

pulse

The ElringKlinger AG Magazine
Issue 2023

The transformation

The automotive industry is undergoing a process of transformation. ElringKlinger is evolving into a global supplier in the field of electromobility.

Made in Europe

ElringKlinger is contributing to the process of establishing a value chain for the European battery industry.

Challenge accepted!

A clear vision – sights set firmly on the goals: ElringKlinger displays flexibility and foresight in its efforts to meet current challenges.

ElringKlinger – Facts & Figures

As an automotive supplier, ElringKlinger develops high-tech solutions for all types of drive system, the aim being to actively shape the present and future era of sustainable mobility.

EUR **1,798** MILLION

was the total revenue generated by ElringKlinger in the 2022 financial year.

5 %

of Group revenue was spent on research and development in the year under review.

9,540

people were employed by ElringKlinger around the globe as of December 31, 2022.

ElringKlinger

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Dr. Stefan Wolf,
CEO of ElringKlinger AG

Dear Readers,

Times are changing, and no more so than in the field of mobility. New forms of drive technology are becoming increasingly prevalent throughout the market. At the same time, hydrogen is evolving into an important energy carrier. Corporate responsibility is a key issue in pursuit of Industry 5.0, a world in which production and products are based on sustainable structures and digital networks.

ElringKlinger has already taken important steps forward in an effort to exploit the opportunities this transition presents. Our focus is on next-generation technological solutions, such as batteries and fuel cells. We have successfully positioned ourselves for the mobility of the future – with modules and systems as well as with components. Revenue generated from sales in the electromobility market will continue on a trajectory of steady growth. Having said that, none of this will come to fruition without the contribution of humans – a key factor in the equation. ElringKlinger's employees are of central importance to the company's success.

We invite you to immerse yourselves in the world of transformation at ElringKlinger over the next few pages.



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Go!

Whether your chosen arena is top-level sport or business, it all comes down to speed. Dr. Stefan Wolf, CEO of ElringKlinger AG, and Alexandra Burghardt, sprinter and pusher in the two-woman bobsleigh, discuss why staying still isn't an option and how someone can put their strengths to the best possible use.

All roads lead to Suzhou

In 2022, the high-tech city of Suzhou became home to a new site for EKPO Fuel Cell Technologies GmbH (EKPO). Find out why the Chinese subsidiary plays a key role in the company's growth plans and how the joint venture intends to tap into the Asian market.

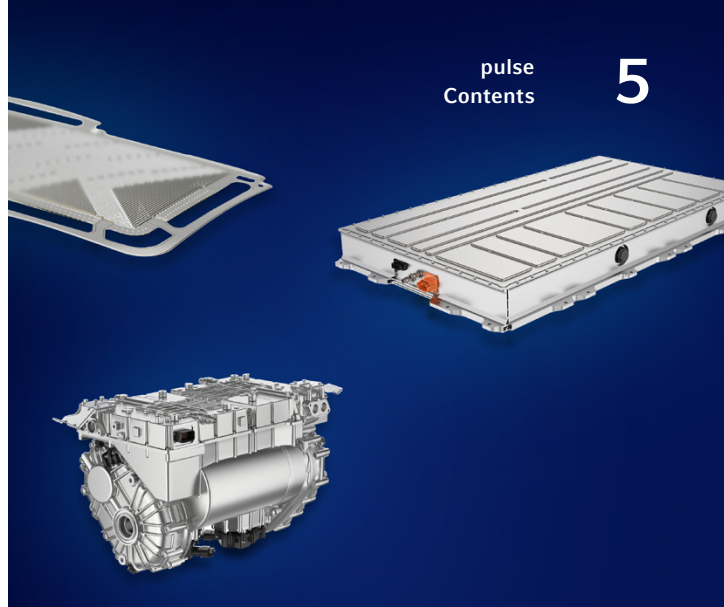
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Sustainability is firmly established in ElringKlinger's strategy and a key element of our corporate culture. We enable sustainable mobility with our products and aim to be a CO₂-neutral company by 2030. In Pulse magazine we show the wide range of sustainability at ElringKlinger.



30 The transformation

ElringKlinger is driving the transformation of mobility. The company is evolving from a supplier for vehicles with combustion engines into a global provider of e-mobility solutions. Find out how the Sealing Technology unit is shaping the process of transformation.



>> The fuel cell unit has evolved significantly since I started. That's given me the opportunity to shape some of it. So, my main duties have changed a lot over this time. <<

42 Vibrant People

What changes do employees experience over the course of their careers at ElringKlinger and how do they manage them successfully? Insights into exciting careers.


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POWER OF CHANGE






Where does a company draw the strength from to press ahead with its transformation? Even more when following a time of upheaval? The answer is not obvious and is not visible. What is visible: the results, but they have their origin in some unique attributes. Three of them are presented in the series of images below.



AN- TICI- PATION



By identifying the trends of tomorrow today, ElringKlinger is able to gear itself up for change. One example of this is our fuel cell technology. Imagination lies at the root of every idea. The fuel cell harbors huge potential for our world of tomorrow, and we're not just confining our imagination to mobility here.





INNO- VA- TION

Innovation is everywhere and is part of our company's philosophy. We're working toward finding good solutions not only in our customers' interests but also, and more importantly, in the interests of the bigger picture. Looking out for the next generation is what drives us.

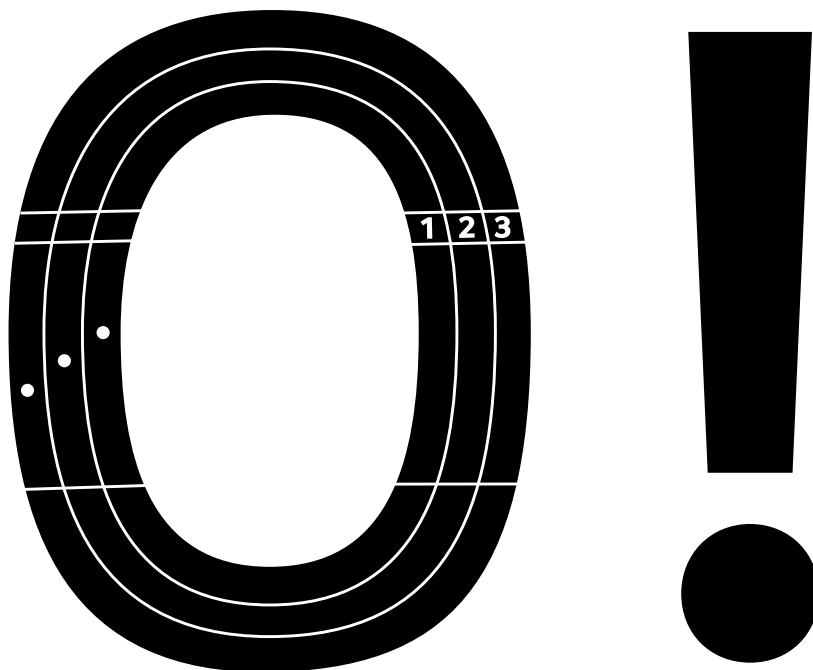


CON- CEN- TRATION

Being focused on what is essential is particularly important in times of major change. ElringKlinger is setting some clear objectives and wants to help shape the mobility of the future. And do so in a climate-friendly way. Such as by making the whole Group carbon-neutral by 2030.







Whether your chosen arena is top-level sport or business, it all comes down to speed. While runners aim to leave their competitors trailing in their wake, ElringKlinger has picked up the rapid pace of the automotive industry as it undergoes major change. This interview brings together Alexandra Burghardt, sprinter and pusher in the two-woman bobsleigh, and Dr. Stefan Wolf, CEO of ElringKlinger.

No sooner had Alexandra Burghardt finished training at the German national athletics training center in Munich's Olympiapark than the elite sportswoman was meeting ElringKlinger CEO Dr. Stefan Wolf for a conversation at the Olympiastadion right next door. It was here that the sprinter won relay gold at the 2022 European Championships, having already been on the podium half a year earlier as a silver medalist in the two-woman bobsleigh at the Beijing Winter Olympics. Whether she's on the running or the bobsleigh track, Alexandra Burghardt is the woman to beat when it comes to speed. She talks to Dr. Stefan Wolf about why staying still isn't an option and how someone can put their strengths to the best possible use.

Ms. Burghardt, when does speed thrill you the most?

Alexandra Burghardt: When I'm sprinting, at that moment when I'm accelerating out of the starting blocks and I hit my top speed. In those few seconds, I feel the power increasing with every step. It feels fantastic when this power doesn't fizzle out, isn't slowed down by anything.

You're considered to be a brilliant starter.

Alexandra Burghardt: Yes, that's why I enjoy it so much [laughs]. But bobsledding has taught me another side to speed. When I'm running the 100 meters, my average speed is somewhere around 33.5 kilometers an hour. In the bobsleigh, we can get up to 130 km/h, although as a pusher I'm at the mercy of whatever speed our sled is going at, combined with 100% trust in my pilot. The forces I'm exposed to in the bobsleigh are unique. They go up to six or seven g...

... by way of comparison, the fastest rollercoaster in Germany has a maximum force of four g.

Alexandra Burghardt: When you're in the bobsleigh, it pushes your head down. You feel the force of your speed so much that you're no longer in control of what you're doing.

Dr. Wolf, when do you feel speed and dynamism in your company?

Dr. Stefan Wolf: Definitely with the speed at which electromobility is making progress at the moment. We spent a long time as a supplier of components for combustion engines – the traditional business in the automotive industry. As early on as 20 years ago, I realized that there'd come a change: moving away from the combustion engine and toward new, climate-friendly drive technologies. Even back then, therefore, we began to come up with innovations for the fuel cell. Battery technology was then added 15 years ago. So we were on it very quickly – and yet I'm still surprised by the speed of this change that we're now seeing in Europe in particular. And this pace will definitely keep on picking up. Because of the various sets of regulations, but also because people are demanding this much speed, especially the younger generation.

Ms. Burghardt, you came here in an electric car.

Alexandra Burghardt: Absolutely. I generally really like driving and am happy to say that electromobility has become a lot more convenient over the past few years, both in terms of the actual driving and the quality of the charging infrastructure.

Dr. Stefan Wolf: The convenience has to be there, that's essential. Plus there's also the fact that climate action and sustainability are continuing to grow in importance. The technologies of electromobility are without doubt the areas we should be focusing on in the future. That developments are moving ever faster is undoubtedly a good thing in our view. We can keep up with this pace.

Ms. Burghardt, if someone watches you before a race, they'll see that you become really calm and concentrated. What are you thinking about in that moment?

Alexandra Burghardt: I'm attempting to visualize the race one last time and play it through in my mind. It's a method I learned while working with my mental coach. I think about the best possible way the race could go, where I put all my training into practice.

Do you always run a new personal best in your mind's eye? 100 meters in less than 11.01 seconds, in other words?

Alexandra Burghardt: Definitely. When I'm going through the race in my head, I pull away from the other athletes and cross the line in under 11 seconds. It's not wishful thinking, though – it's part of my mental training. If I want to pull out my best performance, I first have to leave myself in no doubt that I've got it in me to do it. Feelings of self-doubt before the race won't do you much good. So I'm visualizing a perfect race in my mind.

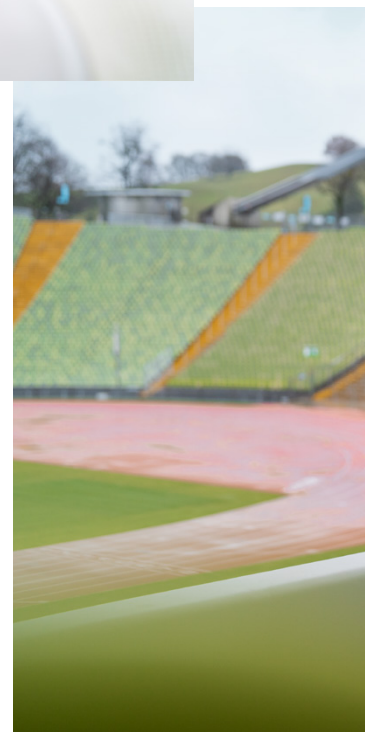
Dr. Stefan Wolf: Getting and staying ahead of the pack is what drives us too, of course, particularly in terms of technology. Here's an example: when it comes to performance density, which is a key criterion in drive technology, we're the global leader with our

»That the change is moving ever faster is undoubtedly a good thing in our view. We can keep up with this pace.«

Dr. Stefan Wolf, CEO of ElringKlinger AG



Dr. Stefan Wolf and Alexandra Burghardt are meeting for a conversation in Munich's Olympiastadion. It was here that the sprinter won relay gold at the 2022 European Championships.





» Having a plan – and then seeing it through: that's the secret to success. «

Alexandra Burghardt, sprinter and pusher in the two-woman bobsleigh



fuel cell stacks. Anyone generating 200 kW with our stacks would need 1.5 times as much volume if they were using a competitor's version. But we can't afford to be satisfied with this position of superiority. We'll have to work hard to increase our lead further with the next generation of stacks. And we also need to push the 10,000 people who work for us across the Group, but do so in a positive way: if we exert ourselves, we'll manage it! Because, although we're good, our ambition is to get even better.

Ms. Burghardt, why is it important for you to have ambitious goals?

Alexandra Burghardt: Dreaming of ambitious goals is the first step toward actually achieving them. Ahead of major competitions such as the World or European Championships, people often ask me what my goals are. I don't hold back, and deliberately so. Which sometimes leads to me just failing to reach one of these goals. Then it's not long before people say, "Big setback, that!" But I don't see it that way. If you want to achieve your goals, you shouldn't be afraid to tell everyone what they are. And if it just fails to come off once in a while...

Dr. Stefan Wolf: ...then you learn from it in order to be better next time. Absolutely right. Unfortunately, however, we in Germany don't have the same healthy culture of failure that exists in the US. If a fledgling start-up over there fails to make it, the founders tell themselves, "We'll learn from that – and do better on our next attempt." This kind of culture produces a constant stream of ideas and innovations. In Germany, by contrast, any kind of setback leaves you permanently branded a failure. I think that's completely the wrong attitude, because good developments are born out of a willingness to try things out, learn from your mistakes, and thus get better.

Ms. Burghardt, you switched sprinting coaches in 2019. Your new coach said he thought that your running technique was wrong because you were slowing yourself down with each step. How did it feel to have somebody new come up to you and say, "You're running in the wrong way?"

Alexandra Burghardt: I was extremely glad [laughs]. It's something positive, after all. After that assessment, I knew I could still get a lot better, and my coach was able to tell me precisely what I had to do to improve. It was really useful to find that out. Even though things are taking a bit longer to put into practice than I initially thought they would, I'm getting closer and closer to an optimum running technique. The dream of the perfect race is still alive! The day will come when I break the 11-second barrier; that's what I'm gearing myself up for. I'm continuing to work on the mental side and have helped to develop some running shoes. I've also optimized my diet and sleep. I see my body as my "system." It's like a vehicle that has to bring its full horsepower to bear at the crucial moment, and for that it needs the perfect fuel, of course.

Dr. Stefan Wolf: Nothing is static; everything is dynamic. That's the case in sport, in a company, and in all walks of life. Something that's not moving will lose out one day – because it's not developing any further. And that brings us back to motivation. There are some people who are skeptical about change because they think like this: "But we've spent decades doing things in this tried-and-tested way, and it's been successful – who says those days are over now?" You could easily have thought the same, Ms. Burghardt, couldn't you, when your new coach questioned your running technique. In a company, it's a question of taking people on your journey with you, making it clear to everyone that we'll only achieve our common aims through change. Your goal is a time under 11 seconds. Ours at our company is sustainable growth with the aid of technologies that are helping to shape climate-friendly mobility.

Alexandra Burghardt: A key aspect of my own change journey was to draw inspiration from other sports and philosophies. For instance, I took some of my input from CrossFit. These new angles prevent you from staying still and always making the same mistakes rather than moving ever closer to that optimum state.

Ms. Burghardt, how did you come to be a pusher in a two-woman bob at the Winter Olympics – and win silver – alongside your sprint career?

Alexandra Burghardt: It's not a massive leap from being a sprinter to being a bobsleigh pusher, because both sports revolve around speed and acceleration. I'd already been asked whether I could see myself doing it but had said no, because I wanted to achieve my goals in athletics first without being overshadowed by the injury risk. When I then had my strongest year as a sprinter to date at the Tokyo Olympics in 2021, I was asked again.

Did you say yes on the spot?

Alexandra Burghardt: No [laughs]. This time, I was reluctant because, after all, I was doing so well in athletics at that moment that I didn't want to jeopardize how things were going. So you can see that there are always arguments against doing something. I slept on it, asked a few people for advice, and then decided that, actually, it was just the right time! I was going to try it out in order to achieve something that nobody had before, namely competing at a Summer and Winter Olympics within the space of a year. In other words, out of my comfort zone and off into the cold water!

Dr. Stefan Wolf: Taking what you can do and applying it to something else – we had a similar moment at our company. We've been a manufacturer of and market leader for cylinder-head gaskets for combustion engines for many years. These are thin metallic plates that are punched, embossed, heat-treated, and coated. The company made its first large batch of these gaskets in 1924, so almost 100 years ago, for the Opel Laubfrosch. Fans of vintage cars will know what I'm talking about. When it was clear a few years ago that electromobility was going to be the key issue of the future, we

» Every decision involves weighing up the opportunities against the risks.«

Dr. Stefan Wolf, CEO of ElringKlinger AG



faced the question of what was to become of our unrivaled expertise in manufacturing cylinder-head gaskets. So we had a think about what processes we used to make these sophisticated components. What did we do well? Punching, embossing, heat-treating, and coating. Were there any parts of a fuel cell that required this expertise? Yes, you needed metallic bipolar plates, whose manufacture calls for very similar knowledge. So we conquered this new terrain by taking what we already did better than anyone else could and transferring it to another product. Not that there wasn't any resistance or skepticism from within the company. But we managed it nevertheless.

Alexandra Burghardt: Having a plan – and then seeing it through, even in the face of resistance: that's the secret to success. My decision to take up winter sports alongside my sprinting also met with criticism. But after that decision was made, I asserted myself. And it worked.



Alexandra Burghardt was born in Mühldorf am Inn in 1994 and has been one of Germany's top female sprinters since the mid-2010s. After changing coaches in 2019, she broke into the world's elite. Having competed at the Summer Olympics in Tokyo in 2021, she went on to take part in the 2022 Beijing Winter Olympics half a year later, where she won silver as pusher in the two-woman bobsleigh alongside pilot Mariama Jamanka. Another half a year down the line, she celebrated her biggest success on the running track to date: a fantastic gold medal in the 4 x 100 meter relay at the European Championships in Munich in her home country. The six-time German champion has a personal best over 100 meters of 11.01 seconds. Her big ambition: to run under 11 seconds.

» I see my body as my 'system.' It's like a vehicle that has to bring its full horsepower to bear at the crucial moment. «

Alexandra Burghardt, sprinter and pusher in the two-woman bobsleigh

Dr. Stefan Wolf: Every decision involves weighing up the opportunities against the risks. Whether you're an elite athlete or running a company. Ultimately, you have to make your own decision and then stick to it. Whether this decision will ultimately lead to success or not will be revealed in the numbers – in business as in sport. Sometimes they're good, other times less so. But if you look at our overall track records, Ms. Burghardt, then you as a high-performance sportswoman and we as a company are going along very well.


Ms. Burghardt, has your bobsleigh career even made you a better sprinter?

Alexandra Burghardt: My bobsleigh career has definitely made me richer, by which I mean richer in experience, in emotions, in friendships, and in empathy – as well as in manual dexterity. This is because you have to do a lot more of your own tinkering on

the sled than you might think. The Allen wrench was my constant companion [laughs]. After all, not for nothing do people talk about a "wealth" of experience. When I'm standing on the track next to the seven other runners, I sometimes do find myself thinking, "Thanks to bobsledding, I've had the opportunity to learn and experience things you know nothing about."

Dr. Stefan Wolf: Yes, the transfer is the most important thing. You have to take your experience and expertise, i. e., the good aspects, from one world and deploy them as a strength in the other. That then forms the basis for the competitive edge you can carve out for yourself. Ultimately, it's no different for us in the automotive sector.

The interview was conducted by André Boße



Digital transformation is everywhere, affecting virtually all areas of our lives. Essentially, it means stepping up our use of IT and harnessing global connectivity in order to make processes more efficient and effective on an ongoing basis. It is about how people and organizations work, interact, and adapt and how this can generate additional value. As far as ElringKlinger is concerned, the digital transformation holds one of the keys to the future. Corporate culture and digitalization go hand in hand and are closely intertwined. At the heart of this transformation are ElringKlinger's employees, who are shaping this change.

SMART

The onward march of digitalization is not only confined to people's homes: companies, too, are increasingly realizing the omnipresence of the digital transformation. The market and customers alike have their sights set on integrated digital solutions, and ElringKlinger sees this as an opportunity to create value by leveraging digitalization. The digital transformation is thus contributing to the company's growth through a comprehensive and consistent data strategy. For this reason, ElringKlinger has made the conscious decision to shape digital change successfully and accelerate it proactively as part of a holistic transformation process.

With digital habits and the possibilities afforded by technology both changing rapidly, companies are adapting in order to stay competitive. ElringKlinger is embracing this change and making it part of its fabric. The digital transformation is one of the factors that will play a key part in delivering its corporate strategy and thus for its future success as a company.

The crucial element of added value that the digital transformation is bringing to the Group is the establishment of a digital process and system landscape aligned with the industry benchmark. At the start of its transformation process, the company matured it was and asked itself what level it wanted to be at in the future. This is the only way to exploit the potential and opportunities offered by the digital revolution to the full. ElringKlinger is thus forging its own path of transformation rather than copying competitors and adding these elements into its existing

COMPANY

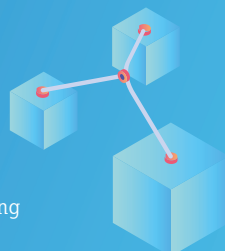
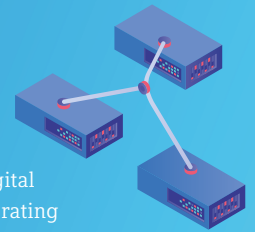
IT landscape. The Group is pressing on with making lasting improvements to its own digital architecture and is accelerating this process with the help of its employees.

It will only be able to achieve the digital transformation – part of its corporate strategy – and the objectives and targets derived from it if the necessary systems, processes, and personnel are given the appropriate capabilities. Since employees and their skills will be the main catalysts of this transformation, they must be empowered to tackle it when it comes and thus shape the future of ElringKlinger.

A market-leading standard

A dedicated unit for the digital transformation has been set up to coordinate the process from a central base. This organizational approach ensures that all areas of the company are involved and a link is forged between the IT and business sides. In this organizational structure, all activities across the company are planned with the objective of bringing all the staff with operational responsibility for the process together in an interdisciplinary team in order to drive digitalization forward in an integrated way.

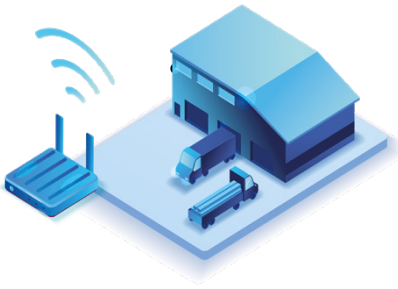
ElringKlinger has adopted a platform-driven approach to its digitalization. This means it has set up digital business platforms to keep its process and system landscape at a leading market standard; at the same time, it is using real-time, user-centered information for smart enablement. The focus is also on empowering staff at all levels to use new digital tools and methods. ElringKlinger is working toward



an architecture that will allow it to map all its requirements from day-to-day business and customer demand as digital

ElringKlinger uses digital technologies to work more efficiently and resource-saving.

twins in production, and Group sustainability.



A holistic roadmap

The digital transformation is continuing apace. ElringKlinger is evolving at the same speed and is even pulling ahead with its holistic strategy. In this context, systems, processes, and data structures are being scrutinized across the company, in addition to being newly introduced and implemented accordingly. This transformation process is founded on the creation of a holistic roadmap, which is creating transparency and ensuring that everyone throughout the Group is working on the right things. The roadmap guarantees that the internal development steps are given the right priorities for investing in the digital transformation in a targeted way.

The Group-wide digitalization roadmap is making a significant value contribution to the company. The interdependencies between systems, data, and processes are classified and prioritized on the roadmap with the aim of eliminating interface problems so that work on the common target architecture can proceed in a structured fashion. Digitalization is also creating value in that tasks that can only be performed with significant manual effort at present, if at all, can be mapped more easily. As a basic principle, the digital transformation will not mean any changes to ElringKlinger’s products in a first step. However, digitalization will help the company to



In focus

ARTIFICIAL INTELLIGENCE & ANALYTICS

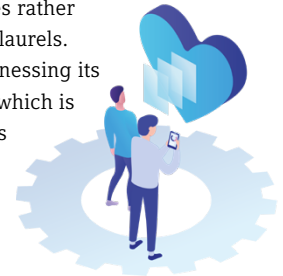
These lie at the heart of the digital transformation, because processes and forecasts are set to become increasingly efficient and entire workflow structures will change for good. Artificial intelligence (AI) is everywhere at the moment and is already making its presence felt in the home in particular (voice control, smart-home solutions). However, AI is gradually finding its way into the corporate world of work too. Instead of individual execution and calculation steps being programmed by human beings, an AI system learns how to adapt to changes in its surroundings itself. Essentially, it uses image, noise, and touch sensors to generate information to help it “perceive” things. Rather than developing human skills, however, what AI actually does is quickly process vast amounts of data that a human being could never manage in such a short space of time. An AI system can therefore outperform a human in many areas – although it will usually be specialized in a single core function. Ever-increasing volumes of data allow AI to be optimized on an ongoing basis.



develop new ones faster, spot market trends more successfully, and make production processes more efficient. Structuring its data in an integrated way will enable the Group to embrace new trends in technology such as artificial intelligence.

People as a success factor

One of ElringKlinger’s hallmarks has always been how it puts its employees front and center. Yet the world of work has undergone continual change and upheaval in the 140 years the company has been in business. The coronavirus pandemic, in particular, showed ElringKlinger’s ability to transform itself by introducing extensive flexibility measures to promote mobile working. This adaptability is a key factor in the digital transformation. Rather than shunning new approaches, therefore, the company has realized how important it is to think in new ways and keep on setting new objectives rather than resting on your laurels. And the Group is harnessing its technological focus, which is already strong, to this end. It is not just IT that is undergoing a transformation,



As well as the product- and process-related changes that are on the agenda, the key player in all of this is the human being, in this case the people who work for ElringKlinger.

however. Rather, the transformation is making its presence felt in other aspects of the company too, such as its development, culture, and processes. As well as the product- and process-related changes that are on the agenda, the key player in

all of this is the human being, in this case the people who work for ElringKlinger.

In the digital world of work too, it is the employees – their talents, their skills, and their dedication – that make the difference. It is primarily a case of getting to grips with new situations more easily and being able to analyze and solve problems better in an increasingly complex (working) world. Companies will only remain fit for the future if they can successfully combine technical knowledge, basic digital literacy, and interdisciplinary expertise. Investments in staff training and development are thus key to success in times of ever-fiercer competition and the pressure to innovate.

One of the key elements is therefore not only to take your employees along with you on your digitalization journey but also to empower them to deliver digitalization themselves. Strategies for teaching new methods as well as new approaches to collaboration will gear staff up for the transformation process and equip them with methods that will take them – and thus ElringKlinger as well – to the next level. For ElringKlinger, the way ahead is clear – without investing in its personnel, perhaps the biggest transformation in the world of work since the Industrial Revolution simply cannot be achieved.

The digital transformation demonstrates more than ever how people are at the heart of ElringKlinger. Although it may be possible to introduce new systems and methods into the company, they will be doomed to fail without the employees to act as the linchpin. The objectives set as part of the digital transformation can only be achieved with highly skilled, highly motivated staff.

Digitalization and corporate culture

Together with its corporate culture, digitalization will be one of the elements contributing to the future success of the ElringKlinger Group. The two success factors both influence and are dependent on each other. The corporate culture is

Digitalization requires a corporate culture that is open to change in order to successfully manage the transformation.



Digital twins are virtual representations of products, machines, or processes that contain all the relevant data and simulation models – be this for a factory, a product such as a fuel cell, or an entire value chain. As well as enabling products to be designed, simulated, and manufactured faster, digital twins also make it possible to design them to be particularly inexpensive, powerful, robust, or environmentally friendly, depending on your requirements. Acting like a digital shadow, this virtual doppelgänger can also accompany a product through all the stages of its value chain, from production and operation through to servicing or even recycling.

primarily shaped by the behavior of the people working in the company and their diverse internal and external interactions. Therefore, a successful digital transformation also requires a development of the employees' behavior and also of the corporate culture. Successful transformation of the Group requires in particular a proactive approach to change and openness to new processes and ways of working across the organization. Especially, the fundamental ability to deal successfully with change is a future feature of corporate culture with high significance. This includes, for example, dealing openly with mistakes and accepting failure early on when new paths have to be taken. Digitalization requires a corporate culture that is open to change in order to successfully manage the transformation. Corporate culture and digital transformation must go hand in hand and work closely together if they are to be successful.

Change cannot be done with the click of a mouse. Instead, communication and collaboration are called for in order to tackle it. This is what the digital transformation means: making change and transition an integral part of the company. This is the challenge that digitalization brings as a way of supporting the corporate strategy. Instead of a one-off or short-term project, the digital transformation is an issue that will stay with the Group permanently in the future. ElringKlinger is working proactively to drive the transformation process forward and accelerate it through its own efforts in order to make a valuable contribution to the sustainable mobility of tomorrow through digitalization.

ALL ROADS LEAD TO SUZHOU



An aerial photograph of Suzhou, China, during sunset. The sky is a mix of orange, pink, and blue. In the foreground, a river flows through the city, with a modern building complex and a marina with several boats docked. The middle ground is dominated by a cluster of tall, modern glass skyscrapers that reflect the golden light of the setting sun. In the background, more residential and commercial buildings are visible, along with distant hills.

Formerly a place for traders and craftspeople, now a center for the high-tech industry: this is the Chinese city of Suzhou, home to several million people and, since 2022, a new site for EKPO Fuel Cell Technologies GmbH (EKPO). Located a stone's throw from Shanghai, the site is set to play a key role spearheading the joint venture's strategic growth plans. It intends to use Suzhou as a springboard for rolling out its leading fuel cell technology to Asia's fast-growing markets.

With its many canals criss-crossing the city, Suzhou is also known as the Venice of the East. While what was once the most important trading center for Europeans is now a tourist attraction, the modern industrial metropolis in eastern China is pulsating with life. Situated in one of the world's most attractive economic regions a mere 100 kilometers to the west of Shanghai, the city is a major hub. These unique infrastructural conditions have led more than 2,000 companies from all over the world to make the move to Suzhou New District, with EKPO Fuel Cell Technologies GmbH (EKPO) doing likewise in 2022. Establishing the subsidiary EKPO China at its Suzhou site is the key step toward cultivating the Asian fuel cell market.

Asia – a growth market

The reasons for such an expansion are obvious, as Asia's hydrogen industry is growing ever faster. The development of infrastructure for producing, storing, transporting, and using hydrogen is being followed by the creation of regional and international business ecosystems. In this context, the Asian market is of global significance. Nowhere in the world is demand for energy more buoyant, and nowhere are currently larger volumes of fossil fuels being consumed at the moment than in the far east.

Building a hydrogen-based economy is of strategic importance to China for **decarbonization**. As an industrial center, China has immense energy needs. At the same time, urban regions are severely affected by environmental pollution. Therefore, the country wants its CO₂ emissions to have peaked by the end

The powerful fuel cell stacks from EKPO are an important component for CO₂-neutral mobility – on the road, rail, on water or off-road.

of the decade and is aiming to achieve climate neutrality by 2060. China is the leading region in Asia in the field of fuel cell technology. Driven by climate, energy, and industry policy targets, hydrogen and fuel cell applications are being developed and promoted in the country as key technologies of the future. One particular area of focus is the mobility sector, where fuel cell vehicles, just like battery-electric vehicles, are classed as new-energy vehicles (NEVs) and given equivalent support. To this end, the government has launched an extensive support program in which

the value chain for fuel cell vehicles has an important role to play. Besides China, highly promising growth markets can also be found in Japan, South Korea, and India, where more and more state-backed hydrogen and fuel cell schemes are launched that are making a major contribution to supplying green energy.

The growth prospects open to EKPO with its cutting-edge technology present a attractive opportunity that the company intends to seize in order to become a key player in China's fuel cell industry. EKPO is a joint venture between two established international automotive suppliers, ElringKlinger and Plastic Omnium. It has operated in China ever since it was formed in 2021 and is able to draw on the existing infrastructure of its two parent companies in doing so. Investing in the Suzhou site and establishing EKPO's Chinese subsidiary are the first two building blocks in a long-term strategy.

250_{kw}

The fuel cell test bench can handle stacks up to 150 kilowatts and will be upgraded to handle 250 kilowatts by the midpoint of the year.

The fuel cell test laboratory meets the same standards as the test benches at the company's headquarters in Dettingen/Erms, Germany.



**EKPO China
is located in
the Suzhou
New District
Industrial Park.**



ELRINGKLINGER IN SUZHOU

ElringKlinger has had a presence in China since as long ago as 1993. Whereas only cylinder head and specialty gaskets were manufactured there in the first few years, virtually the whole product range is covered nowadays. Suzhou has been among ElringKlinger's 46 global sites since 2008, with the company constructing its first buildings there as early as 2009. However, the rapid growth of the Chinese automotive market forced the company to relocate and expand its capacity. A state-of-the-art plant was built on a site measuring some 67,000 square meters and located 27 kilometers from its predecessor.

ElringKlinger's Suzhou site was expanded by good 30,000 square meters in 2016, most of which was new production space. There is also local capacity for research and development in Suzhou. Offices, conference rooms, a canteen, and communal areas are housed in an additional 7,000 square meters. There are currently more than 350 people working for the ElringKlinger Group in Suzhou.

Local expertise

The first step toward expansion in Suzhou came at the start of 2022 and involved investing CNY 15 million (around EUR 2 million) in a 1,000-square-meter testing facility and a hydrogen station. This fuel cell test bench can handle stacks up to 150 kW and will be upgraded to handle 250 kW by the midpoint of the year. The test lab for fuel cells meets the same quality standards as EKPO's test benches at the company headquarters in Dettingen/Erms, Germany to offer the highest quality of series-ready fuel cell solutions worldwide.

The second step was the official incorporation of the Chinese subsidiary, the formal legal process for which was completed in June. This will initially see the company invest several million euros in its Suzhou site, a logical move in order to ensure value creation at local level for fuel cell technology in China. The next milestone was met at the end of 2022, with the first fuel cell stacks made locally in Suzhou rolling off the production lines.

ABOUT EKPO FUEL CELL TECHNOLOGIES

EKPO Fuel Cell Technologies (EKPO), based in Dettingen/Erms (Germany), is a leading joint venture in the field of development and large-scale production of fuel cell stacks for CO₂-neutral mobility. The aim of the joint venture is to develop and mass-produce high-performance fuel cell stacks in order to further advance CO₂-neutral mobility – whether on the road, rail, water or off-road. EKPO's stacks meet the demands for a durable and compact design combined with high power density, offering the best combination currently available within the market.

Through its parent company ElringKlinger, EKPO has been actively pursuing fuel cell research and development for around 20 years. Already today EKPO has a production capacity of initially up to 10,000 stacks per year. 2022 the first international subsidiary EKPO China was founded at the Suzhou site.



The first fuel cell stacks have left the plant at the end of 2022.

EKPO China has full responsibility for the entire value chain, from product development, prototyping, and prototype testing through to manufacturing and supply chain management. As EKPO's second global site, Suzhou is key to the company's strategy for taking on the competition, as EKPO China General Manager Humphrey Chen explains: "The Asian and, in particular, Chinese market is well known for their fierce competition. It's vital to win over potential customers at a local level with your technology, expertise, and production capacity. Thanks to its Suzhou site, these are precisely the qualities that EKPO can offer to the Asian fuel cell market."

Making a key contribution to sustainable mobility

China is currently the world's fastest-growing market for fuel cell applications. As early as 2025, four times as many cars and commercial vehicles are set to be manufactured with a fuel cell drive than in 2020, and many automotive manufacturers have spent years gearing up for this. Even as soon as 2030, more than one million new vehicles with fuel cell drives could be registered in China according to a forecast by the China Society of Automotive Engineers. Thanks to its market-leading stack technology, the company has some powerful products for this sales region in its ar-

mory that will allow it to make a decisive contribution to **sustainable mobility** in the world's biggest automotive market. Being able to participate in the growth of the fuel cell segment hinges on offering Chinese customers solutions that are also produced in China.

Sustainable mobility means for ElringKlinger in particular through emission-free technologies actively contribute to climate protection.

» It's vital to win over potential customers at a local level with your technology, expertise, and production capacity. Thanks to its Suzhou site, these are precisely the qualities that EKPO can offer to the Asian fuel cell market.«

Humphrey Chen, Managing Director EKPO China

EKPO's environmentally friendly drive solution has met with great interest. Back in 2022, the NM5-EVO fuel cell stack powered the shuttles used at the Beijing Winter Olympics, where they demonstrated good cold-start properties even at very low temperatures. The company is currently still in the commercialization phase. The first customer projects set to enter series production in the near future. EKPO's stacks are primarily in demand for passenger cars, vans and transporters, buses, and trucks.

Looking ahead with confidence

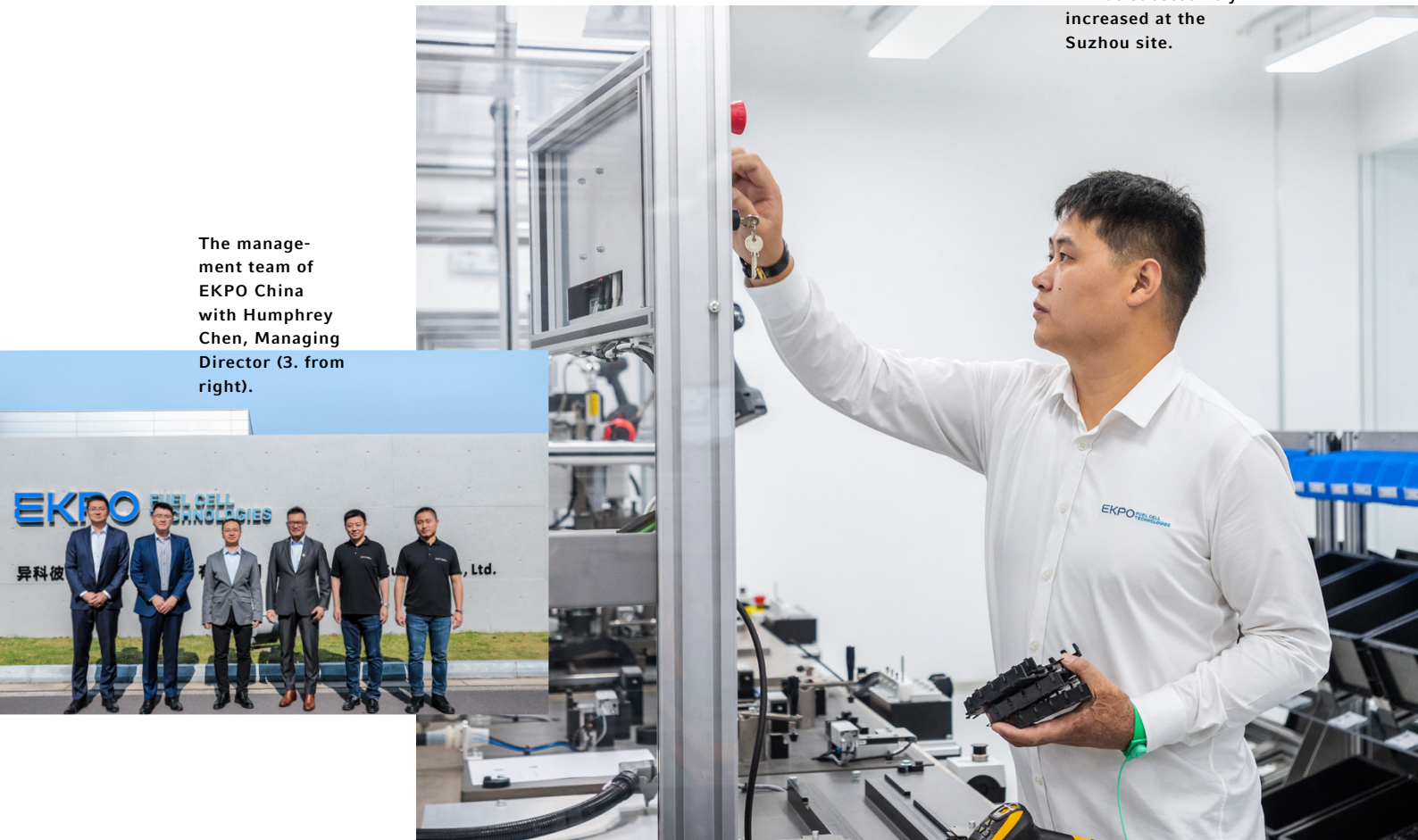
EKPO will gradually expand its business activities in China, which it sees as one market with great potential for the future. The next stages of expansion will see the vertical integration of fuel cell production in Suzhou gradually increased in order to manufacture

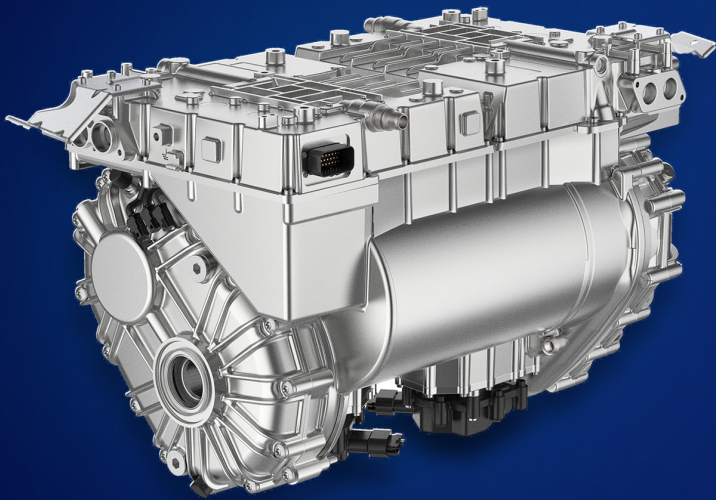
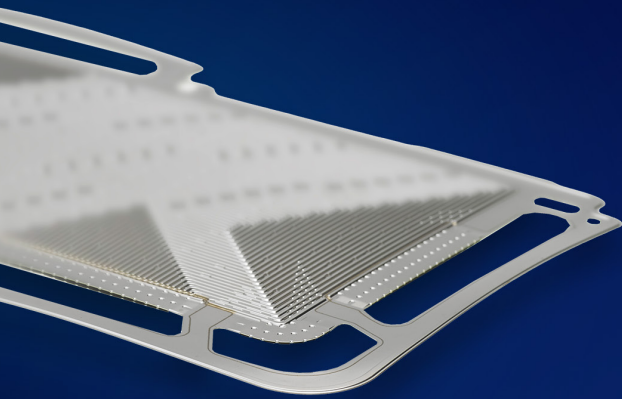
components as well as stacks. Local production will also be ramped up step by step, and a local service organization will be created so as to guarantee fast response times and customizations at the highest possible technical level. Last but not least, local supply chain management will remain a priority at all times as a way of optimizing the costs of the product portfolio over the long term.

Humphrey Chen is confident about the company's medium-term future: "From its base in Suzhou, EKPO China will bring its market-leading fuel cell technology to the Asian market so that it can actively drive forward the decarbonization of the mobility sector. We firmly believe that, if we at EKPO keep on working hard and put our innovative strength to good use, we'll see our strategic plans through successfully and play a key role in China's fuel cell industry."

The vertical range of manufacture for fuel cell production will be successively increased at the Suzhou site.

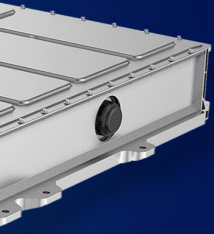
The management team of EKPO China with Humphrey Chen, Managing Director (3. from right).





The ElringKlinger Group's portfolio within the area of electromobility encompasses both system and modular solutions as well as individual components, such as battery storage units, bipolar plates, or electric drive units.

Mobility is changing. Success in this transformation will be reserved solely for the company that gears itself up for this change across the board and sets clear paths toward the future. The Fifth Industrial Revolution – Industry 5.0 – that awaits us will be all about linking human and digital intelligence, about sustainability, and about resilience. With its own winning factors, ElringKlinger has clearly set a course for shaping this transformation successfully.



The transformation

When we climb into the car of tomorrow, mobility will look different to how it does today. The world is changing. Let's take the past as our benchmark. Can you still remember? We used to operate the "choke" to coax the engine into life during a cold start. Electric windows were just as much a sign of pure luxury as central locking. Seatbelts were initially seen as a constraint, not a safety feature.

The transformation has become noticeably faster. The next few years will see much more far-reaching changes than those of the past, and more quickly too. Most people expect transport to be more interconnected. This would also enable autonomous vehicles to fuse private with public transport by putting needs and opportunities on an equal footing. Robot taxis will ferry people around in small groups and drop each of them off at their chosen destination. However, the most important step in this direction began a long time ago. It involves the vehicle's drive: climate-neutral technologies will dominate the vehicle markets – initially concentrated in certain

regions and for specific applications. Going further forward, however, more factors will come into play. The key words here will be sector coupling and charging and hydrogen infrastructure – plus the willingness of the markets to keep on embracing the new drives together with all their ramifications.

Ten years ago, new drive technologies were still seen as something of a peripheral phenomenon. Even as recently as five years ago, only one in 17 new vehicles rolling off the global production lines was fitted with a hybrid, battery, or fuel cell drive. By 2022, this had increased to as many as one in four. ElringKlinger was quick to commit itself to these new technologies and became a series supplier for battery components as early as 10 years ago. For fuel cells, meanwhile, the Group actually began developing its initial expertise 20 years ago. This meant that, rather than having to find its way into the process of transformation, ElringKlinger has actually been contributing know-how, expertise, product solutions, and production techniques as a series manufacturer for many years.

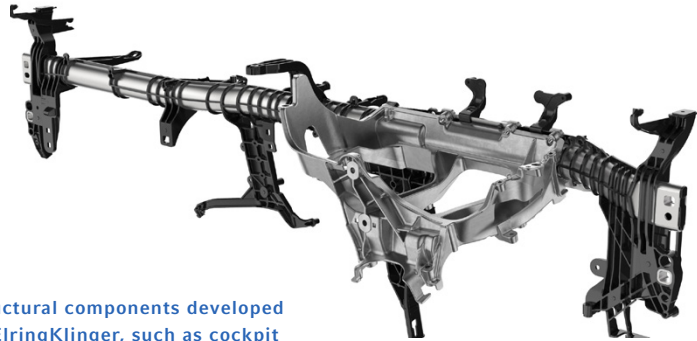
By embarking on its own transformation early, ElringKlinger is not only relying on leveraging its strong market position for combustion engine components but is also pursuing two more key strategic paths.

First, the Group's original, traditional business units have used their skills in combustion engine technology to come up with new solutions for electromobility applications. With its disk carrier, for example, the Metal Sealing Systems & Drivetrain Components business unit – which also includes cylinder-head gaskets – has brought a product to series manufacture for a battery-electric vehicle model of a European manufacturer. However, the business unit will also bring its metalworking expertise to bear for rotor and stator solutions in electric motors in the future. This is all part of ElringKlinger's DNA: identifying new areas in which the Group's expertise and strengths can be harnessed in order to add value through innovative solutions.

Carbon dioxide is released by vehicles burning fossil fuels, which contributes to climate change.

50%

In addition to withstanding high mechanical loads, disk carriers also boast up to 50% less weight compared to standard market solutions.



Structural components developed by ElringKlinger, such as cockpit cross-car beams, feature an excellent performance-to-weight ratio, load path-based design, and outstanding capabilities when it comes to functional integration.

Over the past few years, the Lightweighting/Elastomer Technology business unit has already begun to generate an increasing percentage of its revenue from products that are fitted inside latest-generation vehicles. One good example is the cockpit cross-car beam. Originally developed in collaboration with a German premium manufacturer for vehicles powered by a combustion engine, the cross-car beam was able to reduce their fuel consumption and thus their carbon emissions as well by achieving a significant weight reduction compared to the prevailing technology of the time.

As well as with combustion engines, however, the cross-car beam also proved a success with electric drives, where the lower weight increases a vehicle's range. The cockpit cross-car beam has since been optimized for several manufacturers and is now being mass-produced. But that is not all in terms of looking to the future: the business unit is also supplying electric-vehicle manufacturers with metal-elastomer gaskets for their batteries. Overall, a significant proportion of the business unit's revenue is already being generated in connection with the mobility of the future.

The Group's second strategic path is heading firmly toward the new technologies. With its metallic bipolar plate and stacks, the Group is able to offer powerful solutions

for fuel cells. The Group has been forging this path successfully since 2021 together with the French automotive supplier Plastic Omnium. EKPO Fuel Cell Technologies, a company in which both partners hold ownership interests, boasts a number of impressive attributes, not least the market-leading performance density of its stacks and its expertise in industrial-scale production. Specifically, these stacks achieve values of 6.2 kW/l inside the cell block. What is more, the company has already achieved an initial production capacity of up to 10,000 units a year. It gained a foothold in China in 2022 with the establishment of a subsidiary there.

As it has with fuel cells, ElringKlinger has also used its knowledge to unlock innovations in the field of battery technology. The Group began its journey down this road at an early stage: the cell contact system – as crucial a component for a battery system as the cylinder-head gasket is for the combustion engine – entered series production as long ago as 2012. An order for series production from a global battery manufacturer, who will be incorporating the cell contact system into the new platform designed by a European manufacturer, is currently getting under way. While building up its expertise in the series production of components, the Group has also broadened its knowledge base and can now supply modules and complete systems as well.

Mobility is changing, and ElringKlinger has already laid ideal foundations for succeeding with the mobility of the future through its innovative product range.

In addition, ElringKlinger has incorporated its mass-production expertise in the new technologies into its partnership with hofer powertrain. Whilst ElringKlinger has acquired a strategic non-controlling interest in the parent company hofer AG, the joint production subsidiaries are fully consolidated in the Group in its capacity as majority shareholder. The sophisticated electric drive units manufactured there are intended primarily for the high-end sport and luxury car segment, with series production already under way at the UK site.

However, the Group's products and its decision to focus on innovation from an early stage are not the only success factors that are helping ElringKlinger to shape the process of transformation. Besides its forward-looking product portfolio, the Group's positioning for future growth also has a lot to do with digitalization and process orientation, which is leveraging efficiency savings and generating added value. After all, it is clear that a digital company ecosystem is a necessary condition in order to be fit for the future. The sufficient condition, however, is the human factor. In order to be successful in tomorrow's economic world – also referred to as the Fifth Industrial Revolution – a company will need to fuse smart machines with the people who work for it. This includes a healthy corporate culture in which diversity, respect, and equality all play a role as well as a corporate group that is on a sustainable footing. But "sustainable" here is not restricted to the environmental sense. Needless to say, it includes climate-friendly production and choosing suppliers who work in line with the UN's sustainability criteria. In this context, however, it is also about the value of work for employees, about a clear and transparent

corporate structure, about business integrity, and, last but not least, about a company's **responsibility to society**. Ultimately, a corporate group will not only be sustainable by acting in this way but will also give itself the resilience it needs to cope with a diverse range of external influences.

For ElringKlinger, therefore, "transformation" has both an external and an internal side. Mobility is changing, and



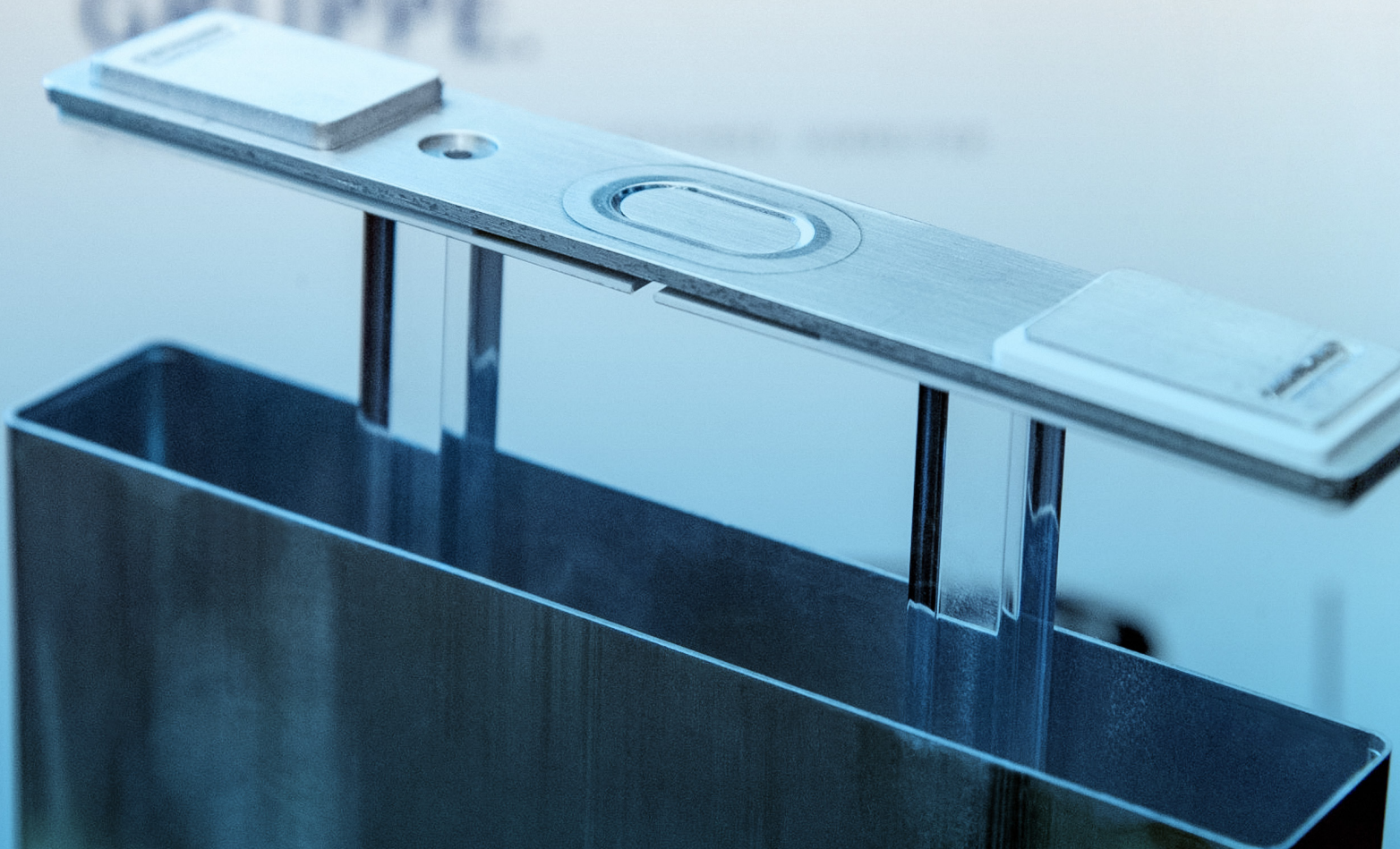
205 kWel

EKPO fuel cell stacks achieve an output of up to 205 kWel.

In an effort to act sustainably, companies must see themselves as an integral part of society.

ElringKlinger has already laid ideal foundations for succeeding with the mobility of the future through its innovative product range. At the same time, it is following some clearly signposted paths in order to create the internal structures that are essential to carving out a successful position. With the help of its employees, therefore, the EUR 3 billion in revenue that ElringKlinger is targeting for 2030 is the logical consequence of this.

DIE ELRINGKLINGER-GRUPPE.



The cell cover ensures that power is transmitted into and out of the cell via its poles. Together with the cell cup, the cell cover encloses the battery cell.

»MADE IN EUROPE«

ElringKlinger is part of a major international project to build a value chain for the European battery industry. The aim of creating a battery “made in Europe” is to improve competitiveness and skills in the EU, drive forward sustainability, and reduce dependence on non-member states. Highly innovative technologies and techniques that go beyond the current state of the art are being funded as part of the battery IPCEIs (Important Projects of Common European Interest).

Asia is the dominant player on the scene, with the ten largest manufacturers of automotive battery storage systems being Asian companies. Between them, they held a market share of over 90% in 2022 according to the South Korean market research institute SNE Research. This figure alone highlights how dependent the automotive industry is on the region for its electric-vehicle batteries. Not only the economic fallout from the coronavirus pandemic but also shifts in the geopolitical landscape are increasingly pushing issues such as the resilience of supply chains and dependencies in the case of critical raw materials to the forefront of public debate.

European companies also have the expertise required to build batteries for electric cars, yet not one of them is among the world’s biggest battery manufacturers. So how can one go about ensuring that Europe, too, has a value chain in place for this key technology of the future? The large-scale IPCEIs are designed to develop core technologies such as semiconductor, battery, and fuel cell technology on the European continent, while the two battery IPCEIs are also aiming to reduce dependency and improve security of supply.

The European Commission approved the second IPCEI for battery technology in 2021. This project, entitled “European Battery Innovation” (or “EuBatIn” for short), is being coordinated by Germany and will see a total of 12 EU countries contribute up to EUR 2.9 billion to the development of a European battery value chain. ElringKlinger is one of only 13 German companies to obtain funding of this kind as part of the EuBatIn program. This major international funding project is geared toward building a closed, sustainable, and innovative value chain for lithium-ion battery technology in the EU. It has deliberately adopted a holistic approach that encompasses the entire value chain: from obtaining and producing the materials, manufacturing the cells, and assembling the modules and systems right through to creating the product and recycling it.

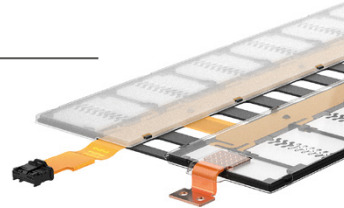
ElringKlinger is also involved in this IPCEI and has been awarded funding totaling EUR 33.8 million for an innovative battery cell housing design to be provided by the German Federal Ministry for Economic Affairs and Energy and the state of Baden-Württemberg by the end of 2026. One unique feature of the IPCEI program is that the funding will also support the journey to series production, thus extending well beyond the scope of many other funding schemes. In order to secure its funding, ElringKlinger had to ensure that its proposed project and the related processes met various requirements. That was not all, however: a particularly innovative technical approach was also required in order to stand out.

40%

The reduction in the amount of manufacturing work and materials required shrinks the product's carbon footprint by some 40%.



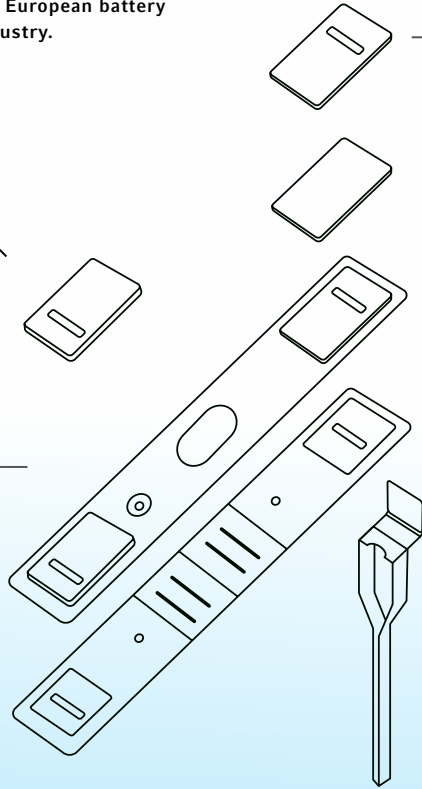
With an innovative cell housing design, EtringKlinger is helping to create a value chain for the European battery industry.



A cell contacting system, which carries the electrical current, is placed and welded on the cell cover's "terminal."

1/4

The design of the battery cell housing allows less complex components to be used and reduces the need for energy-intensive raw materials such as aluminum and copper. Specifically, up to 25% fewer components need now be used thanks to the design.



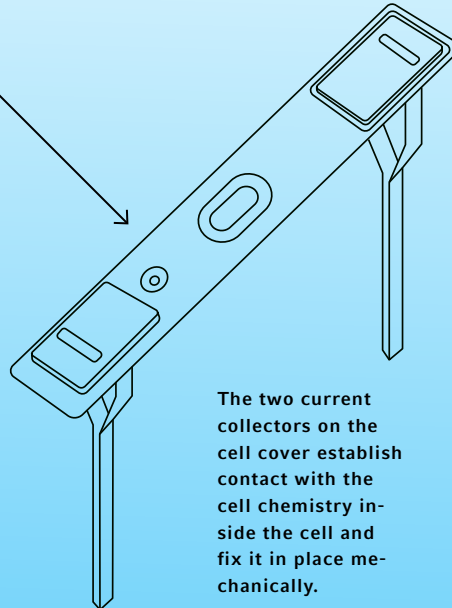
Protecting against excessive temperatures: a vent on the top of the cell cover allows heat to be dissipated in a targeted manner.



15%

With fewer components and a more efficient assembly line, the reject rate is now much lower.

The two current collectors on the cell cover establish contact with the cell chemistry inside the cell and fix it in place mechanically.



As its name suggests, the second battery IPCEI – “EuBatIn” – is very much about innovation. With this in mind, the engineers at ElringKlinger focused specifically on furthering the development of

its battery cell cover, a vital component of the **battery cell**. Their development efforts produced a cell cover design that, in technical terms, outperforms current sealing components in many respects. The members of ElringKlinger’s battery technology team at its Neuffen site are working on the component in a project officially entitled “Entwicklung und Industrialisierung eines innovativen Batteriezellgehäusedesigns für verschiedene Zellformate” (i. e., the development and industrialization of an innovative battery cell

housing design for various cell formats). The Group developed the innovative cell cover for use on both prismatic and cylindrical (round) cells. ElringKlinger’s engineers began tackling the cell housing right from an early stage, because it is on the cover, i. e., the lid, that another key component is placed and welded – the cell contacting system, which carries the electrical current and monitors voltage and temperature. The Group is putting its expertise in metal forming and punching technology to good use in the production of the metallic cell connectors that are fitted inside the cell contacting system. ElringKlinger has been mass-producing cell contacting systems and supplying them to customers for over ten years now. The series production of cell contacting systems is another element in the Group’s ongoing transformation.

But back to the cell housing. As the diagram to the left shows, the two current collectors are fed through several openings before being welded to the “terminal” when the cell housing cover is fitted. An innovative sealant containing casting compound is used for this purpose, while the geometries of the individual parts have also been simplified considerably. The developers have thus saved on costly and resource-intensive components as well as reducing the number of welding operations required on the cell cover by 75%. Before they had even finished writing their first proposal, the members of the project team were confident that this relatively small component would definitely be able to achieve great things. Ultimately, the design also paves the way for a more streamlined production concept with far fewer production steps.

The cover of a cell housing has to meet many different requirements in the product specifications – perfectly. Insulating and connecting are two of the key functions that ensure, for example, that humidity (from outside) and the cell chemistry (on the inside) cannot react with each other. At the same time, electrical energy has to be supplied and conducted away via the cell poles. For this, a direct connection is established between the two current collectors on the cell cover, made from aluminum and copper, and the cell chemistry – the active part of the cell. The current collectors also come into contact with the cell chemistry and fix it in place inside the cell. However, there are other safety-related tasks that the cell cover has to master too: as well as shielding the cell chemistry from external influences (such as air and moisture), it also has to make sure that the environment is protected against the hazardous components inside the cell. In addition, the vent on top of the cell cover gives the cell a form of self-protection should it overheat or expand excessively, for instance.

Electrifying

Market forecasts by S&P Global Mobility suggest that over half the passenger cars and light commercial vehicles produced in Europe in 2029 will be battery-electric ones.

» We’ve been able to do away with up to a quarter of the components. With fewer parts and an efficient production concept, the reject rate is also much lower.«

Gunnar Deichmann, Vice President Battery Technology

ElringKlinger’s innovative cell cover is also a boon for sustainability in several respects. First of all, its design enables up to 25% fewer components to be used. Besides being expensive, the components that are no longer needed also use up a lot of material and energy. The product’s carbon footprint can be shrunk by around 40% in total, mainly thanks to the simpler production process – which uses only a quarter of the welding operations that used to be required – and the improved product design. The funding program is also facilitating progress on the sustainability front at an overarching, European level. The efforts to build a battery value chain in Europe are most definitely also linked to a desire to create new jobs on the continent in this highly attractive segment, ranging from the raw material through to production and recycling. There are over 40 companies from 12 EU member states working on the future of the European battery in four “workstreams.” A conscious decision has been made to integrate **battery recycling** into the framework for this holistically minded funding program, with a dedicated workstream – “Recycling and Sustainability” – devoted to exploring efficient recycling solutions. One of the stated aims is to ensure a circular flow of materials and thus reduce battery manufacturers’ dependence on access to critical raw materials. Sustainability also plays a role in the context of human rights, e.g., in the mining and extraction of raw materials.

One of the four workstreams of “EuBatIn,” as the battery IPCEI is known, is focusing on “recycling and sustainability”.

Besides the two battery IPCEIs, there are five other IPCEI projects in areas such as microelectronics, fuel cell technology, and next-generation cloud infrastructure. Some of these seven IPCEIs have already been signed off by the European Commission, while others are still being assessed. The IPCEIs give Europe’s policymakers a tool in their armory that they can use – and indeed are using – in the global competition for investment in key technologies.

Challenge accepted!

ElringKlinger has a clear vision for the future and its eye firmly on its goals. But multifarious challenges lie in wait, which the Group will be tackling with flexible, forward-looking action. Below you can find out how ElringKlinger is responding to ongoing change.

2022 has already been called the “year of multiple crises” by many, and widespread conflict and upheaval are shaping current global events. This is posing major challenges for politicians and businesses alike. The incredibly tough environment is requiring companies to show significant flexibility and resilience in order to navigate it successfully. Three of the biggest challenges for the automotive industry over the past year have been skyrocketing material prices, liquidity along the supply chains, and numerous bottlenecks affecting components and commodities.

How is ElringKlinger responding to these challenges? We asked members of the Management Board and senior Group figures about material prices, supply chain finance, and energy and transportation. Their interviews provide some real-life insights into how ElringKlinger is meeting the challenges with prudent planning and organization. They shed a light on some of the successful measures taken but also take a critical look at some of the complex issues that will be on the company’s agenda in the future. Find out first-hand how ElringKlinger is addressing the manifold challenges and how it will ultimately overcome them.

Pascal Stoll, Vice President Purchasing, talks to us about material prices. Together, we take a look at recent price trends – some of which have been extreme – and how ElringKlinger is responding to them in its procurement activities.

Thomas Jessulat, Chief Financial Officer (CFO) at ElringKlinger, explains in his interview how reverse factoring works, how the Group is using such an arrangement to improve its supply chain liquidity, and how this is creating added value for both ElringKlinger and its suppliers.

With regard to the challenges involved in buying energy and transportation services, Bernd Weckenmann, Vice President Procurement & Supply Chain Management, discusses the most important developments and explains how ElringKlinger is reacting to market movements.

Pascal Stoll,
Vice President
Purchasing,
ElringKlinger AG



01

Material prices

In view of the high and continually fluctuating material prices, how would you sum up 2022?

Stoll: “Challenging and stormy” would be a good description of 2022. We were faced with an unprecedented market situation last year that was reflected in raw material prices. That has persisted to this day. One particular challenge in the industry was delivery scheduling by manufacturers, which varied enormously in line with demand and thus caused uncertainty along the entire supply chain.

What other factors were there?

Stoll: And then there were the material shortages, some of which were still a hangover from Covid times, which were exacerbated further by the Ukraine crisis. Keeping supplies flowing was one of the biggest challenges that we overcame successfully. However, the record price hikes for key categories of materials, such as aluminum, nickel, and plastics, had an impact on our costs. The market price of aluminum and steel, for instance, hit an all-time high midway through the year. Meanwhile, the availability of plastics and elastomers became increasingly critical as the year went on, with bottlenecks persisting right up until the fourth quarter and prices rising continuously. And then you have the high energy prices, which are having an additional impact on the various categories of materials.

How did you tackle these adversities on the procurement front?

Stoll: We’ve identified several areas in which ElringKlinger can take action to improve its cost situation and are working rigorously to implement the measures we’ve agreed. For example, we’re carrying out regular index-based price analyses in order to identify unfavorable market trends early on and request price cuts at the right time. We’ve established a high level of transparency in pricing as early as the price negotiation stage. This allows us to identify potential reductions in costs and put them into effect. We’ve also been regularly examining whether certain single-sourcing situations are still the best option for ElringKlinger and whether we need to step up our dual-sourcing strategy. From a strategic perspective, it’s important that we work with our suppliers to come up with solutions that benefit both sides and help foster a working relationship based on trust.

02

Supply Chain
Finance

Mr. Jessulat, what problem does reverse factoring solve, and how does such an arrangement work?

Jessulat: ElringKlinger launched a reverse factoring scheme last year. It allows participating suppliers to assign their receivables from ElringKlinger Group companies to the financing bank if they accept a discount. This enables them to get their invoices paid early, albeit with that discount applied. When the invoice falls due, ElringKlinger then settles it with the bank providing the finance rather than with the supplier.

Liquidity is an important asset for companies to have. So do both sides get something out of an arrangement like this?

Jessulat: Yes, an arrangement like this is geared toward improving the liquidity situation at both the companies involved, i. e., ElringKlinger as well as its suppliers. This is important, particularly in uncertain times like these. Every company wants full coffers and healthy financing for its business.

What are the specific benefits for ElringKlinger and its suppliers?

Jessulat: The reverse factoring scheme is mainly about generating added value for the Group and its suppliers. Suppliers can sometimes get more favorable terms than with their own alternative financing arrangements. Getting bills settled early can be financed based on the creditworthiness of ElringKlinger. It also gives suppliers more flexibility.

So it's a scheme for suppliers?

Jessulat: No, not just that. The reverse factoring scheme also lets ElringKlinger optimize its own liquidity situation. We can make full use of our agreed payment terms in order to improve our working capital. Ultimately, the reverse factoring arrangement helps to build a working relationship based on trust between ElringKlinger and its suppliers through the benefits it brings.

» The reverse factoring arrangement helps to build a working relationship based on trust between ElringKlinger and its suppliers. «

Thomas Jessulat, CFO, ElringKlinger AG

You don't need to study the graphs of energy and transportation prices particularly hard to see that the past 24 months have been tricky. What's been behind that?

Weckenmann: Yes, the two markets have been hit by multiple shortages and crises piling in at the same time. Unlike in the two previous years, which were dominated by semiconductor and container shortages among other things, 2022 was a year of price rises – some of them extreme – that also affected transportation and energy. Exacerbated here and there by the war in Ukraine, the price of natural gas, for example, was quadruple that of its pre-pandemic level at times. All of us are feeling the effect of the energy crisis in our everyday lives. For a corporate group like ElringKlinger, the new situation meant once again that the less energy we use, the less energy we will need to buy. We in the Group benefit from the fact that we generate much of the energy we need ourselves at some of our sites – and from renewable sources at that.

How did you respond to the situation?

Weckenmann: The main factor in terms of purchasing was a forward-looking, long-term procurement strategy that had enabled us to cover most of our energy needs before the crisis even emerged. This meant that a significant portion was acquired on terms that were much better than the market, despite the crisis. Nevertheless, as a manufacturing company we still faced significantly higher energy costs overall last year.

How did the situation develop with your transportation supply chains?

Weckenmann: The situation with freight costs was slightly different. Happily, freight prices fell as the year went on, ultimately dropping to a level last seen prior to the Ever Given accident in the Suez Canal in March 2021. Shipping containers are even back below the prices they were at before the coronavirus pandemic. Nevertheless, we mustn't forget the many bottlenecks that supply chains are still grappling with. Semiconductors, for instance, have remained in short supply, while the war in Ukraine has exacerbated bottlenecks affecting products manufactured there or in Russia.

So what does the future hold in terms of procuring energy and transportation services?

Weckenmann: Of course, it's hard to make predictions about something like this. Last year showed us how quickly some things that people held to be certain can be called into question. Energy will remain a key issue in the industry. Despite all the uncertainty, however, we have a good understanding of the current market situation. We know how we can respond and keep on influencing our purchasing and supply chain situation for the better.

» Despite all the uncertainty, we have a good understanding of the current market situation. «

Bernd Weckenmann, Vice President
Procurement & Supply Chain
Management, ElringKlinger AG

03

Energy and
transportation



VIBRANT

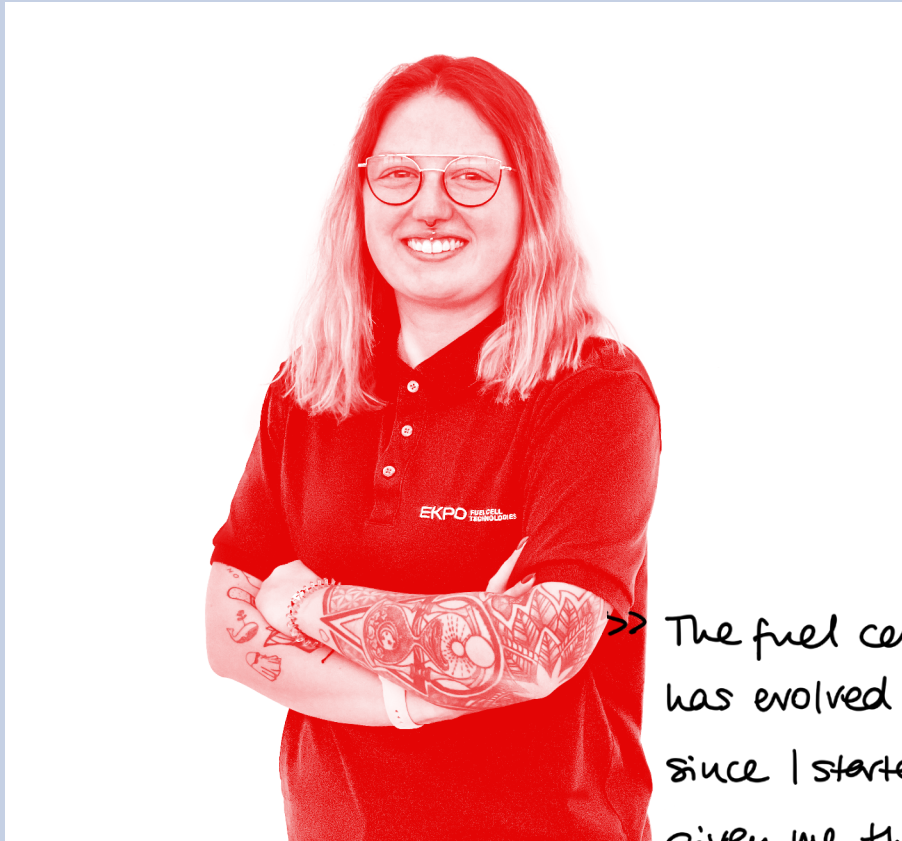


An agile company needs agile people. This is especially important in industries that are experiencing a profound transformation, like the automotive industry. In our series of portraits of people, we introduce some of the employees of ElringKlinger who are now working in different areas than when they first started out in their job. They have experienced exciting changes in their work because they were open minded and willing to develop themselves further. As we follow the paths their careers have taken, we provide an insight into our working worlds, the dynamics of which always have an effect on both sides: the technology and the person.



PEOPLE





>> The fuel cell unit has evolved significantly since I started. That's given me the opportunity to shape some of it. So, my main duties have changed a lot over this time. <<

**Yvonne Fink, EKPO,
Dettingen/Erms, Germany**

Yvonne Fink's career to date is a good example of how the technological transformation is closely linked to changes in how people work. By embracing this transformation with an interested and open mind, Yvonne Fink has not only learned a lot – she has also seized opportunities.

Yvonne joined ElringKlinger back in 2015 as an apprentice tool mechanic. "Although I was working in what is traditionally a male-dominated environment, I always felt very comfortable," she mentions. At the time she successfully completed her apprenticeship, employees with technical qualifications were in great demand in the battery and fuel cell teams. Although it was not possible to give her a job as a toolmaker there, Yvonne decided to make the switch to battery manufacture. During a brief stint in warehouse logis-

tics that was actually only intended to familiarize her with the area, she developed a strong interest in the components being put into storage. She improved the parts picking process and implemented new ideas. With the fuel cell team also looking for this kind of commitment, she made another switch. The fuel cell unit at ElringKlinger continued to grow rapidly while she was there, with new production facilities being built and EKPO Fuel Cell Technologies being set up. The ever-expanding organization called for a steady stream of new solutions in Yvonne's area of work, which she found with the help of her scheduling and work preparation colleagues. Currently, she is undertaking further training to qualify as a state-certified mechanical engineer. That primes her for new challenges. "Which I'll ideally be tackling at EKPO!" Yvonne says.



**Wasim Shaikh, ElringKlinger,
Ranjangaon, India**

Wasim Shaikh began his career at ElringKlinger India as a maintenance officer. Today, he works as an industrial engineer in the Lightweighting/Elastomer Technology business unit. Two personal traits have strongly influenced his career: his natural curiosity as well as an interest in constant learning.

Asked about the difference between his tasks in the past and today, the engineer explains: "At the beginning of my career with ElringKlinger, I was responsible for the maintenance of machines. Today, I am responsible for processes as well." Process optimization is an ongoing issue at a company that grows steadily and strives for continuous progress. Likewise, new task profiles of employees change or emerge. Wasim actively helped to shape change processes – even if it wasn't always easy to leave the comfort zone, as he says today. This included moving to a different team as well as retraining and acquiring new skills. For him, aligning personal and company goals is a key success factor. Making use of his experience and constantly working on a better version of himself will continue to be the drivers of his professional work in the future, he assures.

» Aligning the company's visions and values with my own is a way to achieve success, both on at a personal as well as at an organizational level. «

» I've found that humor and humility help make the hours at work more enjoyable. To learn new things is something else that's always been important to me. «



Daniel Fowlds, ElringKlinger, Redcar, UK

When Daniel Fowlds started with ElringKlinger at the British site Redcar in 2011, he worked in manufacturing of heat shields and sealing systems. Now, he is a member of the senior management team and responsible for the Supply Chain Management division. When you look at his vitae, two personal motives stand out in particular: his firm conviction that enormous potential is released through functioning teams and his dedication to the highest quality.

His experience is valuable. For example, as a Quality Engineer, he initiated a continuous improvement program that helped his plant pass an important certification audit with zero non-conformities. During an assignment that lasted several months at another ElringKlinger site, he was tasked with the introduction of quality systems for a new product group and for specific manufacturing methods to meet with ElringKlinger standards. Later, as a senior quality engineer, he built a team to manage products and processes through the development phase and into production.

While he originally focused mainly on self-development, Daniel's aspirations have recently shifted more to helping others develop skills. Overall, it seems that continuous improvement is not only the main goal of his job, but also part of his personal development. Now in his early thirties, Daniel is staying true to his philosophy: "Since January 2023, I've been participating in an internal leadership development program. I look forward to making the most of this opportunity!"



» motivating teams
and leading
them to a common
albeit difficult,
goal is one of the
most rewarding
experiences you can
have! «

Nicole Martin, ElringKlinger, Southfield, Michigan, USA

Looking at Nicole Martin's career to date, you get the impression of someone who never stands still. When she took up her new position at ElringKlinger's site in Southfield, Michigan, USA, in 2019, she arrived with professional experience from various roles. Since then, she has always been on hand wherever her expertise has proven particularly valuable.

Nicole's initial function at ElringKlinger was Supply Chain Project Manager. Following several stints in production engineering, which is part of production planning, she is now in charge of MRP controlling as Team Lead. She has always been willing to change roles within the company to meet operational requirements. Her readiness to switch teams and familiarize herself

with new techniques such as pre-calculation were also important factors. Nicole describes them as hurdles that had to be overcome and that proved worthwhile in three respects: for the success of the company, for her own continuous self-improvement, and for the change that both of these make possible. Nicole also knows the point in her career when it became more important to her to pass on experience to colleagues and for their benefit. When asked about her plans, she excitingly anticipates what comes next: "I plan to pursue APICS certification¹ and, in general, am confident that the future will bring some interesting challenges. We will see!"

¹ A global qualification standard, for supply chain management in this case

SUSTAINABILITY AT ELRINGKLINGER



ElringKlinger is aware, at all times, of its corporate responsibility toward its employees, customers, business partners, shareholders, and the wider community – because sustainability means viability for the future.



5

FIELDS OF ACTIVITY shape the company's approach to sustainability, because ElringKlinger considers its activities to be inextricably linked to its economic, environmental, and social responsibility. The

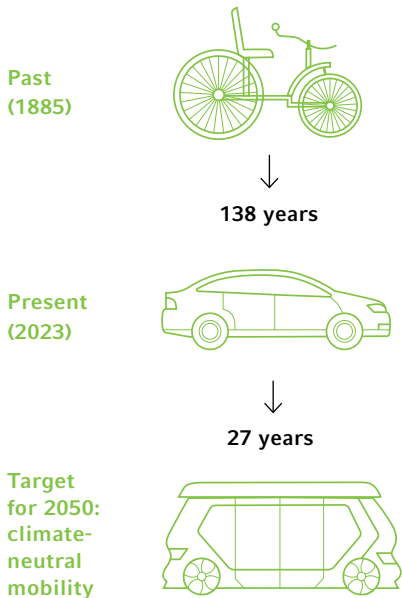
Group sees sustainability as a major opportunity to preserve the planet as a place worth living on through technological developments within its sphere of influence, while also promoting social progress and fostering prosperity.

1 | PRODUCTS AND INNOVATIONS Although nobody knows yet what the mobility of the day after tomorrow will look like, one thing is certain: it will be virtually emission-free. This will be achieved by many countries imposing tougher laws and through society's commitment to mitigating climate change and protecting the environment. More and more people are making an effort to shrink their personal footprint and are ready to embrace new technologies, as shown not least by the robust demand for zero-emission vehicles. The transformation under way in the automotive industry is accelerating rapidly, and the sector is working hard to align its existing production and processes with the new requirements.

ElringKlinger is not standing idly by while this major transition unfolds. As an automotive supplier, the Group has been working for over two decades on its vision of facilitating large-volume, emission-free mobility and becoming independent of vehicles powered by combustion engines. These efforts have resulted in an extensive range of products that harness the new drive technologies, that reflect the Group's core areas of expertise – coating, punching, embossing, molding, and plastic injection molding – and that are already being mass-produced in some cases. Primarily, however, the Group has taken on an important and pioneering role in electromobility by working together with other key players. This is fostering fruitful development partnerships that will also allow other forms of mobility such as aviation to achieve net zero, for example. As an enabler of a climate-neutral future, ElringKlinger always has an eye on the environmental impact of its individual products as well, because this must also be kept as low as possible to support the circular economy.

The transportation sector will need to shrink its carbon footprint significantly over the next few years. It is responsible for around a quarter of all of Europe's greenhouse gas emissions. If the EU's target of reaching net zero by 2050 is to be achieved, the sector will need to continue its massive transformation – a mammoth undertaking.

THE EVOLUTION OF THE VEHICLE – FROM THE VERY FIRST EXAMPLE THROUGH TO THE VEHICLE OF THE FUTURE



2 | ENVIRONMENT AND QUALITY So small yet so consequential: carbon dioxide is merely a molecule. Yet its impact is manifold: it fuels the greenhouse effect, allows life to exist on Earth, and is also one of the causes of the greatest challenge of the 21st century – the climate crisis. For over a thousand years, it and other natural greenhouse gases kept the global average near-surface temperature of the Earth at just under 15 degrees Celsius. But the Industrial Revolution threw this out of kilter. The burning of fossil fuels such as coal, oil, and natural gas, as well as the expansion of industrial production and changes to land use modified the mass balance of the atmosphere, thus magnifying the natural greenhouse effect and steadily warming the Earth. The consequences of this have been striking: blazing heat, lengthy droughts, hurricanes, and unmanageable floods triggered by heavy rain or earthquakes are becoming increasingly common.

Although measures to protect the environment have been put in place across the board in recent years, they are not enough. Society is still pumping out vast quantities of harmful emissions – too much to stop global heating. In fact, the eleventh hour has come and gone. Many changes, particularly in the oceans, on the ice sheets, and in global water levels, are already irreversible – even over a very long period of time – due to past and future greenhouse gas emissions. This makes it all the more important that we as a society now act fast and judiciously so that we can limit the impact of climate change in the long term.

ElringKlinger is actively embracing its responsibility to protect the climate and has set a Group-wide target for reducing greenhouse gases. The Group aims to become carbon-neutral in net terms by 2030 in respect of its own business activities (Scope 1 and Scope 2 emissions) and has identified four fields of activity to this end. These include: (1) increasing energy efficiency at company sites by 2.5% a year (baseline year: 2019) by optimizing existing production processes and making existing systems and buildings more energy efficient; and (2) generating more of its own electricity by, for example, using more waste heat or fitting solar panels. In the third field of activity, the Group will be switching all its electricity supply contracts from gray to green electricity by 2030. Any emissions that are absolutely unavoidable will be offset by investing in external carbon reduction projects.

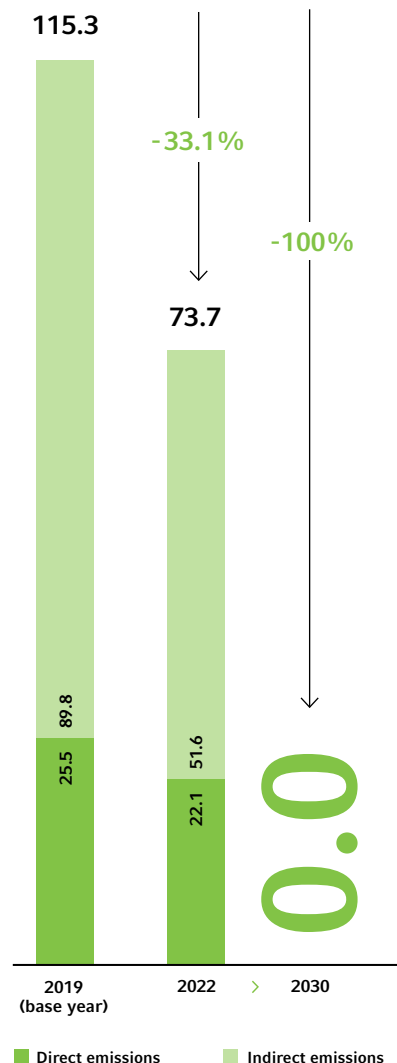
ElringKlinger's stated aim is to raise awareness of environmentally sustainable behavior within the Group in order to minimize its environmental impact together with all its staff.

It will not stop there, however, because sustainability at ElringKlinger does not begin and end at the factory gates. The Group also encourages and demands full commitment on the part of its suppliers in terms of implementing sustainability programs as well as creating transparency. After all, sustainability is a key prerequisite for shared long-term success.

Across the world, more resources are being consumed every year than can be re-generated by natural means. Theoretically, the human race consumed 1.75 Earths in 2022. The consequences of this overuse will be felt most keenly by future generations.

OUR GOAL: 0.0 EMISSIONS IN 2030


(ElringKlinger's direct and indirect emissions in thousand tons)



3 | EMPLOYEES Exactly 9,540 people shape the ElringKlinger Group and keep it moving. All of them have different roles within the Group. But regardless of whether they are development engineers, sales executives, or production assistants, they have always pursued a common aim: to guide the company into the future with enthusiasm and pioneering spirit, as the past 140 or more years demonstrate.

The skills of ElringKlinger's employees are shaped by their different backgrounds, cultures, and experience. Intercultural diversity and tolerance are key values for a company to possess in a globalized world. For this reason, diversity, equal opportunities, and workplace equality are among the most important values that influence what goes on every day. This allows all employees to bring their professional and personal strengths to bear in the best possible way and help shape the transformation toward emission-neutral mobility.

ElringKlinger is continuing on the road to a digital, interconnected, and global world of work with agility and openness. It is making every effort to retain the long-term loyalty of its employees so that, together, it and they can work to further develop the mobility of the future. The Group therefore has a clear mission to be an attractive employer that can offer its staff the best possible conditions, including wide-ranging career opportunities, flexible working time models, fair pay, and forward-looking opportunities for continuing professional development.



The people at ElringKlinger are genuine team players with the motivation required to shape mobility in a more environmentally sustainable way.

9,540

Exactly 9,540 people shape the ElringKlinger Group and keep it moving.

EMBRACING DIVERSITY

Around 70 countries are represented in the ElringKlinger Group workforce.

EXPANDING KNOWLEDGE

ElringKlinger trains some 150 young people every year.

CULTIVATING A PIONEERING SPIRIT

Over 600 research and development staff help to design products of the future on a daily basis.

4 | SOCIAL ENGAGEMENT The decisions that the company makes always affects society and the environment as well. In particular, they have an impact on the parts of the world in which ElringKlinger has production facilities and sales offices, meaning that its corporate responsibility extends beyond company premises. No longer restricted merely to developing and manufacturing high-tech products, preserving jobs, and increasing company profits, this now includes the socially and environmentally responsible development of whole regions as well. This is why ElringKlinger makes an active contribution to the common good and social progress, particularly in those areas where it has a presence. Through targeted projects, ElringKlinger builds structures in a local setting that have a lasting impact, whether they involve cash donations, donations in kind, or voluntary work on social projects.

ElringKlinger undertakes social engagement indirectly via the Lechler Foundation, which is also the main shareholder in ElringKlinger AG. Every year, therefore, the company contributes part of its profits to the foundation, which exclusively supports non-profit associations and institutions involved in healthcare, education, and helping young people, the elderly, and people with disabilities.

DONATIONS IN KIND AND VOLUNTEERING IN EUROPE

The coronavirus pandemic has put many local organizations and associations in financial difficulties, so up-and-coming managers in Europe set up an online platform where people affected could tell their own story about the impact of the pandemic and the support that they needed. This led to donations in kind being provided to the local kindergartens in Dettingen/Erms in Germany, while staff also renovated classrooms at the elementary school near the company's Turkish site in Bursa.

CLIMATE ACTION IN NORTH AND SOUTH AMERICA

Next-generation executives did their bit for conservation as part of a management scheme in 2022 and collected donations for sponsoring trees that have enabled 13,765 new trees to be planted.

PROMOTING INCLUSION IN ASIA-PACIFIC

Young executives in the Asia-Pacific region put inclusion at the heart of their social project, where they helped people with physical disabilities to make handicrafts and sell their creations. The EUR 37,000 that this made was donated to workshops for people with disabilities, thus enabling them to continue to make various products under their own steam.

Representatives of the workshops for people with disabilities were invited to the ceremonial event for the presentation of a check at the Chinese factory in Changchun.



3

values

5 | CORPORATE GOVERNANCE Good, responsible corporate governance that is focused on creating value over the long term is the shared responsibility of the Supervisory Board, the Management Board, managers, and the whole workforce. This responsibility is based on three values: transparency, trust, and integrity.

THREE VALUES that are firmly embedded in ElringKlinger's company culture, that guide managers and staff, and that lay the foundation for good corporate governance within the Group.

THREE VALUES that ensure transparent decision-making at all levels of the company hierarchy, responsible management and leadership, and compliance with ethical principles and statutory regulations.

THREE VALUES that give stability to a world full of changes, including climate change, globalization, and digitalization, and that foster a common approach within the company.

THREE VALUES that have played a part in the company's success over the past 140 or more years of its history in combination with a clear strategic focus.

And it is also these **THREE VALUES** that make it possible to help shape the transformation currently under way in the market.

transparency
trust
integrity

Underpinned by this strong company culture, corporate governance in the ElringKlinger Group goes above and beyond the 20-year reporting obligation enshrined in the German Corporate Governance Code, because the Group has always placed great importance on transparent communication. As an employer, a listed company, and a key player in the public sphere, ElringKlinger acts this way in order to provide an insight into the make-up of its Management Board and Supervisory Board, its compliance with laws and regulations, its risk assessment and risk management, its relations with shareholders and stakeholders, and its commitment to upholding ethical standards. In so doing, it strengthens the credibility and trust that the Group has earned in the eyes of all its stakeholders.

Global presence

46 sites

Europe (excluding Germany)

29%

SHARE OF SALES

1,709
EMPLOYEES

12
SITES



North America

26%

SHARE OF SALES

1,666
EMPLOYEES

8
SITES

South America
and rest
of the world

5%

SHARE OF SALES

431
EMPLOYEES

2
SITES

Asia-
Pacific

20%

SHARE OF SALES

1,665
EMPLOYEES

11
SITES

Germany

20%

SHARE OF SALES

4,069

EMPLOYEES

13

SITES



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