about real change. This social engagement is part of our strategic direction which is aimed at sustainable development, cooperative exchange, and the promotion of innovation. Therefore, we are open to feedback from these cooperations, so that we can grow and improve.

In the reporting year, we worked closely with the Initiative for the Ludwig Erhard Prize e. V. (ILEP) to have our sustainability measures evaluated externally.

Their findings and the resulting “Recognized for Sustainability – EXCELLENCE” award underline our proficiency in sustainability:



Innovative and Sustainable Mindset

Our longstanding tradition as an innovative, family-owned Group is a decisive catalyst for our ongoing endeavors concerning sustainability.

Taking Responsibility

We follow the principles of the UN Global Compact and the Sustainable Development Goals, which raises our awareness of our own responsibility to society.

Open Communication with Stakeholders

By taking a proactive approach to communication and acting as a role model to customers and partners, we gain trust and encourage collaboration.

Transparency via SERICY

Introducing our integrated digitalization platform SERICY offers extensive insights into our processes and allows for decisions to be supported by data.

Integrating Environmental, Social and Governance (ESG) Considerations into our Strategies

Virtually all ESG topics are integrated into our functional strategies, which form the basis for sustainable business practices.

Systematic Management of Measures

We have implemented an effective system that enables us to proactively monitor and evaluate our progress in relation to sustainability.

Verifiable Impacts

Initiatives such as phosphorus recycling and energy savings within our processes show how we are actively contributing to the circular economy.

Future-Oriented Adoption of ESG

The willingness to adopt ESG principles as a central element of our business model protects our future viability and our competitive edge.



These strengths put Grenzebach in an optimum position to be seen as a trailblazer in the sustainable development of industrial automation, not only today but also in the future. We will keep taking responsibility and developing innovative solutions that have a positive impact on the environment and on society.

Parallel to this, the evaluation by ILEP illustrated the valuable potential for Grenzebach to further enhance its role as a responsible and conscientious corporate citizen. ILEP recommends taking an active part in social discourse as evidence of our social responsibility.

To optimize the effectiveness of ESG principles within our supply chain, we are expanding our influence as a role model. A defined decision-making mechanism will align the Group's financial targets with the ESG targets to highlight the relevance of ESG principles in our Group strategy.

ILEP also recommends making a clear distinction in the process portal between process performance KPIs and effect KPIs for even more efficiency and transparency. It is also important to gather direct feedback from stakeholders, including customers and suppliers, rather than just working through representative groups.

A structured approach to gathering innovative ideas—coupled with a culture of recognition and appreciation—will further boost our innovative prowess and help us to develop sustainable solutions for the future.



“WE HAVE DESIGNED OUR SUSTAINABILITY REPORT TO BE MORE THAN MERELY A MANAGEMENT TOOL; INSTEAD, WE WANT IT TO CLEARLY AND TRANSPARENTLY SHOW OUR RELEVANT INTEREST GROUPS THE IMPACT OUR SUSTAINABILITY MEASURES HAVE HAD. THIS WAY, WE CAN

ENCOURAGE OPEN DIALOG AND FURTHER DEEPEN THE TRUST OUR STAKEHOLDERS PLACE IN US.“

Ralf Jäger
SVP Operation and Sustainability Grenzebach Group

Training and Education to Inspire All

Education and inspiration are the key to achieving our sustainability targets. This is why we are involved in training programs and workshops that raise awareness of sustainable practices, while also strengthening team spirit. Through shared learning opportunities, we create an environment where everyone has the chance to take part and to learn from others' experiences.

“IN 2024, 15 TRAINEES SUCCESSFULLY COMPLETED THEIR APPRENTICESHIP, AND WE ARE DELIGHTED THAT MORE THAN 85 % OF OUR GRADUATES HAVE TAKEN ON A PERMANENT POSITION IN THE COMPANY.”

Sonja Mayr
Training Officer Hamlar



THE KEY TO SUCCESS

Impacts on Economy, Environment, and Society

The Grenzebach Group's solutions and services contribute to economic growth, technological advancement, and improved working conditions among its customers and suppliers. As such, the Group views itself as a journey partner to its customers and as a socially responsible employer to its employees and their families.

The Group takes its responsibility seriously and is also aware of any ill effects that its own actions may have on the economy, the environment and society, as well as on the company and its employees.

CORE SUSTAINABILITY TOPICS

This is why Grenzebach identified core sustainability topics that cover social or civil, ecological, and economic considerations and that are relevant to its sectors, its interest groups, and to the Group itself. As part of this, we considered the demands placed on the Group, both internally and externally.

Grenzebach regularly and systematically conducts a double materiality assessment to identify the sustainability issues most important to it. These assessments also take into account the requirements of the ESRS. The issues identified cover several focus areas, which fall under the three pillars of sustainability and present diverse impacts. Parallel to this, we are continuing to monitor the final pending legal requirements for the double materiality assessment, especially regarding the number of data points required and other relevant criteria so that our analysis is always legally compliant and future-proof.

NEXT SUSTAINABILITY STRATEGY

Joy and Responsibility in Harmony

For more than 60 years, the Grenzebach Group has been committed to innovation, sustainability, and dialog with its interest groups. This is why Grenzebach views financial success as harmonious with sustainability targets, as well as corporate targets for price, quality, and innovation.

We responsibly use our economic opportunities for action, in alignment with our customers' targets, society and the available resources. We maintain this environmental, market, and customer focus through teamwork and an in-depth understanding of state-of-the-art technologies.

A Strategy that is Already Thinking of Tomorrow Today

Various opportunities arise during times of fundamental change, but these call for an unsurpassed level of collaboration, the very highest quality standards, as well as clear processes and strategies.

Within the NEXT sustainability strategy, Grenzebach has cemented its timetable in writing. The strategy blends seamlessly with the Grenzebach Group's overall strategy.

Our Vision—Clear and Encouraging

The Grenzebach Group is a successful and international automation specialist. As a reliable journey partner to our customers, our solutions and services promote sustainable and resource-conserving processes and an environmentally friendly and responsible change—both internally and externally.

Our Mission—To Think Ahead

By applying cutting-edge technologies and artificial intelligence (AI) and continuously improving our processes, solutions, and services, we are endeavoring to keep our own environmental impact—and that of our customers—as low as possible. In this regard, we are committed to ethical conduct and sustainable business practices to fulfill the requirements of our customers and their end users, and, thereby, make a positive contribution to the global community, climate protection, and the environment. Together, we are creating a sustainable world, where technological advancement and ecological and social responsibility exist in perfect harmony.

Our Targets—Sustainable and Binding

When looking at our sustainability targets, our ecological responsibility in particular plays a central role in leaving a positive impact on the environment and in fulfilling our ambitions as a socially responsible corporate group.

These strategic targets reflect our efforts to assume responsibility in our capacity as a dependable journey partner for our stakeholders as well as industry pioneers, and to leave a positive impact on the environment and society.

Our Route—Clear and Targeted

Whether promoting the circular economy, switching to renewable energies, or reducing CO2 emissions—our route to the future follows a clear strategic path of robust processes and binding targets that impacts on our own footprint as well as the footprint of our customers and other stakeholders.

To achieve our sustainability targets, we have developed a variety of concrete plans and projects—many of which we have already put into practice. These include investing in renewable energy, implementing innovative technologies to conserve resources, and working together with research institutes to effect positive changes on a global level. All the while, Grenzebach accompanies its customers and partners from the very start of the journey and doesn't shy away, even when it feels like swimming against the current.

By



2025

Suppliers meet defined sustainability criteria

2030

Reduce scope 1 & 2 CO2 emissions by >95 %
Increase circular economy by 20 %

2035

Lower material consumption by 15 %

2040

Reduce scope 3 CO2 emissions by >50 %

2050

Constantly increasing energy efficiency by >3 %

INTEGRATED SUSTAINABILITY IN DAILY LIFE

We Care—24/7/365

The Grenzebach Group adopts group-wide measures to continuously improve its sustainability performance, for example in energy and environmental management, and to hit its sustainability targets in line with its strategy. These measures are reflected in our shared values and are guided by a process of continuous improvement.

Management Systems with Added Value

All measures, processes, and strategies in the field of sustainability management are indispensable elements of the Grenzebach Group's corporate strategy. In our efforts to achieve the highest standards of sustainability and consistently optimize our practices, we adhere to key ISO standards as a decisive tool. Not only do these ISO standards form part of our sustainability strategy, but they also enable us to consistently focus on our targets across all of our sites. Our integrated management system (IMS) incorporates:

- » Quality management system pursuant to DIN EN ISO 9001
- » Environmental management system pursuant to DIN EN ISO 14001
- » Energy management system pursuant to DIN EN ISO 50001
- » Occupational health and safety management system pursuant to DIN EN ISO 45001
- » Information security management system, based on ISO IEC 27001

Using these standards as a basis, we are able to create an independent and transparent platform to assess and certify our progress.

All interested stakeholders are welcome to view the information in the annex to find out more about our ISO systems, measures, and why they matter for our sustainability targets.

„BASED ON 18 INTERNAL AUDITS WITH AN AVERAGE PROCESS PERFORMANCE OF 79 %, WE WERE ABLE TO IDENTIFY SPECIFIC POTENTIALS FOR IMPROVEMENT AND IMPLEMENT TARGETED IMPROVEMENTS. WE CONSIDER THESE AUDITS TO BE A STRATEGIC INSTRUMENT THAT ENABLES US TO KEEP IMPROVING THE PRODUCTIVITY OF OUR PROCESSES AND TO MEET THE REQUIREMENTS OF OUR INTEGRATED MANAGEMENT SYSTEMS AROUND THE WORLD. IN THE MECHANICAL ENGINEERING DIVISION, FOR INSTANCE, ONE SUCH AUDIT IDENTIFIED A CRITICAL GAP IN THE ASSESSMENT PROCESS FOR QUALITY INSPECTION. AS A RESULT, A WORK INSTRUCTION WAS WRITTEN THAT TODAY UNDERPINS A GLOBALLY CONSISTENT AND QUALITY-ASSURED PROCESS—ESSENTIAL TO ENSURING OUR STANDARDS ARE MET.“

Caleb Alexander
Global Continuous Improvement Manager Grenzebach Group



It's a YES from Us—The Many Faces of Responsibility and Sustainability

The Grenzebach Group uses binding internal declarations to make sure the Group and its employees and suppliers act responsibly and ethically and follow the rules that the Group sets for itself. The declarations are based on fundamental ethical values and are designed to uphold the beGrenzebach ethos as well as commercial values. This way, the Group establishes a level of obligation and certainty for its customers, its employees, and itself.

Code of Conduct

The Code of Conduct contains binding values, perspectives, rules, and measures that serve as a guide and are also actively embodied in the Group. The established principles and values are binding for all employees at all sites and in all divisions around the world. The Group expects its suppliers and business partners to respect the Grenzebach corporate philosophy, to adhere to the standards and guidelines of the code, to demonstrate zero tolerance toward violations of the code, and to advocate for compliance with the requirements, including by their respective business partners and throughout the supply chain.

Policy Statement

In its policy statement, the Grenzebach Group vows to have ecologically and socially responsible corporate management. The values, perspectives, rules, and measures prescribed in this declaration are actively embodied within the Group and are binding for all employees and all divisions around the world. The Group thereby aligns itself with internationally applicable policies, as well as the principles of the UN Global Compact (focusing in particular on SDGs 4, 8, 12, and 13). Grenzebach expects the same conduct from all its suppliers—whether direct or indirect. The Group's expectations concerning socially and environmentally responsible conduct are communicated through contracts, training courses, and audits. In doing so, the Grenzebach Group maintains due diligence.



Sustainable thought and action permeate every level. To fulfill the measures and reach its sustainability targets, the Grenzebach Group has defined certain duties and responsibilities within the organization.



RESPONSIBILITY IN ALL ITS FACETS

Ecological. Social. Economic.

Sustainability is an ongoing and multifaceted process: from forward-thinking resource usage and the use of eco-friendly materials and products through to supporting health and safety in the workplace

In practice, this means that Grenzebach

- » uses resources efficiently,
- » uses energy wisely,
- » reduces its environmental impact around the world,
- » actively contributes to environmental protection and occupational safety,
- » and maintains sustainable supply chains.

The Grenzebach Group is particularly focused on the following areas of action, each supplemented by the most important considerations that have been identified in the double materiality assessment.

Sustainable Corporate Management

- » Corruption prevention and avoidance
- » Establishing complete transparency
- » Strengthening operational and strategic management

Products

- » Offering innovative and premium products and services
- » Improving the resource efficiency of the products
- » Promoting a collaborative partnership with customers

Environment

- » Developing efficient use of resources
- » Reducing energy consumption
- » Minimizing environmental impact

Employees

- » Promoting occupational safety
- » Strengthening product and service responsibility
- » Laying the foundations for professional and personal successes

Supply Chain

- » Expanding the reporting system for compliance with laws and environmental and social standards
- » Lowering material consumption
- » Expanding knowledge

FACTS AND FIGURES

Spotlight on the Sites

Site	Energy (kw/h)	PV (kw/h)	Gas (kw/h)	Water (m ³)	Non-Hazardous Waste (metric tons)	Hazardous Waste (metric tons)
Grenzebach Group. global						
2022	115.09	228.24	107.25	2.91	100.90	29.60
2023	124.22	209.61	77.55	2.43	139.16	25.80
2024	118.95	256.61	167.50	2.75	141.93	31.28
Hamilar. Germany						
2022	96.31	158.54	198.67	1.99	96.19	20.33
2023	93.81	160.54	109.20	1.96	168.31	21.47
2024	94.91	182.39	214.07	1.81	231.67	43.01
Bad Hersfeld. Germany						
2022	96.67	558.99	42.47	2.62	52.96	0.22
2023	77.61	397.07	37.82	0.98	43.85	0.07
2024	82.76	428.06	46.40	1.39	54.70	0.59
Newnan. USA						
2022	123.25	0.00	93.31	1.18	33.53	0.74
2023	114.18	0.00	78.39	1.21	79.71	0.31
2024	83.88	0.00	56.38	0.60	79.45	0.24
Jiashan. China						
2022	149.84	270.85	0.00	4.05	5.71	56.06
2023	143.78	285.76	0.00	3.87	7.76	50.23
2024	159.69	508.35	177.14	4.21	10.20	66.37
Iasi. Romania						
2022	680.73	0.00	658.37	11.10	1.795.62	145.02
2023	589.21	1.724.84	614.81	10.23	1.750.01	149.95
2024	410.94	1.767.28	993.15	11.76	1.103.50	40.70
Pune. India						
2022	0.00	0.00	0.00	0.00	0.00	0.00
2023	0.00	0.00	0.00	0.00	0.00	0.00
2024	132.55	0.00	0.00	66.42	0.00	0.00

Note: The table provides details of the normalized consumption by the Grenzebach Group, as well as the main production and development sites in the years 2022, 2023, and 2024 in terms of energy, photovoltaic energy, gas, water, and waste (rounded to two decimal points). The values are derived from the base value, which is divided by the normalization parameter VAU (Value Added Unit).

SUSTAINABLE CORPORATE MANAGEMENT BUILDS TRUST

Clear. Straightforward. On Equal Terms.

Grenzebach is committed to sustainable corporate management built upon transparency, responsibility, and long-term value creation. Effective risk management is also part of our corporate management, along with working toward greater employee satisfaction. By taking responsibility for the impact our activities have on the environment, society, and economy, we are able to earn the trust of others. This is an important factor for the company's overall success, not to mention an integral element for our relationships with all stakeholders.

We Do Not Tolerate Corruption of Any Kind

The Grenzebach Group stands for responsibility and integrity. Our employees and authorized representatives send out a clear signal against corruption to prevent even the slightest appearance of it. Whether working in industrial or administrative divisions—our employees complete regular online and/or in-person training courses on the subject of anti-corruption to develop a common understanding of our principles. It is important to us that all activities are undertaken in compliance with German and international anti-corruption laws, as well as our own company policies.

Furthermore, we reject any form of collaboration that could potentially facilitate corruption. Gifts, invitations, or hospitality must not overstep pre-defined limits and must be proportionate. Strict rules for donations are essential: These must not influence any business decisions, especially not in relation to government officials. Our anti-corruption rules apply the world over and are therefore observed in all our international branches.

It is vital that personal and business interests are kept separate. Upon joining the Grenzebach Group, every employee consents to the Group's generally applicable compliance rules. Transactions and business affairs are documented openly and transparently in the interest of traceability.

We Establish Full Transparency

The Grenzebach Group firmly believes in the principles of fair competition, free-market economy, and responsible employee management. Our interactions with employees, business partners, and third parties are neutral and respectful. We maintain a courteous relationship with our customers, employees, suppliers and competitors, because we believe in the power of open dialog. This also includes regular integrity checks conducted on commission recipients, to ascertain whether the company in question and authorized recipients are on any blacklists.

Year	Compliance Inquiries	Individual Checks			Project Protection Agreements
		Personen	Firmen	Treffer	
2024	6	14	8	0	5
2023	11	20	17	0	8
2022	19	30	24	1	14
2021	11	22	17	0	8
2020	26	69	75	0	11

If a company fails our checks, we will not enter into any contracts with the company in question and no business relationship will be formed.

In 2024, we carried out our annual supplier audits once again. Regularly reviewing the supplier's performance helps us to maximize efficiency within the supply chain, minimize risks, and safeguard the quality of the end products. Between January and December, we evaluated a total of 17 suppliers across the Group, four of them in Hammlar, Germany (2023: 12). The average performance of the parties audited by Hammlar was 3.75 points (2023: 3.08).

The interactions with our stakeholders follow the Grenzebach Group's Code of Conduct and are always fair and transparent. All information that we communicate is complete, factually correct, and clearly traceable. We do not make unreasonable value judgments, and we endeavor to make honest, truthful statements. We firmly believe that this is the only way to lay strong foundations for a trusting and transparent working relationship.

In 2024, we introduced a whistleblower system, giving everyone the opportunity to report breaches of our Code of Conduct or other standards in confidence. Not only does this system help to prevent misconduct, it actually promotes a culture of transparency and responsibility within our Group. By creating a safe space for making reports, we strengthen the trust our employees and partners have in us and encourage them to take an active part in upholding our ethical standards.



“THE WHISTLEBLOWER SYSTEM IS DESIGNED TO DETECT AND ADDRESS POTENTIAL RISKS AT AN EARLY STAGE TO SUPPORT OUR SUSTAINABILITY TARGETS. BY GIVING A VOICE TO THOSE WHO ARE ACTIVELY ENGAGED WITH OUR PROCESSES AND PRACTICES ON A DAILY BASIS, WE ARE PROMOTING A CULTURE OF OPENNESS AND CONTINUOUS IMPROVEMENT.”

Hannah Kneip
Legal & Compliance Manager Grenzebach Group



“WE TAKE THE PERFORMANCE OF SUPPLIERS SERIOUSLY IN OUR AUDITS. IF THE ASSESSED PERFORMANCE DOES NOT MEET WITH EXPECTATIONS, WE WORK TOGETHER TO FIND SOLUTIONS TO IMPROVE. THIS SEES THE GLOBAL QUALITY TEAM WORKING CLOSELY WITH COLLEAGUES FROM PURCHASING.”

Caleb Alexander
Global Continuous Improvement Manager Grenzebach Group

We are Strengthening our Operational and Strategic Management.

Strengthening our operational and strategic management is vital to the competitive edge and sustainability of our globally operational group of companies. Strong management results in cohesion, agility, and consistency within the strategic alignment of all sites, which ultimately enhances trust among all interest groups. Furthermore, by closely interlinking operational and strategic processes, we are able to capitalize on synergy effects and optimized processes, which, in turn, leads to cost savings and efficiency gains.

This was the reason behind the “Operational Excellence” initiative launched last year. It scrutinizes operational and strategic processes with the aim of significantly increasing the Group’s efficiency and profitability. The initiative is intended to establish an organization that wishes to keep improving and producing concrete results. These results have a positive effect on customers, partners, and suppliers, for example in the form of quality increases or shorter production times. Since the fundamental principles of industrial production apply to all planning and production divisions, our solutions are of a consistently high quality and are delivered in a timely fashion.

The project operates under ten clearly structured work packages and promotes teamwork within the Group. The packages deal with the following topics:

Lean Industrial Engineering

Accurate Supply Chain

Reducing Stock and WIP, Material Flow, and Logistics

Costs

Engineering Change Management Process

Multi-Project Management

Data Quality and Management by KPIs

Rollout of Lean Basic Production

Value Stream Mapping and Production Cycle and Takt

Principles

International Knowledge and Skills Management

Negotiation

One team member or one group is responsible for each step, which establishes transparency and a sense of responsibility. This structure allows for a more precise allocation of resources and simpler progress monitoring, which ultimately leads to jobs being processed faster and more efficiently.

Only through the close collaboration of all employees can the project reach its full potential.

The customers benefit not only from higher product quality and faster delivery times, but also from a business partner and journey companion who acts sustainably and places their specific requirements front and center. These joint endeavors highlight the Grenzebach Group’s commitment to always exceed customer expectations and offer sustainable value creation.



BY REMODELING THE MATERIAL FLOW PROCESS ACCORDING TO THE PULL PRINCIPLE, WE WERE ABLE TO INCREASE EFFICIENCY. THIS ENABLES US TO RESPOND TO ORDERS MORE QUICKLY.“

Frank Wenger
Global Quality Manager Grenzebach Group



“IMPLEMENTING THE 6S METHOD WITHIN OUR PRODUCTION MADE A HUGE DIFFERENCE IN OPTIMIZING OUR WORKFLOW. THIS INITIATIVE ENABLED US TO IMPROVE WORKPLACE ORGANIZATION AND INCREASE SAFETY, AS EVIDENCED BY A 30 % REDUCTION IN ACCIDENTS. WE ALSO SUCCEEDED IN CUTTING THROUGHPUT TIMES BY 25 % AND INCREASING THE EFFICIENCY OF OUR PROCESSES BY AN IMPRESSIVE 18 %. THESE IMPROVEMENTS ENABLE US TO BOOST OUR PRODUCTIVITY WHILE SIMULTANEOUSLY PROTECTING THE QUALITY OF OUR PRODUCTS.“

Raclaru Catalin
Quality Team Leader Iasi



“THE TARGETED IDENTIFICATION AND REDUCTION OF UNUSED STOCK ALLOWED US TO REDUCE THE VOLUME OF FREE STOCK AT OUR SITE IN CHINA BY AROUND 25 % BETWEEN JANUARY AND DECEMBER 2024. THIS ENABLED US TO USE AVAILABLE STOCK MORE EFFICIENTLY AND SIGNIFICANTLY IMPROVE THE OVERALL PROFITABILITY OF OUR WAREHOUSING.“

Ye Zheng
Senior Logistics Manager & IMS Management Representative Jiashan



“UP UNTIL NOW, WE WERE ASSEMBLING THE L1200S AUTOMATED GUIDED VEHICLE IN A MAKE-TO-STOCK PRODUCTION FACILITY AT OUR SITE IN HAMLAR, WHICH LED TO HIGH THROUGHPUT TIMES. ALL 22 SUB-ASSEMBLIES PER VEHICLE WERE MANUFACTURED IN ADVANCE BEFORE FINAL ASSEMBLY BEGAN, WHICH MEANT LARGE STOCKPILES AND LONG LEAD TIMES. OUR NEW TARGET IS AN ASSEMBLY LINE PRODUCTION WITH AN OUTPUT OF ONE VEHICLE PER DAY. AT PRESENT, IT TAKES US ABOUT 45 PRODUCTION HOURS PER VEHICLE, AND WE ARE AIMING TO REDUCE THIS TO 33 HOURS. THIS APPROACH AFFORDS US FAR MORE FLEXIBILITY, ENABLING US TO REACT TO CUSTOMER REQUESTS FASTER AND IN A MORE TARGETED MANNER.“

Ottmar Waninger
Team Lead AGV Montage Hamlar



“TEAMWORK IS FUNDAMENTAL TO OPERATIONAL EXCELLENCE, OVERCOMING THE CHALLENGES OF THE PRESENT DAY AND SUPPORTING SUSTAINABLE SUCCESS.“

Moritz Ückert
COO Grenzebach Group
Global Project Manager for Operational Excellence

INNOVATION THAT EMBODIES ECONOMIC SUSTAINABILITY

Long-Lasting. Secure. Dependable.

Equipped with Grenzebach's high-performance technologies, customers routinely hit their targets and are well prepared for future developments. Our innovative solutions keep our customers' production running smoothly. What's more, it enables them to concentrate on what matters most: their own customer's wishes and market development.

We Provide Innovative and Exceptional Solutions and Services.

In terms of ecological responsibility and sustainable growth, Grenzebach is continuously developing innovative solutions and exceptional services that meet modern-day requirements. We set new benchmarks with our state-of-the-art technologies and in-depth understanding of market requirements. Our goal is to offer our customers first-class solutions and to actively support them in reaching their own sustainability targets, that is why we place such importance on listening, talking, and collaborating.

One example of the importance of listening can be found in China: in the 2000s, the Chinese government launched an initiative to promote renewable energies and solar energy. This saw the demand for solar glass increase, so much so that glass manufacturers reacted by expanding their production capacities. Owing to our decades of experience and extensive know-how from the flat glass segment coupled with the direct proximity to the market with our facility in Jiashan, China, we have successfully developed effective and sustainable solutions for the cold end of textured glass production. Since then, demand for solar glass has continued to grow, not just in China, but around the world.



“WE LISTENED TO THE MARKET AND LEARNED FROM OUR EXPERIENCES. IN 2020, THE GRENZEBACH GROUP EXTENSIVELY OVERHAULED ITS PORTFOLIO OF SYSTEMS FOR TEXTURED GLASS. NEW TECHNOLOGIES HAVE ELEVATED THE PRODUCTION LINE TO A STATE-OF-THE-ART LEVEL, WHICH ALSO IMPRESSES IN TERMS OF

ATTRACTIVE PRICING, FAST PRODUCTION SPEEDS, AND QUICK COMMISSIONING. 2024 PROVIDED THE ULTIMATE EVIDENCE OF SUCCESSFUL MARKET AND CUSTOMER ORIENTATION: IN JUST UNDER FOUR YEARS, WE HAD SOLD 280 SOLAR GLASS LINES.“

James Shang
CEO Grenzebach Jiashan

This success is down to the brilliant teamwork between our sites in Germany and China. By working closely together to share our knowledge and experience, we were able to develop innovative solutions that work efficiently and economically, while still fulfilling the highest quality requirements. In this regard, our technologies support productivity as well as sustainability, because they actively contribute to the promotion of solar energy and therefore effectively support the global energy revolution.

The Grenzebach Group is continuously implementing measures to improve customer focus. This is why the Group expanded its portfolio this past year to include its own special hammer mill with air classifier. This key technology is central to the calcination process that draws crystal water out of gypsum. With this hammer mill and the dynamic air classifier, we bring our customers consistently high product quality, which is indispensable for the manufacture of first-rate gypsum products.



“THE SPECIAL HAMMER MILL CAN PROCESS STONE SIZES OF BETWEEN 0 AND 50 MM WITH 100 PERCENT WET FGD GYPSUM, 100 PERCENT PRE-CRUSHED NATURAL GYPSUM, AND ANY MIXTURE OF THE TWO MATERIALS. WITH AN OUTPUT OF 60 METRIC TONS PER HOUR, THE HAMMER MILL MAKES IT POSSIBLE TO QUICKLY AND EFFICIENTLY GRIND, DRY, AND CALCINATE IN A SINGLE STEP.“

Sebastian Schuch
Sales Manager Building Materials

Grenzebach is planning to keep developing its technologies further, so that customers may benefit not only from significantly greater efficiency levels, but also from much lower energy consumption and CO2 emissions. The regular feedback and close collaboration with our customers enable us to meet the growing demands placed on quality and sustainability through our solutions and thereby make a valuable contribution toward an environmentally friendly gypsum industry.

The ultra-high-efficiency dryer (or UHE dryer for short), which is used for the manufacture of gypsum plasterboard and gypsum wallboard, gives an insight into what these developments might look like. In comparison with the best dryers currently available, the UHE dryer cuts energy usage by up to 33 %. This is due to the sophisticated interplay between the high- and low-temperature sections and the transition section. The low-temperature section uses 100 % waste heat, which can be as much as 400 kcal/kg. Furthermore, the UHE dryer reclaims between 45 and 50 % water and is compatible with renewable energies and low-calorie heat sources, the first of its kind on the market. This efficiency enables our customers to save money and helps them to implement more sustainable production processes.

By launching the integrated digitalization platform SERICY.GBS, Grenzebach is setting new standards in the digital processing world of glass production. Unlike previous control and optimization systems, SERICY.GBS now connects individual production processes along the entire value chain. This means that information from the production process is continuously collected, centrally stored, analyzed, and made available. All this makes SERICY.GBS a core element of the production plant.



“SERICY.GBS IS PART OF GRENZEBACH'S SERICY DIGITAL ECOSYSTEM AND PROVIDES A COMPREHENSIVE PACKAGE OF HARDWARE, SYSTEM ARCHITECTURE, DATA INFRASTRUCTURE AND APPLICATION SOLUTIONS THAT ARE SPECIFICALLY DESIGNED TO MEET THE NEEDS OF GLASS MANUFACTURERS.“

Peter Seidl
Head of Product Management Glass

SERICY.GBS provides interfaces to any subordinate or superordinate system as well as a simple and effective start to digitalizing glass production. Due to its high degree of compatibility, the platform is suitable for both new and existing systems and its scalability means that it can optimally adapt to future requirements.

The modular setup of SERICY.GBS enables glass manufacturers to choose from a variety of applications to suit their own specific requirements, for example:



We Are Continuously Improving the Efficiency of Our Solutions in Terms of Resource Consumption.

Through innovative technologies and continuous process optimization, we are actively committing to making our solutions more efficient in terms of resources. The aim is to promote environmentally responsible production methods that not only reduce our ecological footprint but also help our customers to achieve their own sustainability targets.

Grenzebach pursues the target of sustainably increasing the resource efficiency of glass production through technological innovations and continuous process optimizations. A particular focus of this is placed on what is known as the “hot end” of the production process—one of the most energy-intensive aspects of glass manufacture. One important lever in the bid to make glass production more energy-efficient lies in the exploration and integration of alternative, low-CO2 energy sources, and in the reduction of heat loss and the recovery of usable process heat.

At the hot end, Grenzebach takes care of the central process steps, such as the tin bath, the dross box, and the annealing Lehr. A tangible result of our development work in this area is the newly developed annealing Lehr. This allows for the cooling capacity to be adapted precisely to the specific requirements of the production process. Using adjustable fans and optimized cooling units significantly reduces the energy demand—representing a direct contribution to lowering CO2 emissions.



“DEPENDING ON THE COOLING CONFIGURATION, THE LOWER ENERGY CONSUMPTION ENABLES GLASS MANUFACTURERS TO CUT CO2 EMISSIONS BY BETWEEN 50 AND 70 %.”

Markus Michels
Sales Manager Glass

In addition to this, the system’s improved insulation minimizes heat loss. The low-steel design contributes to a lower carbon footprint during the production of the annealing Lehr. Alongside technological measures, Grenzebach is committed to collaboration and knowledge transfer within the industry. We are working together with our customers and industry representatives, to develop customized concepts that harness this potential and lower the energy demand in the production process over the long term. This is how the optimized annealing Lehr came to be installed in the research and development line of Glass Futures—a not-for-profit organization dedicated to making the glass industry carbon-neutral. As an active member,

Grenzebach is performing its own measurements and developments there to create practical solutions for resource-conserving glass production.

“OUR COMMITMENT TO ENERGY-SAVING DESIGNS, DIGITAL TECHNOLOGIES, ADVANCED CONTROLS, AND PROCESS MONITORING NOT ONLY ENHANCES GLASS QUALITY, BUT ALSO FOSTERS ENERGY EFFICIENCY AND OPERATIONAL EXCELLENCE.”

Markus Michels
Sales Manager Glass

By steadfastly developing components, such as the annealing Lehr and the dross box, alongside in-depth discussions with customers and partners, Grenzebach is contributing to reducing energy consumption, emissions, and raw material consumption—and with it a contribution toward the sustainable transformation of the glass industry.

We Promote Collaborative Partnerships with our Customers.

At the Grenzebach Group, we consider collaborative partnerships with our customers as a key to our shared success. We place great importance on close collaboration with our customers, as it enables us to understand their specific needs and offer them tailor-made solutions.

One example of this is the rebuilding of a dryer plant at the premises of one of our longstanding customers. After a major fire in our customer’s production facility, action was needed fast to repair the damaged veneer dryer and to expand a high-performance stacking line with state-of-the-art scanner technology. Due to the close teamwork and flexibility demonstrated by our colleagues, we were able to deliver a customized, integrated complete line on the existing footprint, all within just 16 months. The new Grenzebach veneer scanner detects with precision and categorizes the veneer into the corresponding quality based on customer specifications, which dramatically reduces the rate of rejects in downstream production steps, while also increasing the end product quality.



“THE SIX-STAGE DRYING CONVEYOR CAN DRY AND PROCESS DIFFERENT FORMATS OF WOOD VENEER. THE STAINLESS STEEL TRANSPORT BELTS MAKE IT POSSIBLE TO DRY BEECH, KNOWN FOR BEING A CHALLENGING TIMBER, AND PREVENT DOWNTIME CAUSED BY DRYER BLOCKAGES.”

Maximilian Hanf
Sales Manager Building Materials

This environmentally friendly solution increases flexibility and efficiency, actively enabling our customers to achieve their sustainability targets and strengthening their market position in the hardwood veneer sector.

The following example from a customer in the automotive sector demonstrates how a shared commitment can overcome challenges with transformational results.

As part of its move to digitalize and optimize its value-creation process, a globally operational supplier of vehicle components was in search of an automated intralogistics solution. As part of the project, they needed an efficient system to be developed to transport large goods carriers without forklifts and in confined spaces. Grenzebach rose to the challenge and designed a custom conveyor system that not only met a tight time frame but was also tailored to the specific dimensions of the goods carrier and the spatial constraints. Through close collaboration and extensive on-site analyses, Grenzebach established the precise circumstances and requirements, which resulted in optimal integration of the technology. In the first project phase, bidirectional automated guided vehicles, type L1200S, were installed, with phase two of the project seeing the addition of omnidirectional vehicles, type OL1200S. The result is a customized solution that afforded our customer more flexibility in production and helped to increase its efficiency.

Our unwavering endeavors to develop sustainable solutions have secured long-lasting partnerships with our customers—one clear example of this is the successful collaboration with one of the world’s leading aluminum manufacturers. In 2024, we received another major order from this customer for two further production lines manufacturing gypsum plasterboard in its plant in Chiping-Liaocheng in the Shandong Province of China.

With this addition, our customer is equipped to produce approx. 830,000 square meters of plasterboard—that equates to 120 football pitches and makes this plant one of the world’s largest for gypsum plasterboard production.

This is the second time the customer has turned to Grenzebach for expertise. Having successfully supplied two production lines in 2021 that recycle exhaust gases to produce FGD gypsum, we are delighted to build on this partnership further. The new facilities utilize both the generated electricity and the exhaust steam from the coal-fired plants for an even more sustainable production process.

This ongoing collaborative partnership shows that Grenzebach is not only a provider of innovative solutions, but also a long-term journey partner to its customers. We relish the opportunity to create new successes with our customers and to further develop sustainable solutions for the industry.

A MATTER OF PRINCIPLE FOR THE ENVIRONMENT AND NATURE

Honest. Far-Reaching. Forward-Thinking.

Ideenreichtum und der verantwortungsvolle Einsatz umweltfreundlicher Ressourcen bestimmen das unternehmerische Handeln bei Grenzebach. Seit Jahren setzen wir Zeichen mit gleichermaßen ökologischen und ökonomischen Produktions- und Automatisierungslösungen. Gleichzeitig achten wir auf unseren eigenen Fußabdruck.

We Rely on Efficient Use of Resources and a Sustainable Circular Economy.

As part of our sustainability strategy, the Grenzebach Group pursues wide-ranging targets to reduce CO2 emissions, conserve resources, and promote a circular economy. We also develop machines and plants with a long service life so that these not only work efficiently but are also sustainable within the overall product life cycle. These measures bring about a significant reduction in Scope 3 CO2 emissions and enable our customers to save money, which can be reinvested in subsequent innovation projects and sustainability initiatives.

We also give due thought to the circular economy when developing new solutions. For instance, did you know that you can recycle asphalt?



Mathias Fälber
Sales Manager Process Technology

“EVERY YEAR, SOME 3.3 MILLION METRIC TONS OF TAR-BASED ROAD SURFACE IS DEMOLISHED THROUGHOUT GERMANY. THERE IS A LEGAL REQUIREMENT FOR 600,000 METRIC TONS OF THIS CONTAMINATED MATERIAL TO BE EXPORTED TO THE NETHERLANDS FOR THERMAL ASPHALT RECYCLING.”

The costs and environmental impact of this are enormous. This is why the Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT is developing an innovative method for making it cheaper and more environmentally friendly to recycle asphalt from broken-up road surfaces containing tar and bitumen. Called the “InnoTeer” method (“Teer” being German for tar), it is a decentralized method that lowers recycling costs and upholds the necessary quality of recycled material, including for use in top courses and binder courses. While the Fraunhofer researchers were responsible for developing the new method, including laboratory tests and evaluations, Grenzebach, as a well-respected plant engineering specialist, was able to contribute its extensive experience in high-temperature processes, thermal process engineering, and bulk material handling to quickly implement a technical realization of the method.



“WITH THE INNOTEER METHOD, THE CONTAMINATED MATERIAL IS NO LONGER INCINERATED, WHICH GENERATES A LOT OF CO2; INSTEAD, IT IS PYROLYZED AT LESS THAN 600 °C IN THE ABSENCE OF OXYGEN.”

Michael Mayr
Director Process Technology

The resulting vapor of hydrocarbons is subsequently condensed, collected, and made available as a highly calorific fuel for the process. This way, the harmful emissions are significantly reduced, and the aggregate retains the mechanical strength required for reuse in road construction. Advantages at a glance:

Lower Costs

The decentralized recycling plants can be set up in the immediate vicinity of the asphalt mixing plants, which reduces transport costs. The process also lowers the thermal energy costs of the associated mixing plant, since the heat from the upstream recycling process reduces energy consumption.

More Sustainability

The emissions released by the pyrolysis of the tar-based or bituminous binding agents are reduced to a minimum, unlike carbon-intensive incineration methods; plus, by eliminating the process of transporting materials to the Netherlands, the carbon footprint becomes smaller still. Furthermore, the waste heat can be used straight away.

Higher Quality

The rock reliably retains its strength, which allows for an impressive recycling rate of more than 80 % of the input. The recycled mineral can be reused straight away in a marketable grain size, which conserves resources and reduces costs.

In recent years, customers in the construction industry have increasingly been searching for economically viable solutions for water recycling, especially in the face of increasing water scarcity in the dry summer months, not to mention growing legal pressure. According to current statistics (Destatis – Federal Statistical Office),

38 % of the EU population and

29 % of EU territory were affected by water scarcity in 2019, which generates annual costs of between

2 and 9 million euros. Even with some

1 million m³ municipal wastewater already being reused every year, the volume of treated water could be increased six-fold.

As a dependable journey partner, Grenzebach has actively observed the market trends and refined its solutions. The result is the newly developed water condenser for optimum water recycling. In contrast to the classic heat exchangers, the water condenser takes up far less space, making investment costs 40–50 % lower. Depending on the configuration, it also facilitates a water recycling rate of 30–85 % and consumes less electrical energy, since the cross-flow principle of the

cooling air allows for a high and constant temperature difference and a better condensation efficiency. Moreover, frequency-controlled fans create optimum process control and energy saving.



“THE BENEFITS ARE CLEAR TO SEE: THE WATER CONDENSER REMOVES THE NEED FOR ANY CHEMICAL PRETREATMENT OF THE WATER. THE CONDENSATE CONTAINS VERY LITTLE CHLORIDE AND DOES NOT IMPAIR PAPER ADHESION. WITH A WATER TEMPERATURE OF BETWEEN 45 AND 55 °C, IT CAN BE STORED IN A POND OR A POOL TO COOL IT DOWN TO BE REUSED IN DRY PERIODS.”

Dennis Schattauer
Sales Director Building Materials

We are Increasing Our Energy Efficiency and Our Customers' Too.

Within the Grenzebach Group, we have set ourselves a target to significantly increase our energy efficiency. We hope to achieve this target by means of comprehensive consumption analyses that provide us with valuable insights into potential room for improvement.

In 2024, we capitalized on major potential in the field of solar energy. Targeted investments in photovoltaic systems were made at our sites in Newnan, the USA, Jiashan, and China. With the facility in China having been moving toward rooftop installations in recent years, the 2024 expansion drove this further still, with the solar energy generated increasing by 222.59 kWh (normalized) compared with the previous year. For our site in Newnan, this was the first investment in rooftop photovoltaic systems and marked an important step toward sustainable energy supply.



“FOR US AT GRENZEBACH NEWNAN, SUSTAINABILITY MEANS ACTIVELY IMPLEMENTING ENERGY-SAVING MEASURES. IN JUNE, WE HAD SOLAR PANELS INSTALLED ON OUR ROOF BY CHERRY STREET ENERGY TO REDUCE OUR CARBON FOOTPRINT AND FEED ELECTRICITY BACK INTO THE GRID. THIS WAY, WE ARE ABLE TO PLAY OUR PART IN CREATING A CLEAN AND SUSTAINABLE FUTURE.”

Trevor Meadows
Safety Coordinator Grenzebach Corporation

As well as investing in photovoltaic systems, we also replaced our air compressors at the Jiashan facility in China. Using cutting-edge, energy-efficient compressors allowed us to increase our energy efficiency in this area by a staggering 25 %. This measure plays a major part in reducing our energy consumption and getting us closer to our sustainability targets.

But it is not just our own energy efficiency that we are mindful of, but also that of our customers. Considering this, we have strengthened the Power & Energy division of our subsidiary Millennium this past year, so as to be able to offer customized solutions for saving and distributing energy. Our team of experts develops innovative systems that meet the specific needs of diverse sectors, such as glass, building materials, utilities, and many more besides.

Focusing firmly on sustainable technologies and reliable energy supply puts us in a position to formulate groundbreaking concepts that improve our customers' energy efficiency at the same time as significantly lowering their operating costs. By applying our extensive expertise in the construction and manufacture of energy plants and system controls, as well as their installation and commission, we provide an end-to-end service that allows our customers to implement sustainable energy solutions effectively. In this regard, Millennium and Grenzebach are effectively central partners and journey companions to companies that want to be part of the transition to renewable energies and who also wish to maximize their energy efficiency.

One other important consideration in today's highly competitive landscape is how energy efficiency can be optimized, which is fundamental to staying profitable. Targeted upgrades of existing systems can dramatically improve both energy efficiency and profitability.

That is why the Grenzebach Group places such importance on dependable customer service—we are on hand to help right from the development stage through planning and execution to utilization. During the utilization stage we offer customers future-oriented updates and upgrades to prepare them for changing market requirements or modernizations made necessary by discontinuations.

For example, customers can retrofit old timber dryer models onto an end-to-end welded roof to achieve major savings on their energy bill, while simultaneously improving the overall performance and service life of their system. Traditional roofs that have been assembled together have numerous gaps between the individual panels, resulting in inadequate heat insulation and a substantial loss of heat. By contrast, the welded roof brings with it better thermal insulation and provides for optimum temperature control inside the dryer.



“THIS NOT ONLY REDUCES ENERGY CONSUMPTION, BUT ALSO MINIMIZES MAINTENANCE COSTS, BECAUSE THE ROBUST ROOF NEEDS REPAIRING AND REPLACING LESS OFTEN. CONSEQUENTLY, OUR CUSTOMERS BENEFIT FROM LOW ENERGY BILLS AND LOW MAINTENANCE COSTS—ALL IN ALL, A SUSTAINABLE AND COST-EFFECTIVE SOLUTION.”

Kai Hofmann
Sales Manager Service Building Materials

We Minimize our Impact on the Environment, and That of our Customers And Suppliers.

Throughout our entire value creation chain, we continuously review and initiate measures to increase the sustainability of our supply chains and, thereby, make every product our Group produces more environmentally friendly—from manufacturing and resource procurement through to renewable electricity supply systems and building technology. This means keeping a constant eye on the latest developments and adapting our strategies and procedures as necessary.

Our target was to achieve climate-neutral status at our Hamlar site by 2025, in part through the conversion to a cogeneration plant. In July 2024, however, we were hit by historic flooding that meant we had to revise our plans. Strong teamwork—both within the Hamlar site and between our other sites—enabled us to tackle the challenges caused by the floods and we were able to keep operating and keep serving customers.

Following the floods in July 2024, we are concentrating on rebuilding and developing Hamlar. This will see the creation of cutting-edge workspaces and modular production areas that allow us to integrate future-oriented technologies and standards, including a flood protection concept.

The “new” Hamlar will stand out for the following characteristics

- » Modern office concepts and co-working areas for appealing office workstations with flexible workplace design
- » Accessibility
- » High level of energy efficiency to lower energy consumption and drive forward sustainability
- » Optimized use of the available space

The southern plot is ideal for development and expansion, because there is more space available here and a closed production and logistics concept can be better implemented.



“WE ARE INVESTING IN THE HAMLAR SITE AND PLANNING BUILDING WORK AND RENOVATIONS. THIS WORK WILL BE FOCUSED ON THE SOUTHERN SECTION OF OUR SITE..“

Egbert Wenninger
Managing Director Hamlar & SVP Business Unit Glass

Our aim is to complete the renovation works by summer 2027 and thereby take a decisive step toward our climate-neutral target. By optimizing our own facilities, we see the potential to also reduce Scope 3 for our customers and partners.

RESPECT FOR PEOPLE AND PLACES

Sustainable. Thoughtful. Responsible.

Every individual has the opportunity—and the responsibility—to help shape society. This is particularly true of companies like Grenzebach. It is a duty that the Group takes particularly seriously. For years, Grenzebach has been supporting not just its employees, but also social projects and organizations. The focus of these initiatives is placed on the regions around the Grenzebach sites.

We Promote Occupational Safety for our Employees.

We want to create a space where our employees feel happy, safe, and valued. This is why we place great importance on sustainable occupational health and safety. We also take care to provide fair working conditions and pay. Remuneration and benefits are at least equal to the statutory and guaranteed minimum.

At our sites, we implement extensive measures to identify and eliminate potential safety risks early on. This includes diligent reporting of environmental accidents, providing regular preventive medical check-ups, and performing emergency drills in line with our emergency plans. These activities create a safe working environment and raise awareness for safety in all work areas.



“AT OUR SITE IN NEWMAN, WE HAVE ESTABLISHED A DYNAMIC SAFETY CULTURE THAT ALLOWS EACH AND EVERY EMPLOYEE TO RETURN HOME FEELING SAFE, HEALTHY AND MOTIVATED. OUR COMMITMENT TO OCCUPATIONAL SAFETY AND OUR TEAM’S WELL-BEING IS UNSHAKABLE AND PROVES THAT

ANYTHING IS POSSIBLE WITH THE RIGHT MINDSET.”

Trevor Meadows
Safety Coordinator Grenzebach Corporation



We Strengthen Product and Service Responsibility.

Strengthening our employees’ sense of responsibility to the products and services we provide is fundamental to our sustainable corporate strategy. We believe that every individual should take responsibility not only for their own work tasks, but also for the quality and sustainability of our products and services. To deepen this sense of responsibility, we provide comprehensive training courses and professional development programs, empowering our employees to develop the best possible solutions for our customers, while also fulfilling ecological, economic, and social standards.

By nurturing a deep awareness of quality and responsibility, we encourage our teams to come up with innovative ideas and integrate sustainable practices into their daily work. We consider it essential that our employees have knowledge of our processes and applications, including SAP for example, so that they can take responsibility for products and services. Knowledge is everything. This is why we have introduced the Access knowledge platform that offers our employees targeted support and assistance in dealing with our systems.

Measures such as these engender a stronger sense of dedication to the success of our products and services and facilitate responsible use of resources. This leads to positive customer experience, since we prioritize service quality and customer satisfaction.



“IN THE TIME SINCE ACCESS WAS FIRST INTRODUCED, THE AVERAGE NUMBER OF USERS HAS DOUBLED AND THE NUMBER OF RETURNING USERS HAS CONTINUED TO GROW. WE PLAN TO KEEP EXPANDING THE TOOL TO INTEGRATE OTHER IMPORTANT APPLICATIONS AND INCREASE THE USAGE RATE FURTHER STILL.”

Vanessa Hieber
IT Business Partner Grenzebach Group

We Pave the Way for Professional and Personal Successes.

A core element of the Grenzebach Group's corporate culture is in laying the foundations for professional and personal successes. We promote sustainable health management and occupational safety, and establish a pleasant, inclusive working environment that values the diversity of our employees. Every employee plays a decisive role in the success of our company, which is why we place such importance on each individual's personal and professional development.

Equal opportunities are central to this: irrespective of gender, age, origin, skin color, religion, culture, or other characteristics, we treat all employees objectively and judge them only on their abilities. We do not tolerate discrimination of any kind and treat people with respect and an open mind.

By providing regular training and promoting a positive working atmosphere, we create ideal conditions to maintain employee satisfaction and efficiency—which, in turn, contributes to the success of the Grenzebach Group.



“IN 2024, WE DELIVERED SIX MANDATORY TRAINING COURSES AT OUR HAMLAR SITE ALONE, AS WELL AS SOME 200 VOLUNTARY TRAINING COURSES AND WORKSHOPS. ON AVERAGE, EACH EMPLOYEE TOOK PART IN SEVEN TRAINING COURSES.”

Julia Hader
HR Development Advisor Hamlar

MONITORING SUPPLY CHAINS—SAFEGUARDING SUCCESS

Decisive. Transparent. Binding.

Throughout our entire value chain, we continuously review and implement improvements to make our supply chains more sustainable and make every product more environmentally friendly. This applies to manufacturing, procurement of resources, avoidance and responsible use of conflict materials, transportation routes, disposal methods, and infrastructure. In these areas and more besides, the Grenzebach Group has already initiated efficient and eco-friendly measures.

We are thinking of tomorrow today: Our guidelines are implemented and are continuously further developed to make us even more sustainable. We strive to protect the environment and human rights within our supply chains and demand this level of responsibility from our suppliers as well.

Our risk management team evaluates human rights risks and environmental risks in our processes. Prevention measures are then specified and implemented. These risk analyses are regularly updated over the course of the business year and evaluated by the company management at the end of the year.



We are Expanding the Reporting System for Compliance with Laws and Environmental and Social Standards.

As part of our sustainability strategy, we consistently and systematically adhere to the German Supply Chain Act (LkSG). Our in-house LkSG guideline lays out clear rules and procedures that apply to all employees and subsidiaries responsible for administering our supply chains. The objective of this is to ensure that all parties are aware of the requirements and actively implement them.

Central to this implementation is the annual risk analysis. This identifies and assesses 13 major risks in relation to human rights and environmental protection throughout the supply chain—from suppliers to subcontractors and on to partner companies. The risks are evaluated on a scale of 0 to 6, with risks being prioritized according to urgency, so that targeted measures can be derived to reduce risk.

We use the Osapiens software solution to support this process, enabling us to record and assess risks transparently. Suppliers are only approved if their risk score is below 3 and if the necessary preventive measures have been implemented. If, however, there is no improvement despite all efforts, we reserve the right to suspend the business relationship. No more than 1 % of our suppliers are permitted to be rated high risk—and only ever on a short-term basis, limited to a maximum of three months.

To check our measures are working, we regularly collect feedback directly from our stakeholders, including but not limited to customers and suppliers. Until now, opinions were canvassed from representative groups, but we are increasingly replacing this with direct communication so that we can form a complete and reliable picture.

“AT PRESENT, AT LEAST 90 % OF OUR PROCUREMENT VOLUMES SCORE POSITIVELY IN THE RISK EVALUATION (MAXIMUM OSAPIENS SCORE: 2.99). THIS SYSTEMATIC AND TRANSPARENT APPROACH ENSURES GRENZEBACH FULFILLS NOT ONLY ITS LEGAL REQUIREMENTS, BUT ALSO ITS RESPONSIBILITY FOR ENVIRONMENTAL AND HUMAN RIGHTS ALONG THE ENTIRE SUPPLY CHAIN.”

Stefan Leibhammer
Senior Manager Global Purchasing Grenzebach Group

We Monitor and Optimize our Material Consumption.

The Grenzebach Group takes the matter of sustainable waste recycling seriously and is systematically expanding this. The site-specific waste management systems help to keep costs down, prevent unnecessary waste, and help to care for the environment since they are based on recycling. At the same time, we are committed to reducing material consumption by adopting a sustainable approach to product life cycles and performing targeted material analyses.



“AT THE PRODUCTION SITES, THE WASTE IS SORTED, RECORDED, AND REINTRODUCED INTO THE CYCLE VIA THE WASTE DISPOSAL COMPANY. HAVING CONTINUOUSLY STREAMLINED THIS PROCESS, WE HAVE BEEN ABLE TO INCREASE EFFECTIVENESS BY 5 % (NORMALIZED) AND CUT CO2 EMISSIONS

BY APPROX. 1,200 METRIC TONS.“

Dominik Schwarz
Sustainability Manager Grenzebach Group

As part of our ongoing efforts to make production more efficient and optimize material consumption, we have implemented the 6S method in our production processes. This well-established method, which is based on the five “S” steps of sort, set in order, shine, standardize and sustain, facilitates a systematic approach to improving our material handling.

By sorting, we identify and eliminate unnecessary materials within production. This prevents excess stock and reduces waste significantly. Setting in order then allows for the required materials to be found quickly and efficiently. This way of organizing reduces the frequency of mistake purchases and promotes the optimum use of available resources.

The next S, shine, highlights the importance of keeping the working environment clean. A clean workplace helps us to identify and resolve potential issues, such as material waste, at an early stage, while standardization of processes and material use establishes more consistency and minimizes rejects.

The S for sustain promotes an overall awareness of material consumption and waste prevention. Our employees are trained to spot inefficient practices and suggest how these can be improved. With the sixth S—safety—the employee establishes a working environment that not only makes efficient use of the material, but is also safe, for example, because hazardous goods are disposed of properly.

Enduring commitment to these principles means that we integrate the material savings achieved into our corporate culture in the long term. We strive to continuously monitor and further improve our processes to use resources responsibly and shape a sustainable future.

We are Continuously Expanding our Knowledge for Legal Certainty.

We place great importance on continuously expanding our knowledge to maintain legal certainty and compliance in all areas of business. We actively invest in our employees’ training and professional development so that they are always informed of the latest legal requirements and regulations. Through regular workshops, internal training courses and dialog with external experts, we keep our knowledge up to date and create an in-depth understanding of the legal framework relevant to our activities. This not only makes our processes more robust but also strengthens the trust our stakeholders hold in our company. Our commitment to legal certainty is an integral element of our corporate philosophy and makes a vital contribution to our long-term sustainability strategy.

KEY DATA FOR THE 2024 SUSTAINABILITY REPORT

Format and Cycle

The Grenzebach Group’s 2024 sustainability report is available online and as a printed publication. Its contents are available to download as a PDF from www.grenzebach.com. The sustainability report is revised in its entirety every year.

Auditing Sustainability

We voluntarily undergo external audits for/by ISO, TISAX, the Initiative Ludwig Erhard Preis (ILEP) and other frameworks. To view our current certificates, please visit [our website](#).



Content of the Report

The 2024 sustainability report is focused on the key sustainability issues and strategic alignment. The time frame reported on covers the entire business year of 2024 (January 1 to December 31, 2024). The editorial deadline for the original German-language report was June 30, 2025. The target groups for the publication are customers, suppliers and business partners, employees, scientific institutions, media representatives, and other interested stakeholders.

ESG Report for Auditors

In addition to this sustainability report prepared for stakeholders, the Grenzebach Group is preparing the official sustainability report as per legal requirements. This report will be available to request from 2028 by e-mailing (sustainability@grenzebach.com).

ISO MANAGEMENT REVIEW

The management review forms an important part of certification. It contains the regular, formal review by responsible managers to assess the effectiveness of our IMS and check that it is still suitable, appropriate, and effective.

Within the management review, the sites of the Grenzebach Group are abbreviated as follows in accordance with the defined certification matrix: GBSH = Grenzebach BSH GmbH, GH = Grenzebach Maschinenbau GmbH, GN = Grenzebach Corporation Inc., GROM = Grenzebach Romania S.R.L.

The management review is audited by TÜV Nord.

ISO-relevant Topics

The ISO standards for management systems contain various points for assessment. We have selected those that we deem important and those that help us to reach our sustainability targets.

Based on this selection, the following topics were considered relevant to the Grenzebach Group for 2024:

- » Performance of our processes
- » Performance of our external service providers
- » Fulfilling potential for improvement
- » Costs of errors
- » Energy (electricity and gas consumption)
- » Occupational safety (accidents)
- » Digitalization
- » Operational excellence

IMS Group Targets

Group-wide IMS targets are established based on following topics and updated every three years as part of an audit cycle (2023–2025). We set ourselves these group targets in the interest of continuously improving our audited and certified management systems in the fields of quality, environment, health, and safety. We define these targets ourselves and actively endeavor to reach them.

QUALITY MANAGEMENT (ISO 9001)

- » To reach an average process fulfillment rate of ≥85 % for recertification from 2023 by the end of the next certification period (2025)
- » To reduce the percentage of error costs to less than 1.3 % of operating output

SUSTAINABILITY

- » To make CO₂e emissions across at least three production sites more measurable by 2025 using TANSO planning decarbonization software
- » To compose an ESG stakeholder report for the Grenzebach Group covering the year up to 12/2024

ENERGY (ISO 50001)

- » To reduce consumption of one of the top three Significant Energy Users (SEU) by 3 % jumping-off-point (JOP) 2022 → site-specific
- » To make the monthly consumption of all SEUs more measurable relative to overall consumption (JOP 2022) by means of monthly tracking using EFFICIO (software for energy management and environmental management) → site-specific

ENVIRONMENT (ISO 14001)

- » To improve a significant environmental aspect by 1 % vs. JOP 2022 → site-specific
- » At least one Grenzebach system audit of one or more environment-relevant service providers

OCCUPATIONAL SAFETY (ISO45001)

- » Occupational safety in third-party companies: to lower the average value of deviations identified to less than one instance per assignment of third-party companies
- » At least 80 % of the occupational safety incidents recorded in QUENTIC must be subject to a root cause analysis, and a minimum of one corrective measure must be defined for each of the analyzed incidents

Measures

Taking the 2023 management review and our external audits as a basis, specific measures are derived for the next year to deliver continuous improvement in the following areas:

1. Measures for dealing with risks and opportunities
2. Quality targets and plans to achieve them
3. Energy assessment
4. Energy starting point
5. Resources
6. Awareness
7. Operational planning and control
8. Emergency planning and response
9. Monitoring, measurement, analysis, and review
10. Management review

In the reporting year, five of these defined opportunities for improvement were successfully implemented, three are still in implementation, and two are still under discussion.

Implementing Measures and Reaching Targets

In relation to the Group's IMS targets, we present the following specific measures and the achievement of selected targets.

QUALITY MANAGEMENT (ISO 9001)

TO INCREASE THE PROCESS FULFILLMENT RATE FROM 80 % TO ≥85 %

The process fulfillment rate is an indication of the extent to which a specific process or a specific capacity is used within the Grenzebach Group and helps us to assess the efficiency and effectiveness of our processes.

Year	Locations				Target
	GBSH	GH	GN	GROM	
2020	+3.4	-20.4	+6.8	-	85
2021	+4.7	+0.5	+5.9	-	85
2022	+5	-2.0	+3.2	-19.4	85
2023	+4.6	-7.8	+5	-	85
Tl(n)	→	↓	→	-	
2024	-0.6	-3.2	-2.0	-10.2	85
Tl(n)	→	↓	→	→	

Note: The values indicate the deviation from the target value in the form of a percentage. If the deviation is a positive value, the figures are shown in green; if the deviation is negative, the figures are shown in red, and if there is no deviation, no color is applied. The arrows show the trend of the average performance relative to the target applicable for the auditing cycle. Tl stands for target indicator (o = old, n = new). If most arrows indicate a positive trend, the target value will be revised upward. If the target level is not reached, the target is not revised downward, but rather the process performance is further improved until the target is reached.

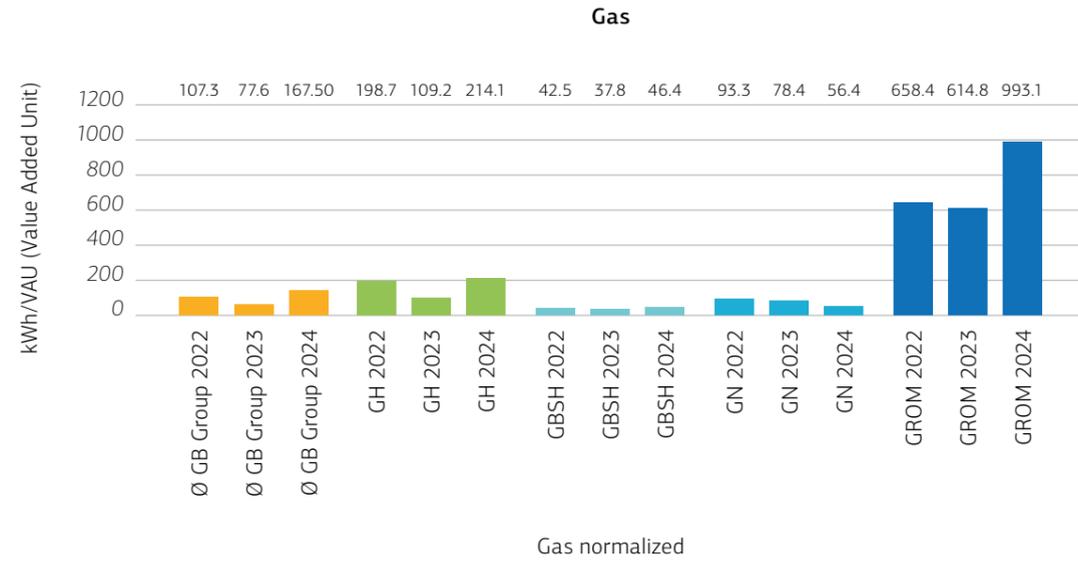
In 2024, the process fulfillment rate was successfully increased at the GH and GROM sites, indicating that targeted measures are effective. By contrast, this rate fell at the GBSH and GN sites. The results show that there is still room for improvement at individual sites. Corresponding measures to stabilize and develop the processes are in planning, or in some cases already initiated.

TO REDUCE THE PERCENTAGE OF ERROR COSTS TO <1.3 %

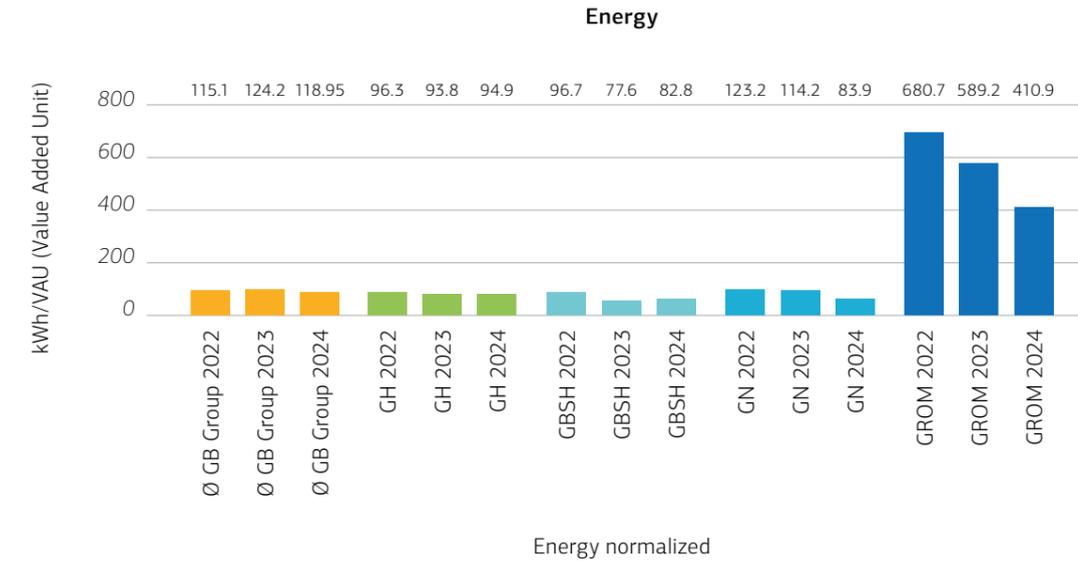
Error costs are those costs incurred due to errors in a production process or a service. The Grenzebach Group categorizes these into internal/external error costs and preventive and evaluation costs. Error costs can have a major impact on the profitability of our Group, which is why we endeavor to always keep these to a minimum through effective quality management practices. To make this measurable, we declare the error costs in relation to operating output. For 2024, a target value of 1.5 % was set (2023: 1.3 %). In 2024, the operating output was 678.2 million euros (2023: 424 million euros). The error costs totaled 9.1 million euros (2023: 6.4 million euros), which equates to a rate of 1.3 % (2023: 1.51 %). Through our Operational Excellence initiative, we are planning to reduce the overall error costs further still.

ENERGY (ISO 50001)

TO REDUCE ENERGY CONSUMPTION OF ONE OF THE TOP THREE SEUS BY 3 %



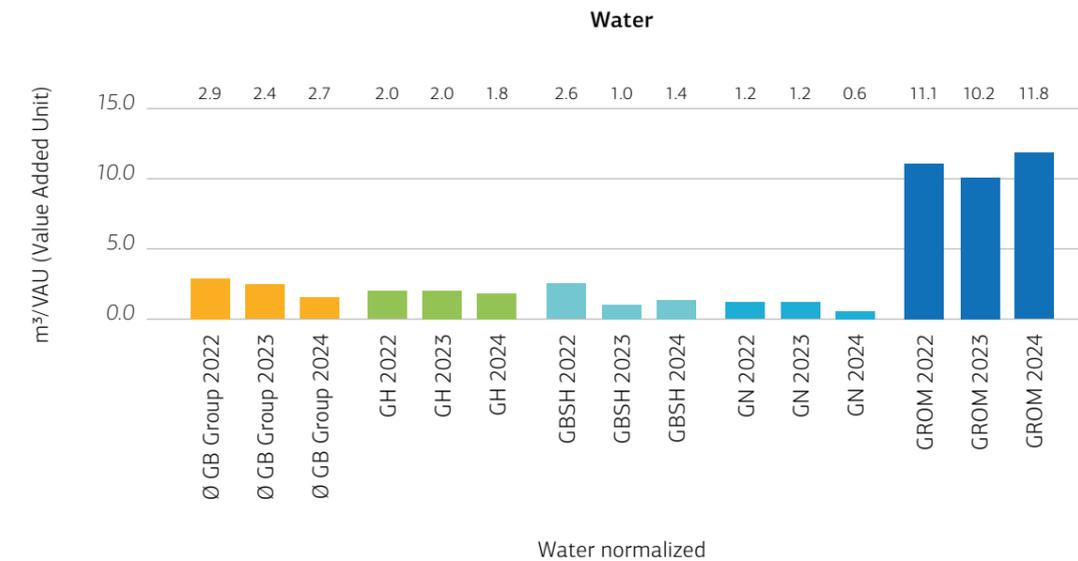
Note: The chart shows the Grenzebach Group's gas consumption in kWh, normalized by means of several parameters, e.g. production hours or employee attendance (this normalizing parameter is called VAU [Value Added Unit]), in comparison with the audited sites for 2022–2024. In a year-on-year comparison, the normalized gas consumption of the entire Group rose slightly.



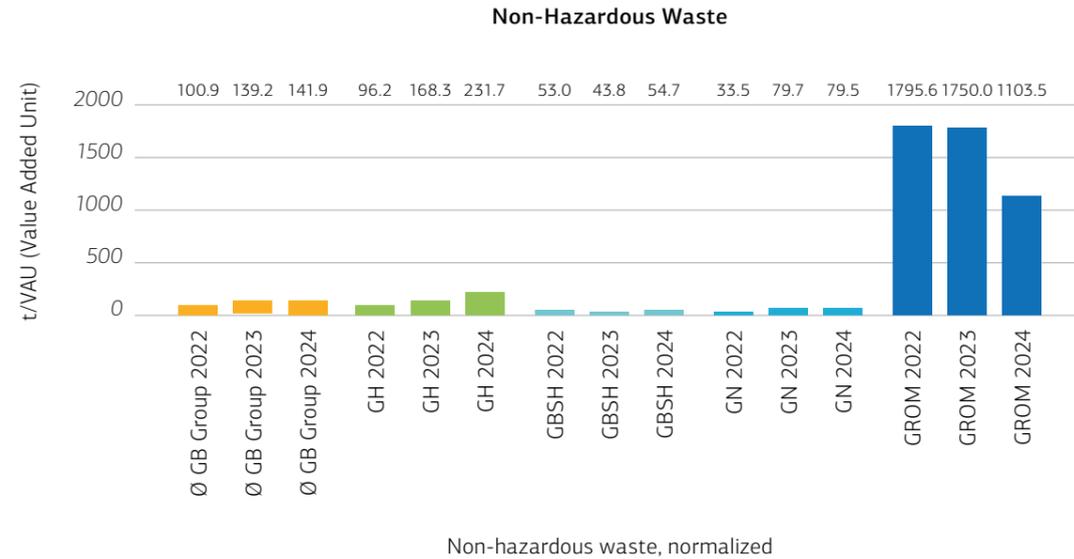
Note: The chart shows the Grenzebach Group's energy consumption in kWh, normalized by means of several parameters, e.g. production hours or employee attendance (this normalizing parameter is called VAU [Value Added Unit]), in comparison with the audited sites for 2022–2024. The normalized energy consumption fell across the entire Group.

ENVIRONMENT (ISO 14001)

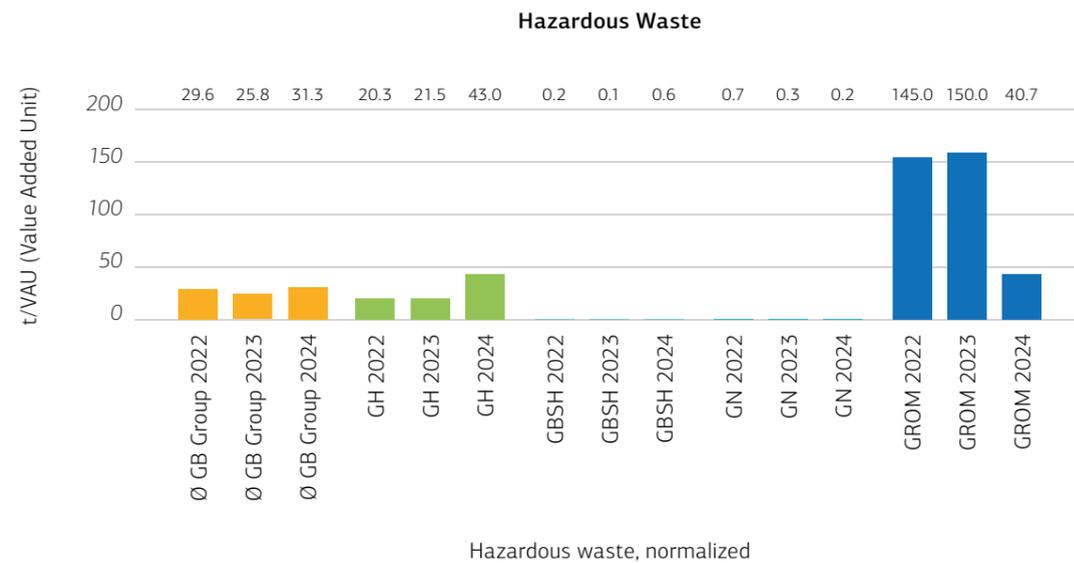
TO IMPROVE A SIGNIFICANT ENVIRONMENTAL ASPECT BY 1 % VS. JOP 2022 → SITE-SPECIFIC



Note: The chart shows the Grenzebach Group's water consumption in m³, normalized by means of several parameters, e.g. production hours or employee attendance (this normalizing parameter is called VAU [Value Added Unit]), in comparison with the audited sites for 2022–2024. The normalized water consumption of the entire Group fell.



Note: The chart shows the volume of non-hazardous waste accrued by the Grenzebach Group in metric tons (t), normalized by means of several parameters, e.g. production hours or employee attendance (this normalizing parameter is called VAU [Value Added Unit]), in comparison with the audited sites for 2022–2024. The normalized volume of non-hazardous waste of the entire Group increased. The higher occurrence of waste can be attributed to the GH site and its cleanup efforts and waste management following the historic flooding.



Note: The chart shows the volume of hazardous waste accrued by the Grenzebach Group in metric tons (t), normalized by means of several parameters, e.g. production hours or employee attendance (this normalizing parameter is called VAU [Value Added Unit]), in comparison with the audited sites for 2022–2024. The normalized volume of hazardous waste of the entire Group increased. The higher occurrence of waste can be attributed to the GH site and its cleanup efforts and waste management following the historic flooding.

OCCUPATIONAL SAFETY (ISO45001)

AT LEAST 80 % OF THE OCCUPATIONAL SAFETY INCIDENTS RECORDED IN QUENTIC MUST BE SUBJECT TO A ROOT CAUSE ANALYSIS, AND A MINIMUM OF ONE CORRECTIVE MEASURE MUST BE DEFINED FOR EACH OF THE ANALYZED INCIDENTS

The Grenzebach Group records rates of accident and illness. Overall, the act of recording these incidents contributes to a safer working environment and improved employee health and well-being. This enables us to identify potential risks and take targeted measures to minimize these.

Year	GBSH (310)			GH (650)			GROM (300)			GN (110)		
	Minor injury	Serious injury	CAPA	Minor injury	Serious injury	CAPA	Minor injury	Serious injury	CAPA	Minor injury	Serious injury	CAPA
2020	5	1		32	4					2	0	
2021	8	2		57	6					2	1	
2022	5	0	4	57	8	49	0	0	0	1	1	
2023	5	3		67	10	63	4	–		1		1
2024	8	1	7	30	10	7	2	1		1		1

Note: Average percentage of injuries recorded to be followed up with a root cause analysis and CAPA (Corrective and Preventive Action) ≥80 % (site-specific). The arrows show the performance trend in comparison with the previous year (JOP).

To be able to carry out a root cause analysis, we also record other figures, such as days of absence or the use of our company doctors. The Grenzebach Group then uses this as a basis for implementing corrective measures to increase occupational safety.

SPECIAL MEASURE

SUPPLIER AUDITS

The quality and reliability of our suppliers are vital to the success of our products and services. Consequently, we carry out regular supplier audits to continuously measure supplier quality and monitor the performance of our external partners. Our approach is thorough: we verify the degree of achievement by performing exacting inspections on incoming goods to check that all materials supplied meet our high standards.

The following key figures were recorded in 2024:

Site	Supplier Audits Completed	Measures and Discrepancies Identified	Measures Successfully Implemented & Discrepancies Rectified
GH	4	12	3
GBSH	8	0	0
GN	3	4	4
GROM	2	0	0

Where deviations are found or potential for improvement is identified, we take a proactive approach. This means that we not only analyze data but also hold discussions on site to develop solutions together. Our audits are not only reactive, but also preventive: We place emphasis on the continuous monitoring of suppliers, conducted on the basis of random checks or situational necessity. If a supplier is found to be producing inadequate quality, we document this systematically in complaint reports and initiate targeted measures. These quality management reports, as they are known, are tracked via SAP.

We also take the requirements of the German Supply Chain Act (LkSG) into account when conducting our audits. An integral element of our audit system is to also question suppliers on environmental, social and governance (ESG) matters. This is done by means of targeted questionnaires and site visits, during which we evaluate aspects of process and quality. This way, we can make sure that our supply chain is not only efficient, but also sustainable and responsible.

This holistic approach affirms our commitment to sustainability and quality—the core components of our long-term corporate strategy.

Future Measures

As part of our management meetings, we analyze which measures have been initiated and how their effectiveness is being monitored. We then perform audits to identify serious deviations or potential for operational improvements. The proposals that come from these discussions are incorporated directly into future projects as part of our continuous improvement process.

Communication

Equally important to us is to have a strong information and communication policy. An open and transparent flow of information is a prerequisite for trust and a high level of motivation. Let's make a sustainable future together. For more information about our IMS and the corresponding measures, visit our website (www.grenzebach.com/en/company/sustainability). If you have any questions, please do not hesitate to contact our Global Quality Team (info@grenzebach.com), managed by



Frank Wenger
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Forward-looking Statements

The sustainability report contains forward-looking statements about anticipated developments. These statements are based on current estimates and are by their very nature subject to risk and uncertainty. The actual outcomes may differ from the statements formulated here.



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