ECO

THE DÜRR GROUP MAGAZINE 2023

STAY CURIOUS

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STAY CURIOUS

Small children have many questions. Anything that is new or that they don't know sparks their curiosity. We should not lose this inquisitive nature. A sense of wonder, observing, trying things out, and asking questions all lead us to exciting insights, allow us to enter uncharted territory, give us a new perspective, and enhance our creativity.
At the Dürr Group, there is plenty of room for curiosity. It is what drives our innovation and progress, and defines our entrepreneurial thinking and acting.
We believe: Those who stay curious do not stand still.

Fancy that!
Why would you find a four-legged member of staff and kilos of walnuts in a mechanical and plant engineering firm? You can read the answers to this and other curious questions in our magazine.

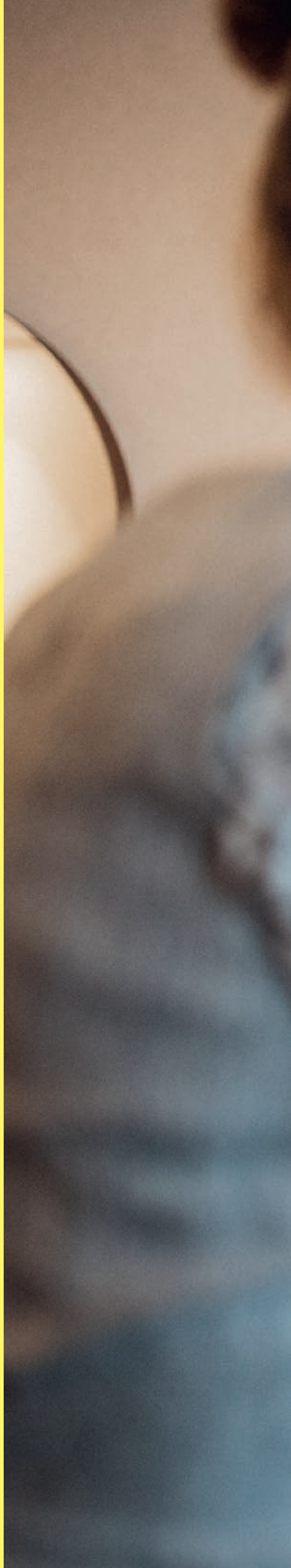
ECO MAGAZINE ON THE WEB
You can find the web version here:
https://www.durr-group.com/en/duerrmore/stay-curious

Climate, facts, and emotions

DR. JOCHEN WEYRAUCH MEETS HANNAH HELMKE

The fight against climate change is the biggest task humanity is facing today. To address this challenge, companies need new and, at times, unusual ideas. That is why Dürr CEO Dr. Jochen Weyrauch is meeting entrepreneur Hannah Helmke. Together with her team at her company, right°, the 34-year-old founder has developed a calculation model designed to push corporations to lower their CO_2 emissions. This is a dialog about the power of facts and emotions.

RECORDED BY: **HEIMO FISCHER** — PHOTOS: **SASCHA FEUSTER**



Jochen Weyrauch Good to have you here today and to have this conversation. I want to know more about your company, which is called right°. You offer a software tool that shows businesses, without the shadow of a doubt, how strong their climate impact is. That's an important topic. It's a burning issue not only for us but also for our shareholders and customers. How did this business idea come about?

Hannah Helmke Even more than ten years ago, I was wondering how it might be possible to bring a better understanding of the effects of climate change into the business world. That's when I came across a paper by the major bank HSBC. It explained why there are also financial risks associated with the continued burning of fossil fuels. I was thrilled. Someone had finally captured the essence of the matter in clear terms for the capital markets. This led to the idea of developing a scientifically robust calculation model that companies could use at any time to measure their exposure to climate risks. When I was working for my employer at the time, I didn't manage to get the project off the ground. However, I was so driven by this idea that I saw no other option but to set up my own company.

W What did the founding process look like? You built the company with a partner. Was there a distribution of tasks?

H I set up the company with Sebastian Müller, who is also my life partner. We share the idea of being free to shape our lives. We see having our own company as the highest level of freedom. During the founding stage, Sebastian initially continued to work as a lawyer. When we felt the company was giving us enough security, he left the law firm and got involved full-time.

W Don't these conditions make it hard to separate your professional and private lives?

H It wasn't easy to start with. We were living and working in an industrial loft apartment in Frankfurt. Sometimes, we had corporate events there with 60 people. During that time, we blocked off our open-plan sleeping area. When the guests and catering staff had gone, we noticed how difficult it was for us to switch back to our private life. Over time, we have learned to deal with it better.

W Climate change is seen as the biggest problem of our time. Many people feel powerless, whereas you proactively approach companies. What exactly do you offer?

H We show companies by how many degrees the earth's temperature would rise if the whole world acted like them. When we tell managing directors that their company does not meet the temperature target set out in the Paris Climate Agreement, we appeal to their sense of ambition.

ABOUT RIGHT°

At the core of the company right° is a model that calculates how strong the impact of a business is on the climate. By giving a simple °C figure, it answers the question of how much the earth's temperature would rise if the whole world had the same climate performance as this company. The benchmark for good or poor performance is the temperature target set out in the Paris Climate Agreement. It states that the temperature rise due to human activity is to be limited to a maximum of 1.5°C compared to pre-industrial levels. If a company's impact on the climate is substantially above this figure, it is not deemed to be future-proof.

The model is based on current findings from climate science. It includes a climate model that is also used by the Intergovernmental Panel on Climate Change (IPCC). The fundamental method has undergone an assessment process to verify its scientific quality. Customers can use a basic version of this software free of charge. To receive a more comprehensive analysis, they need to buy a license.

HANNAH HELMKE
The entrepreneur, who was born in 1988, studied psychology and international business. Before setting up right°, she worked for an IT service provider and for Deutsche Post/DHL.

DR. JOCHEN WEYRAUCH
The industrial engineer has spent many years in the automotive industry as well as in other industrial sectors and has also worked as a private equity consultant. Weyrauch has been on Dürr AG's Board of Management since 2017, taking over as Chair in 2022.

They might react with anger or annoyance. These emotions are important. We use them to open doors in order to have an objective conversation and change people's way of thinking.

W Since 2022, we at the Dürr Group have been buying only green electricity in Germany, and from this year onward, we will be doing so worldwide. We are also expanding our use of photovoltaics, and soon we will be driving only electric company cars. So your calculation model could enable our company to see, at any point, how effective a certain measure is in conforming with the global 1.5°C target?

H Exactly. And depending on the sector, this is what it takes for some decision makers to understand that they need to adapt their business model so as not to jeopardize their company's future.

W With your business idea you are taking an objective approach, while also emphasizing emotions as the driver of human behavior. What do you think about climate activists who act emotionally and sometimes radically?

H It's not for me to judge this. The people in Germany who are currently fighting for an immediate abandonment of fossil fuels feel helpless and are trying to deal with their anger. I understand that because I'm often angry myself — since so many things could go so much better. However, I have decided to turn my anger into constructive energy in order to improve a system that I think needs improving.

W I agree with most of what you're saying. While even justified protest must have limits, I do think that emotions are often what set things in motion and pave the way for objective arguments. And if I understand you correctly, this is how you want to change our economic system from the inside.

H Exactly. There is no point fighting against the system, but we must instead learn to work with it. This is also why I try to understand how companies and managers tick. On this note, I want to ask you a question: How does climate change affect your personal behavior?

W I admit that the choices I make in my personal life are not always totally sustainable. I eat meat and I'm a passionate recreational pilot. But the topic has been on my mind for a while now, both as a private individual and as a CEO.

H In terms of climate, this is a now-or-never moment. In your position, you can achieve a great deal. What do you want your time as a company head to represent one day?

> "I'm often angry myself — since so many things could go so much better."

Entrepreneur Hannah Helmke during the conversation in Frankfurt.

W I think this time will be marked by our development toward a sustainable company. After all, Dürr has products that are powerful levers. Paint shops account for almost half the greenhouse gas emissions generated in an automotive factory. Today, it is technically feasible to reduce these emissions to zero by converting plants from gas to green electricity. In Hungary, we are currently building the first climate-neutral painting line. Of course, it is ultimately our customers who decide if they want to invest in a clean plant.

H So should your actions be guided by your customers or do you want to be in the driving seat?

W We have set ourselves the target of reducing the carbon emissions of our supply chain and the emissions generated by the use of our products by at least 15 percent by 2030. To achieve this, we might have to turn down projects if the requested systems don't meet modern environmental standards.

H Did you once want to set up your own company, too?

W Yes, but a different type from yours. After finishing high school, I spent some time thinking about opening a motorbike shop in Paris. But I soon abandoned that idea. Afterwards, I still took entrepreneurial risks. In the mid-2000s, I bought a part of the company I was managing at the time and ran it for several years. After that, I worked as a self-employed consultant in the private equity sector.

H You indicated earlier that you think about the effects of climate change a lot. Do you also see this issue as an intellectual challenge?

W Absolutely! I love learning. I'm also keen to learn from young people in our company. These conversations often get straight to the heart of the matter. I like that. For me, another intellectual challenge in this context is the use of digital tools. They give us clues as to how we can further reduce our greenhouse gas emissions. The importance of this is demonstrated by your business model — by the way, I want to ask you another question about this: Where do you see yourself in five years' time? Do you have a vision?

H Sure. We want to be the standard that is used to measure, control, and communicate the impact companies have on the climate. Plus, the vision Sebastian and I have is that, in five years' time, we can fully live out our personal freedom and independence through and with right°.

A compass
FOR THE GROUP

What defines the Dürr Group? What values and mission do we have? Answers to these questions cannot be prescribed to a company. They must come from within the organization and be supported by the workforce. This is why the Dürr Group, with the employees' broad participation, has developed a uniform corporate statement.

TEXT: **STEPHAN KÖHNLEIN** — PHOTOS: **SASCHA FEUSTER**

MACIEJ STAJEWSKI,
MANAGING DIRECTOR OF HOMAG POLSKA

"Through my contribution I was able to add a small 'personal brick' to the foundation of the whole organization."

"I view this corporate statement we have developed together as part of a modern corporate culture that focuses on the employees' involvement, on their individual development, and on a shared system of values."

DR. JOCHEN WEYRAUCH,
CEO OF DÜRR AG

Where have we come from? Using a timeline, the workshop participants explored important events in the company's history.

When the Head of Corporate Communications and Investor Relations, Andreas Schaller, looks back at the process of the past few months, he is still amazed by the great commitment with which many colleagues took part in this project. CEO Dr. Jochen Weyrauch set the ball rolling when he initiated the development of a corporate statement for the Group as he started his role at the beginning of 2022. Mid-year, the project gained real momentum when the entire workforce was invited to participate in developing this uniform corporate statement.

The aim was to come up with realistic and credible definitions of vision, mission, values, and purpose for the company. Going forward, these four aspects are to represent a reliable constant for customers and workforce, create an emotional bond with the company, and provide guidance when taking decisions and setting priorities. "This kind of process cannot simply be completed in a small group with a top-down approach," highlights Schaller as project manager. This is why it was decided to get external experts Hans-Wilhelm Eckert and Jutta-Anna Schroer on board.

The key task of the two consultants was to gain an insight into the organization and start conversations with its employees. Interviews were planned and workshops prepared — face-to-face at the Bietigheim, Schopfloch, and Darmstadt sites as well as online for people abroad. The list of questions that Schroer and Eckert asked the participants was long. What highlights, low points, and turning points have there been in the history of the Dürr Group? What has turned the company into what it is today? Why do customers, qualified staff, and investors come to us? This is how around 80 employees from different origins, functions, lengths of service, and of different ages provided the initial input for the corporate statement that was to be created.

"Developing our new corporate statement is more than a one-off initiative. It is intended to provide everyone with long-term guidance on the type of culture we want to practice at the Dürr Group."

SANDRA SEISS,
DEPUTY CHAIR OF THE WORKS COUNCIL
AT DÜRR SYSTEMS AG

Jutta-Anna Schroer

Systemic organizational development and management consulting

"Participating in this project made me think about what I have already experienced at the company, where the strengths of the Group lie, and how we can shape our future together."

YURONG KANG,
HEAD OF ADMINISTRATION & HUMAN
RESOURCES AT SCHENCK SHANGHAI

Together with communications consultant Dr. Hans-Wilhelm Eckert, Jutta-Anna Schroer supported the Dürr Group as an external expert in developing its corporate statement. Schroer, who studied psychology and sociology, says that even from her very first conversation with Andreas Schaller, she immediately felt that the project was intended to have a lasting impact. Since 1999, Schroer has been working as a consultant for organizational and human resources development, and as a trainer and coach. She has been self-employed since 2009. At the University of Munich, the University of Freiburg, and the European Business School in Oestrich-Winkel in Germany, Schroer has also taught topics such as systemic organizational consulting and conflict management. "To support people in the process of becoming and changing, to assist teams in their development, and to provide vitalizing inspiration to organizations are my key concern," she says.

During the analysis phase, the results from the workshops and interviews were then consolidated. This led to some initial suggestions for wordings, which, following an approval cycle with the Management Board, were discussed with the entire workforce during face-to-face and virtual feedback forums. "The response was very positive. Our colleagues were pleased that their opinions mattered and that they could be involved in the process," says Schaller. Schroer adds: "When we asked what defines the Dürr Group and what kind of cultural development the company needs in order to be well prepared for the future, we often found we were pushing at an open door."

For over 20 years, Schroer has been supporting companies in their organizational development and change management. "During my projects, I always ask myself whether they are designed in a way that is sustainable," says Schroer. At Dürr, she immediately felt that the project was not about producing a shiny brochure, but that it was genuinely aimed at determining the essence of the company. "In this project, the participatory approach was paramount from the outset."

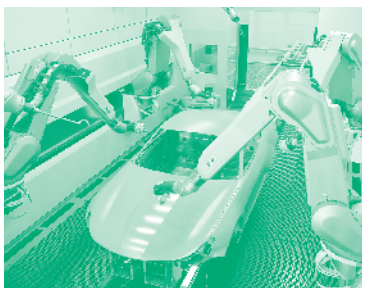
The rollout of the corporate statement in the Group is planned for the coming months. However, this does not mean the process is complete. "Cultural development is not a sprint but a marathon," confirms Schroer. It involves ongoing dialog to monitor the current status and whether the corporate statement is being put into practice. But it is worth it, as Schroer explains while referring to scientific studies: These show that purpose-oriented companies are more innovative than others, can recruit qualified staff more easily, and are considerably more resilient when faced with a crisis.

What does the Dürr Group's corporate statement look like? Scan this QR code to see the result of the teamwork: www.durr-group.com/en/duerrmore/stay-curious/a-compass-for-the-group

Which Dürr member has four legs?

A black coat, green eyes, and white whiskers — Eddie Murph the cat became an addition to Dürr Brasil's team in São Paulo as early as 2015. This four-legged friend has its own company ID card and, thanks to the employee magazine and social media, also has a good international network. His recruitment process: somewhat unconventional. Roaming around the campus on a regular basis was enough to conquer the employees' hearts. His job: no catnapping. What with all the sunbathing and cuddles, there is hardly any time left for other tasks.

We can already build paint shops today that operate entirely with electrical energy and without fossil fuels.



Greenabler.

With new technologies, Dürr is paving the way for the climate-neutral painting of cars. The company is focusing on the intelligent use of energy and the electrification of the plant.

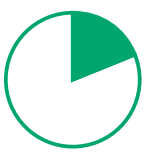
TEXT: **HEIMO FISCHER** — PHOTOS: **DÜRR**

Paint does not make a car faster or easier to maneuver, but no one will deny that it enhances the beauty of a vehicle. That is why manufacturers spend a lot of effort on this production stage. The car body is cleaned, passed through a dip bath, then it is painted several times and dried in between. No wonder that the paint shop accounts for more than 40 percent of the energy required in an automotive plant. But this also means that, being a paint shop manufacturer, Dürr can make a major contribution to reducing greenhouse gas emissions in the automotive industry by offering the right technologies.

For years, the company has been specifically developing technologies that enable its customers to produce in the most sustainable way possible. Dietmar Wieland is a Senior Manager in the research and development team and has been working for Dürr since 1991. He has been dealing with the topic of energy efficiency for just as long. "This continues to be one of the most important drivers of innovation," the development engineer says. Particularly in view of the high energy prices, automotive manufacturers have a great interest in keeping their operating costs under control.

Another current focus is on the electrification of all process steps during painting. This gives customers the opportunity to become independent of gas as a fossil fuel and to operate their plant in a climate-friendly way by using green electricity. "Many automakers have set themselves the aim of achieving a carbon-neutral production," Wieland says. "We support them in

In the EcoInCure oven, the hot air flows into the interior of the car body, ensuring optimal heat transfer to parts that are difficult to access.



UP TO

19%

in energy savings
were achieved by Dürr in a customer project by optimizing the heat and cold supply in the paint shop.

40%

less CO_2
is produced in the entire paint shop when Dürr's electric oven is operated with green electricity.

EcoQPower: The intelligent energy network for the paint shop

With an individually optimized combined heating and cooling system, Dürr can significantly reduce the overall energy consumption in the paint shop. The innovative EcoQPower system enables plant operators to electrify the paint shop efficiently, thus becoming independent of gas as a fossil fuel.

1. Climatic conditions

What is the location-specific climate? Outside conditions such as temperature and humidity affect the heating and cooling requirements in the paint shop.

2. Key production data

The next step takes into account, among other things, production capacity and processes, vehicle types, and the layout of the paint shop.

3. Heating and cooling requirement

With the help of internally developed software, Dürr determines the demand for heating and cooling in the form of a so-called source-sink profile.

4. Optimal temperature levels

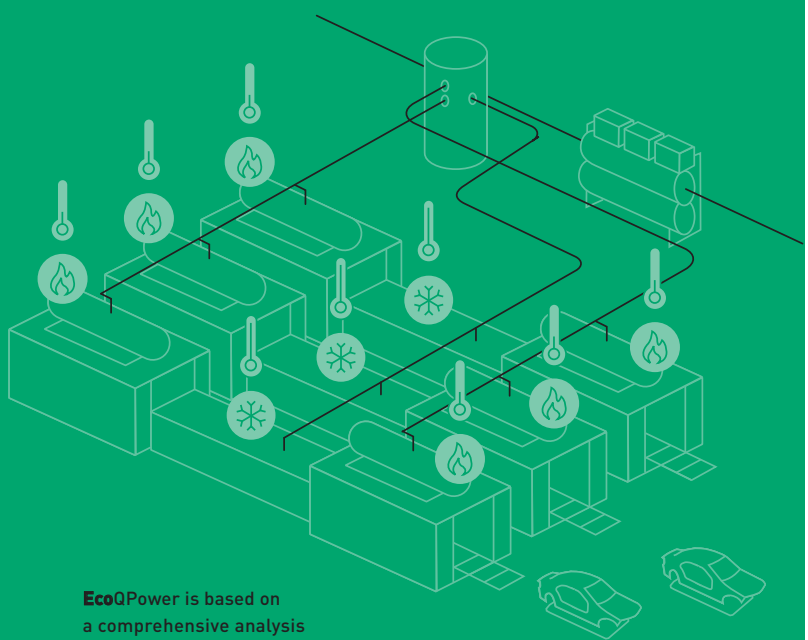
Various levels of heating and cooling are provided in order to meet the different process requirements of the individual plant components.

5. Hardware components

Depending on requirements, hot and cold water tanks, cooling towers, and heat pumps are integrated into the paint shop.

+ Green electricity

By using green electricity, car manufacturers can operate their paint shops in a climate-neutral manner.



EcoQPower is based on a comprehensive analysis of the individual heating and cooling requirements of a paint shop. It interconnects all components in such an intelligent way that almost no energy remains unused.

this effort with the right solutions." For a German customer, Dürr is currently building the first completely electrified paint shop that can be operated with zero emissions using green electricity. From the paint booth to application technology and digital applications: In every area, the customer relies on the latest innovations from the mechanical and plant engineering firm. Even car body ovens and exhaust-air purification systems are heated with electricity instead of gas.

Intelligent paint drying process

The use of the electrically powered **Eco**InCure oven alone can reduce the CO_2 emissions of the entire paint shop by 40 percent when using green electricity. And that is not the only advantage of the new generation of ovens. "By means of air flow simulations, we observed that the car body dries faster when it is heated from the inside out," Wieland reports. To allow the hot air for curing the paint to flow specifically through the opening for the windshield, the car bodies pass through the oven tunnel transversely, resulting in optimal heat transfer to parts that are difficult to access. This is particularly helpful in the case of EVs, as the electrically powered vehicles are reinforced underneath the door threshold on account of their large battery. These so-called rocker panels dry much better in the **Eco**InCure.

Burning without flame

When drying the car bodies, exhaust air is produced that contains pollutants in the form of solvents. In order to protect people and the environment, the exhaust air must be cleaned before it is released into the open air. One proven method is combustion — effective, but not optimal if a system is to be operated in a particularly eco-friendly manner. After all, the combustion process consumes a lot of energy, and gas is generally used for this purpose. In addition, the open flame produces unwanted by-products such as nitrogen oxides. But there is another solution. With the Oxi.**X** RV exhaust-air purification system, Dürr has an electric and flameless alternative in its portfolio.

A heat bed consisting of ceramic particles stores large amounts of energy during combustion. Once an electric heater has raised the operating temperature to 900 degrees, the combustion of the pollutants proceeds largely autothermally, i.e. in a self-sustained manner. "This means very little heat needs to be supplied from outside," Wieland explains. The amount of electricity needed to start the system can easily be covered from renewable sources.

How is green electricity generated?

The shift to regenerative energy is playing a key role in the reduction of climate-damaging greenhouse gases. Unlike fossil fuels such as coal, oil, or natural gas, the generation of green electricity results in less or even zero carbon emissions. Here are the most important renewable energy sources at a glance:

Wind power

Wind power stations harness the upward force generated by the wind flowing past the rotor blades, thus causing the turbine to rotate. A generator converts the force produced by this rotary motion into electric energy.

Hydro power

In hydroelectric power stations, the kinetic energy of the flowing water is first transferred to a turbine and then to a generator that finally converts it into electricity. With pumped-storage power plants, it is even possible to harness the power of water to store energy.

Geothermal power

The extremely high temperatures in the Earth's interior heat up its upper layers and subterranean water reservoirs. This energy source is tapped through drilling and then used for electricity, and heat generation in particular.

Solar power

Photovoltaic modules installed on roofs or in open spaces come with semiconductors such as silicon that convert solar light into electricity. Thermal energy for heating or hot water production can also be generated from solar radiation.

Biomass

In biogas plants, special bacteria help to produce gases from plants, organic waste, wood, or liquid manure. In a next step, the biogas is burnt to produce electricity. Biomass is the allrounder among the renewables: It can serve as a basis for producing electric and thermal energy, as well as fuel.

EXTREMELY EFFICIENT: Once the Oxi.**X** RV exhaust-air purification system has reached operating temperature, it runs in a self-sustained manner in terms of energy.

Green nervous system for the paint shop

As a systems supplier, Dürr looks not only at individual processes and products on the way to a sustainable paint shop, but also at the plant as a whole. The latest result and a milestone in energy efficiency: **Eco**QPower, a combined heating and cooling system individually optimized for each paint shop.

In automotive plants, energy has so far been provided centrally and often based on a blanket approach. "This results in most process steps being supplied with the same temperature level — even though it is not needed by all of them," says the 59-year-old. In the case of the hot water supply of a paint shop, for example, the particularly high heat requirement of the intermediate ovens is taken into account, which is around 80°C. However, the high-temperature water is then also used to supply ventilation systems, which only need to heat the room air to 21°C.

"Many automakers have set themselves the aim of achieving a carbon-neutral production."

DIETMAR WIELAND,
SENIOR MANAGER IN DÜRR'S R&D TEAM

So why not supply each process step with only the amount of energy and the temperature level that is actually needed? **Eco**QPower can do just that. Cooling and heat are generated in a decentralized manner in the paint shop using electricity. Moreover, the intelligent system prevents the loss of energy. For example, in cathodic dip-coating, paint is applied using an electric current, generating heat that has remained unused until now. **Eco**QPower uses these and other waste heat sources, supplying other areas of the paint shop with the recovered energy.

Before the Dürr specialists equip a new paint shop with **Eco**QPower, they have to investigate the climatic conditions of the location. After all, it is hotter and more humid in a tropical region than in Scandinavia. The necessary statistics are provided by weather stations. In addition, data such as production quantity and vehicle type are included in the calculation. This overall picture provides an indication of how the energy flows need to be interconnected in order to achieve the most efficient operation. On this basis, heat pumps, hot and cold water tanks, and cooling towers are installed. They are interconnected by intelligent software — and the paint shop's green nervous system is ready.

EcoQPower has enabled Dürr to reduce the energy consumption of a paint shop by up to 19 percent. This largely compensates for the additional costs of electricity, which is a more expensive energy source. "Even at locations that are climatically ideal for operating a paint shop, we can achieve energy savings in the double-digit range," says Wieland, summarizing the potential of the innovative system.

Going green

Thanks to its energy- and emission-optimized systems, the Dürr Group enables its customers to establish sustainable manufacturing processes. To this end, we focus on industries that drive the transformation toward a carbon-neutral society through their climate-friendly products. In addition, we improve our own climate footprint.

Sustainable building and living

HOMAG, a subgroup of the Dürr Group, continues to expand its business in production systems for climate-friendly timber houses. (⟶ **For more details, refer to page 44.**) The Group also relies on timber as a sustainable building material for its own site development.

Sustainable site investments

In 2022, photovoltaic systems were installed at factory and office buildings in Germany, China, and Spain. In addition, numerous sites were equipped with charging stations for electric company cars. All the Dürr Group companies in Germany, India, Canada, Mexico, Brazil, and the United States have been using 100 percent green electricity since 2022. All other sites will follow in 2023. The Group was able to reduce its oil and gas consumption by 5 percent in 2022.

Tuned to serve the e-mobility market

The Dürr Group develops special technologies for e-car production. Prime examples include test stands for electric motors as well as manufacturing technology for battery cells.

70%

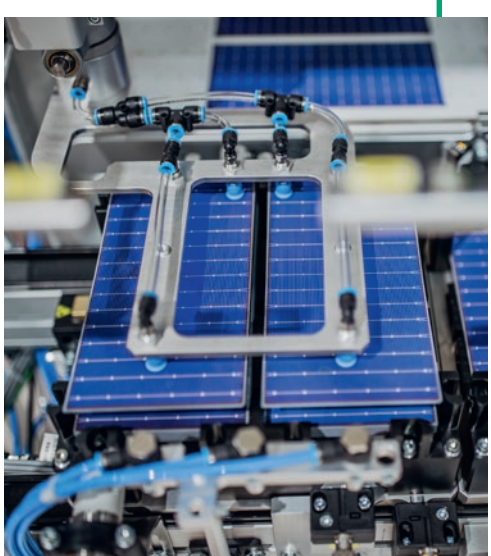
Dürr Group well underway to achieving climate goals

In 2022, the greenhouse gas emissions directly attributable to the company decreased by 43 percent. Compared to 2019, the reduction was even greater, amounting to 51 percent. The Dürr Group thus exceeded its 40 percent target and is already well underway toward the 70 percent reduction target to be achieved by 2030.

–12%

Lower energy intensity

The energy intensity of our business operations strongly improved in 2022. Compared to the previous year, 12 percent less energy was consumed per one million euros in sales. The Group's energy consumption only rose by 7 percent as compared to a 22 percent increase in sales.



Technology for the energy transition

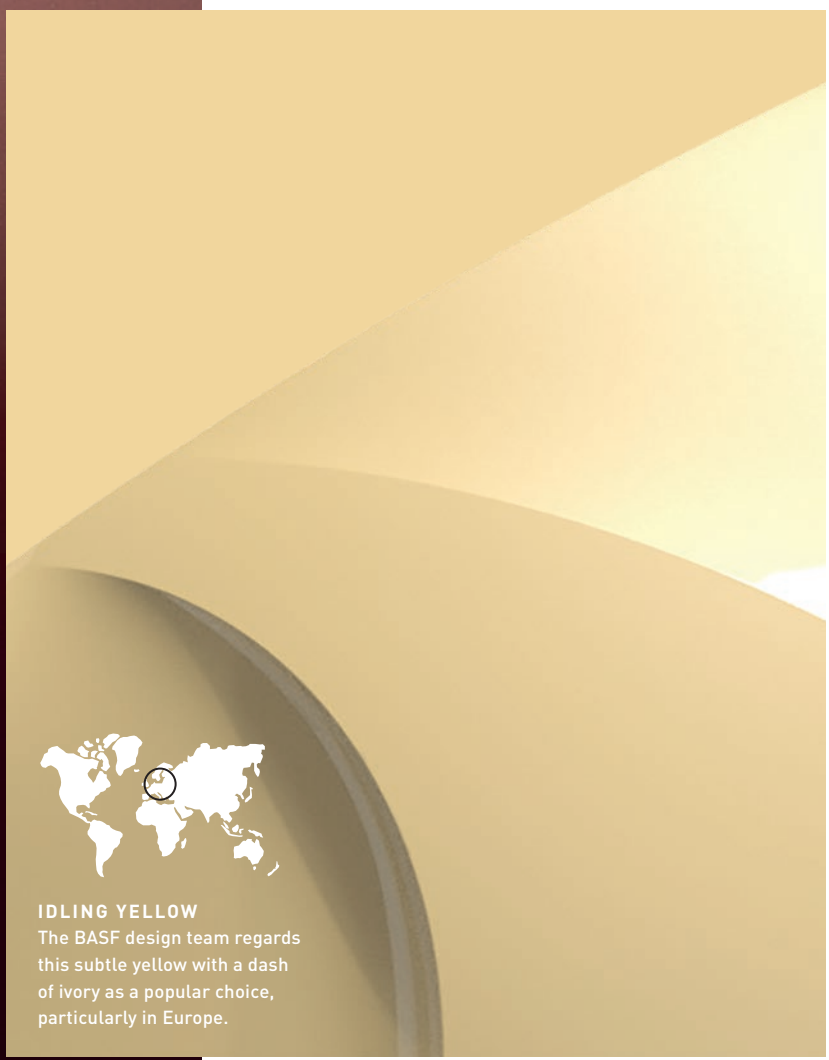
In 2022, automation specialist Teamtechnik, which is part of the Dürr Group, received its largest order to date for solar panel production systems. (⟶ **For more details, refer to page 32.**)

TREND SETTER

The right color underlines the character of a car like no other feature. Designer Mark Gutjahr from paint specialist BASF and his team anticipate the painting trends in the automotive industry years in advance.

TEXT: **HEIMO FISCHER** — IMAGE MATERIAL: **BASF**

LAMBENT EARTH
It is often not just the new color shades that are unusual but also their names.



IDLING YELLOW
The BASF design team regards this subtle yellow with a dash of ivory as a popular choice, particularly in Europe.

Mark Gutjahr's raw materials are on the work table of his studio. Among them a few pebbles, colorful papers and an empty Italian tomato can. Waste? Not at all! For the designer, these objects are witnesses to the zeitgeist. Gutjahr and the global design team at BASF are researching what automotive paints tomorrow's customers will want.

After all, the paint on the cars should still look modern — not old-fashioned — even years after purchase. "That is why it's important to recognize long-term trends and not chase after every short-lived fashion," says the 49-year-old. The paint specialists engage in this task in an old villa on the edge of the factory premises in the German city of Münster. Once the color shades of the future have been determined, the appropriate formulations for a ready-to-apply paint must be developed in the laboratory. This process takes three to five years.

Gutjahr notes the increasing importance of colors in the automotive industry. This is due to the fact that stricter safety regulations are increasingly limiting the manufacturers' design options. Thus, it is becoming more and more difficult for cars to stand out from the competition by their design. The significance of paint as a differentiator is thus increasing. Ideally, the shades offered by a certain manufacturer should be unique to that maker.

Variety of colors

Social trends play a role in the search for popular colors — for example digitalization, sustainability, and individuality. Overall, Gutjahr currently sees a trend toward variety and color. "It should be colorful but not too flashy," says the designer. More and more subtle tones are in demand, which may also range to pastel shades.

In order to make trends visible, BASF experts present key color shades for the major world regions every year. For Europe, they worked out a subtle yellow in 2022, with a dash of ivory mixed in. For South America, there was a copper-beige shade that gives a radiant shine, especially to the small cars that are common there.

When developing new shades, BASF not only works with car manufacturers, but also has to look at the paint technology that comes from companies like Dürr. After all, colors only develop their full beauty when applied correctly from a technical point of view. This is

particularly true for special effects that can be achieved, for example, with an additional layer of colored clear coat. “This lends the color of the car a particular depth,” Gutjahr says.

Dürr ensures that the painting lines of car factories are prepared for such trends. This also applies to paints with pigments mixed in, which refract the light in a special way. They refine the conventional shades of gray, black, or white. These so-called achromatic colors are often ordered for fleet vehicles because they facilitate resale.

“It should be colorful but not too flashy.“

MARK GUTJAHR, DESIGNER AT BASF

Blue like the clear sky

Gutjahr emphasizes that there are various trend colors that differ not only regionally. They also depend on the type of vehicle and its drive. On a global scale, numerous manufacturers are offering new e-cars painted sky blue, according to Gutjahr, adding: “This would have been unthinkable for vehicles with combustion engines.” With e-cars, on the other hand, the color appears clear and clean.

Manufacturers are now also presenting their electric cars in colorful shades, but they like to give them a black roof. Why? The battery located in the floor space often makes e-cars higher, which some consider inelegant. The black roof makes them look lower. For automakers, this two-tone painting requires considerably more resources — unless they use the **Eco**PaintJet developed by Dürr. This innovative application system ensures the razor-sharp application of paint. Time-consuming masking of surfaces that are not to be painted becomes unnecessary, making the process faster and more environmentally friendly.

COSY VALUES
This mix of copper and beige could soon be seen on the roads — especially in South America.

DOXXING BLUE
Light shades of blue do not suit vehicles with combustion engines. Applied on e-cars, on the other hand, the color looks clear and clean.

Why are there walnuts in the Dürr Group?

Finely ground walnut shells make the ideal polishing agent. Thanks to the oil residues they contain, they create perfectly smooth surfaces. At Dürr, this natural product is used in machine manufacturing — to polish so-called bell disks. These are special disks made of titanium that are located right at the front of the painting robot and that create a homogeneous spray jet through fast rotation. Irregularities in the bell disk would lead to an uneven paint finish. To ensure a smooth result, around 100 kilograms of walnut shell granules are used in Bietigheim every year for the perfect polish.

WITHIN THE FRAMEWORK OF SUSTAINABILITY

SUSTAINABLE CORPORATE FINANCING IN THE DÜRR GROUP

GREEN FINANCING	SUSTAINABILITY-LINKED FINANCING
Financing where the funds may only be used for sustainable projects	Financing where the conditions depend on the company's sustainability performance
Which projects are considered sustainable and how is a green purpose demonstrated?	To which sustainability indicators is the financing linked?

LAID DOWN IN

SUSTAINABLE FINANCE FRAMEWORK

The Sustainable Finance Framework links sustainability and financing strategy and was therefore developed on a cross-departmental basis. The interdisciplinary team from left to right: Hanjo Hermann, Daniel Mayer, Simon Engelhard, Marie-Claire Schmid, and Christian Aue.

In order to be able to launch sustainable financing instruments more quickly, the Dürr Group has laid down the basic principles for this in a framework. Christian Aue, Head of Treasury, and Hanjo Hermann, Head of Corporate Sustainability, answer the most important questions regarding the new Sustainable Finance Framework.

TEXT: **HEIMO FISCHER** — PHOTO: **SASCHA FEUSTER**

72 POINTS

were awarded to the Dürr Group in the EcoVadis sustainability rating, to which the company's financing instruments with a total volume of

€1.4 BILLION

are linked. The better the rating, the lower the interest rates. The Dürr Group has achieved Gold status in the EcoVadis rating, placing it among the top 5% of all companies assessed.

Why has the Dürr Group adopted a framework for green financing?

Aue We want to make the principles of our sustainable corporate financing transparent for the capital market. This includes, for example, the question of which sustainability goals we want to be measured against when we issue Schuldschein loans or bonds with a sustainability component.

Hermann With the Sustainable Finance Framework, we are also driving forward the transformation within our own company. That's because the principles set out in the framework enable us to use the money in areas in which we want to become more sustainable. Examples include measures to increase energy efficiency and the expansion of our self-generated electricity.

How can a Schuldschein loan be sustainable?

A We conclude an additional agreement with the Schuldschein buyers: We link the interest on our financing to specific sustainability goals, such as the reduction of our CO_2 emissions. If we achieve the goals, we will pay less interest. This is not only great for us and the environment. Our investors see that we are on the right track when it comes to sustainability — a key component of our strategy — which, in turn, is positive for the Group. If we fail to meet our sustainability goals, we will have to pay more interest. Then the investors are compensated, so to speak, for the fact that we do not meet a target agreed with them.

Why are green financing instruments so important for companies like the Dürr Group?

H The market for green investments has been growing significantly for years. Investors are increasingly looking for investment opportunities in sustainable business sectors. However, demand is rising not only from private and institutional investors, but also from commercial banks. These are attaching increasing importance to a credit portfolio with the lowest possible climate and environmental risks.

A The fact that we are transparent about the sustainable projects in which our funds are invested meets with great approval from the capital market. We expect increased demand for future financing, which should have a positive impact on conditions.

Other companies have already adopted a sustainable finance framework. What is so special about the Dürr Group's framework?

H We are one of the first companies to comply with the new rules of the EU Taxonomy Regulation, which has been in force since 2022. In simplified terms, it represents a Europe-wide classification system that specifies criteria for environmentally sustainable business activities, thus enabling external parties to see how sustainably a company is operating. The associated duty to report does mean considerably more effort. However, we see this as an opportunity because it allows us to show how much we have already initiated in the area of sustainability and what we are still planning to do.

Where do the proceeds from green financing go?

A Our Sustainable Finance Framework stipulates that these proceeds may only be used for projects that comply with the Taxonomy Regulation. These may be photovoltaic systems on the roofs of our buildings, but also the development of sustainable products for our customers. Examples include machine technology for the construction of climate-friendly timber houses and coating systems for the production of batteries such as those required for e-cars. We will report annually on how we use the proceeds from green financing. This is also provided for by our new framework.

The Dürr Group intends to help customers reduce their carbon footprint with its products. How high is the demand for particularly sustainable solutions?

H For a long time, most customers focused on the short-term return on an investment. We have been noticing a shift in attitude for two years now, with more and more customers wanting to know how sustainable a technology is and how it performs over its entire life cycle in terms of CO_2 emissions. This is particularly true for large automotive manufacturers, which now clearly demand sustainable action from their suppliers.

Thank you for the interview.

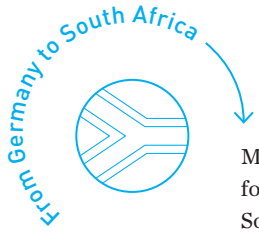
Next stop: abroad

From Mexico to Germany

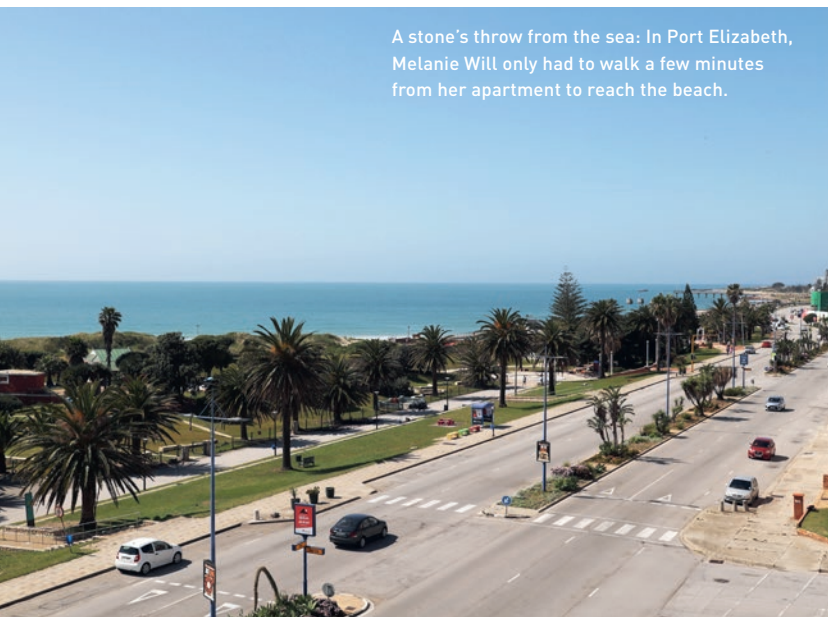
From Germany to South Africa

Melanie Will moved from Bietigheim to South Africa for four months, and Ysaac Pérez came from Mexico to the Dürr headquarters in Germany. During the time spent abroad as part of their trainee program, both gained valuable experience that went far beyond the job.

TEXT: **STEPHAN KÖHNLEIN**
PHOTOS: **MARIE SCHMIDT, YSAAC PÉREZ (PRIVATE)**



Melanie Will jokes that she experienced all four seasons in one single day during the South African winter. It would start with a fresh air of spring in the morning, then it would turn warm and summery around lunchtime, before cooling down in the afternoon, often becoming really cold once the sun had set. Between June and September 2022, the 29-year-old spent part of her trainee program at Dürr in Port Elizabeth, around 750 kilometers east of Cape Town on the Indian Ocean.



A stone's throw from the sea: In Port Elizabeth, Melanie Will only had to walk a few minutes from her apartment to reach the beach.

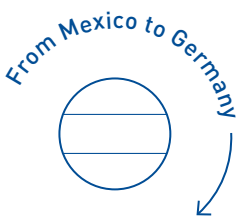
With just under 100 employees, this location, flanked by palm trees, is considerably smaller than the Bietigheim headquarters. Yet it is one of Dürr's oldest foreign subsidiaries. "That's why it has close and long-standing relationships with the local automotive industry," the engineer notes.

Will lived with another Dürr trainee in an apartment overlooking the sea. "Once I even saw dolphins from our window," she remarks. She worked in internal project management in the field of conveyor technology. "My jobs included placing orders with suppliers and preparing internal schedules to establish when we could manufacture and put together certain parts and how to respond to potential delivery delays. This meant I had plenty of contact with local colleagues, suppliers, and customers," she explains.

Perfect for switching off: a walk along the beach at the end of a working day.

"I was very impressed that the CFO made time for me. This set me a good example and it's an attitude I would like to adopt when I take on a leadership role myself one day."

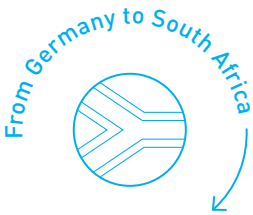
YSAAC PÉREZ,
TRAINEE AT DÜRR



In May 2022, Ysaac Pérez arrived in Bietigheim with mixed feelings of curiosity and nervousness. For the 26-year-old Mexican, it was his first ever stay in Europe. "I knew there were some exciting times ahead for me, but also quite a few challenges," he says. He was a bit worried about the cultural differences between Germany and his home country. But his worry soon dissipated.

After his bachelor's degree in finance, Pérez started as a trainee with Dürr in Querétaro, a city in central Mexico with around 850,000 inhabitants. There, he mainly worked in controlling. "That's my big passion," he says. He wants to work in this field when he finishes his trainee program. In Bietigheim, too, he supported the Controlling and Corporate Accounting department. His tasks included collating information and figures, analyzing them, and preparing them for reporting. He learned the most during joint discussions and his daily work with the relevant colleagues.

According to Pérez, finance is a rather abstract level of business. But he says that the more people you meet and the more insights you get, the more complete the overall picture you're in becomes. He notes that this also includes contact with the management level — not just professionally. "I once went to dinner with CFO Dietmar Heinrich, and another time I was invited to a barbecue," says Pérez. "I was very impressed that the CFO made time for me. This set me a good example and it's an attitude I would like to adopt when I take on a leadership role myself one day."

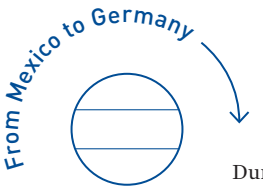


Melanie Will appreciates the openness and kindness of the South African people. “They were really interested, not only in me as a person but also in my professional career and in what I do in my spare time,” she says. After she had mentioned that she liked running, she was immediately put in touch with a running group. She notes that people there are very keen runners anyway. There was a race almost every weekend, but coming together after these runs also played a big part. During these social gatherings, she learned a lot about the country, people, and local wines. That said, it was her trips to the South African national parks that left the most memorable impressions. “The landscape and wildlife over there are breathtaking,” reports Will with enthusiasm.

She did have to get used to the frequent power cuts, which would sometimes happen several times a day, due to the scarce energy supply. That’s when she had to make sure her cell phone was charged overnight so the alarm would work first thing in the morning. And she would clean her teeth by the light of her smartphone torch. Morning coffee? Not a chance! “And in the evening, we would eat a delivery meal by candlelight,” she remembers. Even at work, there was not always enough electricity in all the buildings. “But the people there are flexible and make do,” she says. She has adopted this laid-back attitude for herself — and has come to realize that certain things should not be taken for granted. Will has stayed in contact with South Africa. Aside from the friendships she has created, one reason to go back is the hike in the Drakensberg Mountain Range, which is still on her list of things to do.

> “The people were really interested, not only in me as a person but also in my professional career and in what I do in my spare time.”
>
> MELANIE WILL,
> TRAINEE AT DÜRR

At work, Melanie Will was in constant contact with colleagues and kept an eye on schedules and material deliveries.



During his time in Germany, Ysaac Pérez lived in Stuttgart, the capital of the German state of Baden-Württemberg. On his way to the city train to Bietigheim, he would buy himself a white coffee and a butter croissant from the bakery every morning. “I loved the butter croissants. You don’t get them like that in Mexico,” he enthused. He liked Stuttgart, too, with its architecture, the beer gardens, and the lively Schlossplatz (palace square) in the city center: “I had chosen the perfect time to be there. I was there for the whole summer, from May till August,” he says. He traveled a lot at weekends, to Munich or Berlin, but also to the Czech Republic, Austria and Switzerland.

Even though he was happy and made new contacts in Germany, he still missed his friends and family sometimes, as well as Mexican food with its many spices. He did like the German curried sausage, though, which he declares with a smile.

He also noticed cultural differences at work. “In Mexico, when we get to work on a Monday, we first chat about the weekend and our families,” says Pérez. In Germany you say “Hello. Good morning” and then you start work. That took some getting used to. But it was this focus on the job that he also appreciated. “I would like to live in Europe one day,” he remarks. “This will help me move forward in my career.”

Will and Pérez agree on the message they want to share with other trainees: “Make the most of it, especially your work experience abroad, be open, and ask questions,” advises Pérez. Will says: “But also have fun and use the opportunity to get to know the multiple facets of the Dürr Group.”

Ysaac Pérez, sightseeing in Prague (left) and playing table soccer in his lunch break (below).

THE DÜRR GROUP GRADUATE PROGRAM

With its 16-month trainee program, the Dürr Group offers graduates of different disciplines exciting career prospects. The trainees complete four stages — including one abroad — and receive comprehensive insights into different departments and responsibilities. Their active involvement in shaping the program, along with a permanent employment contract, personal mentoring, wide-ranging opportunities for further training, and networking events ensure that the talented young people gain maximum benefit from their practical training within the company. It is therefore no surprise that the highly qualified young staff are in great demand with the various departments once they have completed the graduate program.

Perfectly integrated: Every week, Melanie Will was out with the local running group.

Dance of colors

A trip to Rio, flying colors, then a dance with the painting robots: The Fantastic 5 artist group has cast Dürr's 125-year history into a spectacular anniversary show. Video artist Gunther von Morgen tells us how the team approached this.

TEXT: **HEIMO FISCHER** — PHOTOS: **SASCHA FEUSTER**

You have developed the show for Dürr with your team. What is so special about the performances of the Fantastic 5?

GvM We dissolve the boundaries between space and time. In the process, the physical and virtual worlds merge. We achieve this with the help of video sequences to which our dancers move on stage in a precisely coordinated manner. In the show for Dürr they throw virtual balls of colored paint into the air, for example. These take on ever new shapes, thus creating a space of unlimited possibilities. I think this image is a good fit for a technology company in the 21st century.

How did you proceed when designing the show?

GvM At first, we took a look at Dürr's history. Our story begins with the founding of the Brazilian subsidiary, Dürr's first step toward becoming a global player. Its entry into the paint shop business, but also topics such as efficiency and sustainability, played a prominent role in the concept. This resulted first in the storyboard and later in the choreography. The videos were produced according to these templates. The dancers then practiced their movements with the videos running in the background. They spent more than 30 hours rehearsing for this. I especially liked the part where they dance the twist with the virtual painting robots.

The film is centered on the founder's grandson, Heinz Dürr, who is one of the Group's most important leading entrepreneurial figures. How did you integrate him into the show?

GvM At almost 90 years of age, Heinz Dürr has experienced a large part of the company's history and narrates the decisive stages in the video. For this purpose, we visited and interviewed him in his office in Berlin. He talks not only about the Group, but also about his entrepreneurial attitude. His prudent and personal style provides an interesting contrast to the otherwise very colorful and dynamic show. When we created the concept, there were long discussions about whether this contrast was too strong. But in the end, we were very happy with the result and the audience reacted enthusiastically as well.

LET THE SHOW BEGIN!
Immerse yourself in the colorful performance of the Fantastic 5.
www.durr-group.com/en/showtime

From top to bottom:
Warm-up for body and mind: Preparation for the performance in the backstage area.
With a Dürr backpack on stage: There is a lot of attention to detail in the anniversary show.
Kit of a different kind: Dancing also depends on the right footwear.

GUNTHER VON MORGEN is one of the pioneers of video art. As early as in the 1990s, he experimented with film and slide shows at concerts and other events. Later, he began to combine video sequences with movements. He founded the artist group Fantastic 5 in 2011.

RIGHT ON THE MARK

Everyone knows that the best information in the company can be found in the office kitchen. That's where Project Manager Kassem Chaou tells us what his work is about.

TEXT: **KASSEM CHAOU** — ILLUSTRATION: **NIKLAS HUGHES**

KASSEM CHAOU
The 48-year-old has been working in project management at Dürr since 2003. When new paint shops are designed and built, he keeps track of things. Despite dealing with contracts worth millions, tight deadlines, and supply chain bottlenecks, he manages to keep a level head.

My typical working day begins with a meeting, where I am joined by colleagues from very different areas: Controlling, Technical Design, HR, or Taxes. This mix gives you an idea of the complexities involved in project management at Dürr. We design and build paint shops for automakers all over the world.

Our customers are willing to pay good money for this. The order value usually ranges between 20 and 200 million euros. It is vital that nothing goes wrong. Tons of steel, miles of cables, robots, control cabinets, and a lot more must be on site at the right time. It ultimately falls to me to ensure that every work stage can start as scheduled. This requires functioning supply chains. Since 2020, this has become an ever-increasing challenge. But so far, everything has worked out.

Adherence to schedules is very important for our customers. When the contract is signed, the deadline for when the plant goes into operation is already set. Within the project team, we work toward this deadline for months and, in many cases, even years. I will never forget the order we had from the Vietnamese automaker Vinfast, which established its first factory in 2018. Our job was to build the paint shop. Normally, this kind of project takes between 16 and 18 months. The customer gave us 12. It was rather ambitious.

Together with an international team, we looked for suppliers, conducted interviews in the hotel lobby in Haiphong, and stayed in the bar late into the night to do our planning. It was a hell of a project. Some said we'd never manage it. But we never lost our confidence, and in the end we were right on the mark. Production could start on the scheduled day.

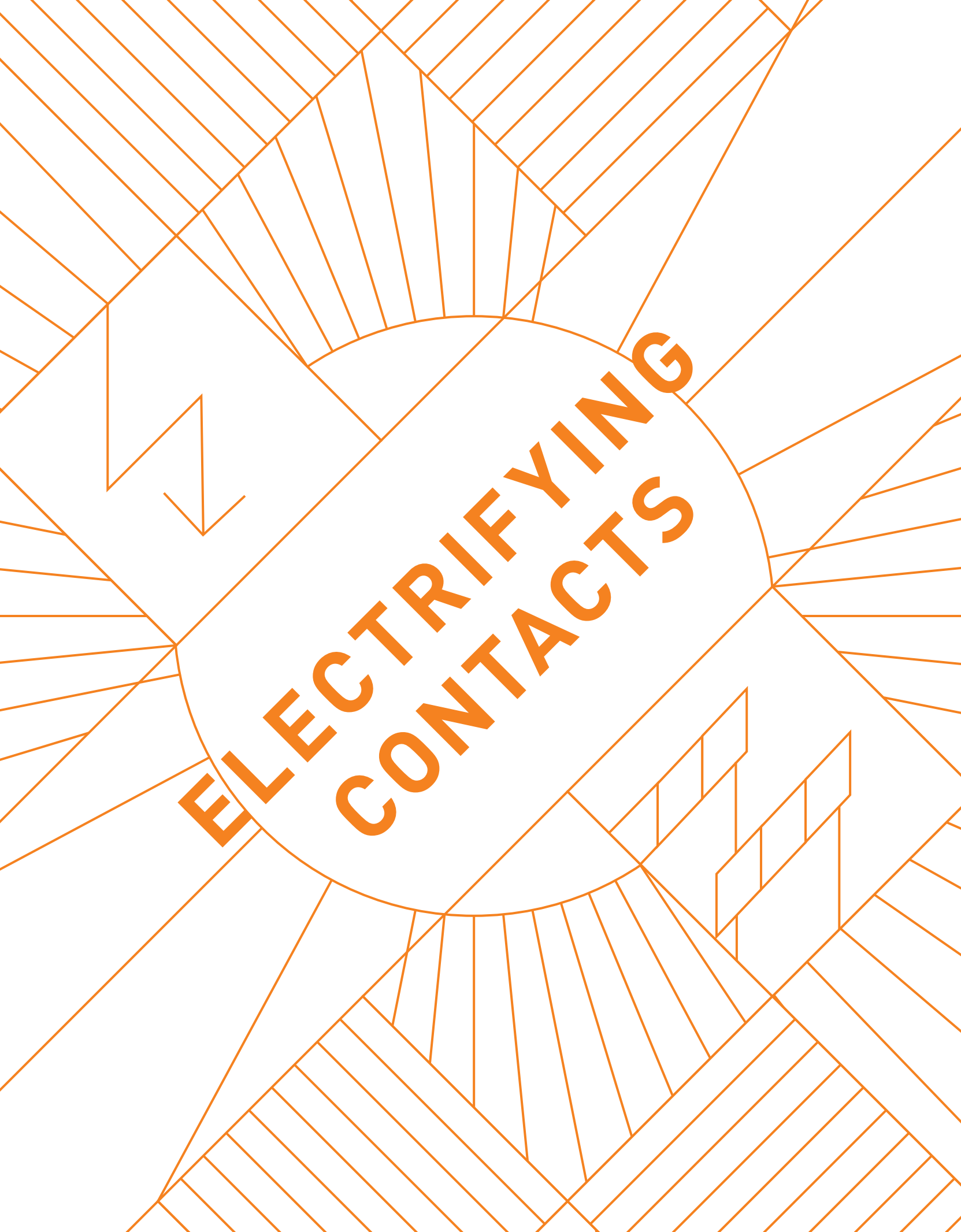
Project managers need not only technical knowledge, but also diplomatic skills and sensitivity to go with it. Some customers have special wishes that are not part of the contract. When this happens, I have to break it to them gently that the project will be more expensive. I can never lose sight of the profitability of a project.

At Dürr, it is normal that young project managers are given a responsible task early on. When I started here as a business management graduate 20 years ago, I was put on a flight to Alabama six weeks later. That is the US state where Hyundai wanted to build its first large foreign factory. Dürr was to deliver the paint shop. I stayed there for three years as part of a team. After that, I went straight to Korea. I have also done stints in India, Brazil, and China.

Now I am a Senior Project Manager. That's a job in middle management with good opportunities for development. Currently, I am not spending time abroad. On the contrary: I am supporting the construction of a new paint shop at Audi in Neckarsulm — that's only half an hour by car from our headquarters in Bietigheim. Quite unusual in my job.

Why is it not just cars diving into the dip tank?

Before a car is painted, a base coat is applied to protect against corrosion. To this end, the car body is immersed in a dip tank. If several vehicle models receive their base coats in the same plant, the nozzles in the tank must be set to ensure that the coating quality is right for each car body. To speed up this process, the BMW Group in the German town of Dingolfing wanted to send industrial divers under water. Those in charge discussed the idea with Dürr. Two recreational divers from paint shop engineering got wind of this plan and took on the unprecedented task. In full diving gear, the Dürr employees jumped into the dip tank to set the optimal nozzle pattern.


ELECTRIFYING
CONTACTS

The energy crisis is enabling a comeback for the European solar industry. Good for companies such as Teamtechnik. The Dürr subsidiary builds machines that interconnect individual solar cells at lightning speed so they can be put together to create large modules.

TEXT: **HEIMO FISCHER** — PHOTOS: **SASCHA FEUSTER, JAN OELKER**

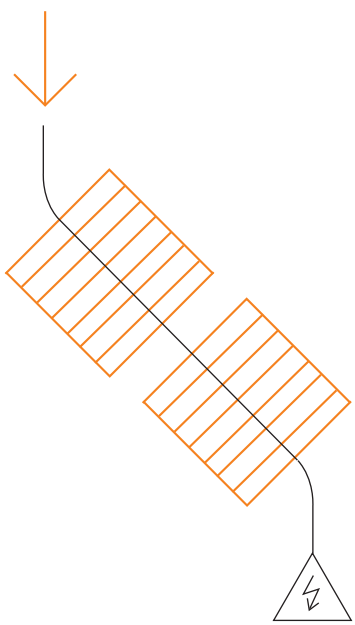
Metal frames are gliding on conveyor rails, lights are flashing, and vacuum grippers are dancing in a uniform rhythm. A layperson would scarcely notice what tasks are being completed by these complex machines, built by Teamtechnik in the German town of Freiberg am Neckar. Only the solar cells, stacked in the factory building for demonstration purposes, indicate what type of sector the buyers come from.

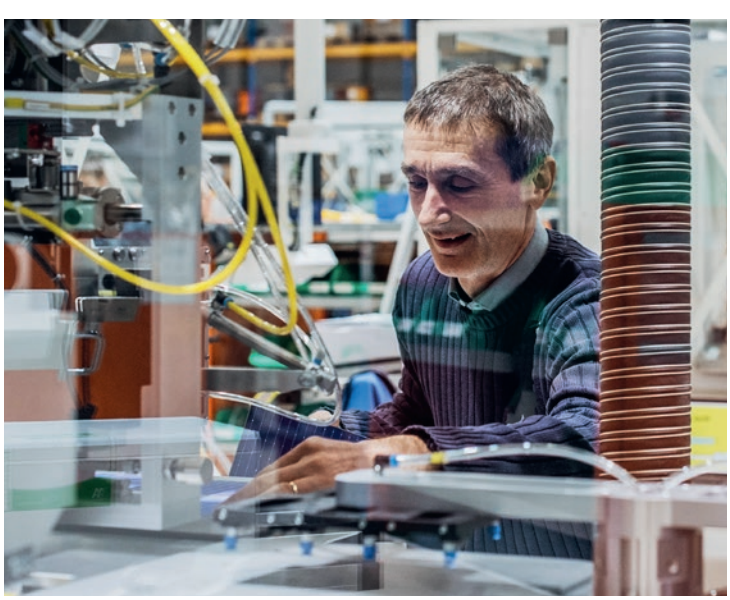
The Dürr subsidiary produces specialized machines for the solar industry. These so-called stringers interconnect individual solar cells. The strings thus created are later assembled to produce complete modules and can eventually be found in photovoltaic systems on roofs and on open land. “Since solar modules are needed in large quantities, production must be fast and highly automated,” says Thomas Fischer, Head of Mechanical Design & Technology Development.

The machines built by Teamtechnik help to meet the rapidly growing demand for solar technology, since photovoltaics, along with wind power, are crucial in achieving climate targets. In addition, solar power can be harnessed more and more cost-effectively. This is partly why global generating capacities increased tenfold between 2012 and 2022. The sector anticipates a further increase, with figures expected to double by 2025.

Energizing connections

During a tour of the manufacturing facility, Fischer explains how the machines work. “The stringer places the fragile solar cells next to each other. These are then connected in series, with a copper wire placed onto them and soldered to the silver contacts located on each cell.” In the finished solar module, this connection enables the outflow of electricity harnessed from sunlight. This production stage poses a challenge: It must be completed quickly yet accurately and reliably. That’s no problem for Teamtechnik. Even though the positioning of wire and cells needs to be accurate to within a fraction of a millimeter, the systems are run with cycle times of under two seconds.





ALL RUNNING SMOOTHLY in the Teamtechnik production facility? Thomas Fischer regularly makes sure of this.

What gave the company the idea to manufacture stringers? The beginnings date back more than two decades, according to CEO Stefan Roßkopf. At the time, the automation specialist was looking for new business ideas. In the years after its foundation, Teamtechnik was mainly building individual, special systems tailored to customers' needs. Now, the plan was to add more standard machines — these would be produced in large quantities for a wide customer base and make the resources linked to each order more straightforward. "That's why we sounded out various markets in the early 2000s," says Roßkopf.

The promising market of renewable energy attracted the interest of Teamtechnik's technology scouts. When looking at the production of solar modules, they were baffled: In numerous factories, hundreds of employees were still soldering solar cells manually in order to connect them.

The Teamtechnik management decided to find a simpler and quicker way. It was actually an obvious idea — which nobody had consistently pursued up until then. "We knew that this was right up our street," says Roßkopf. A team of developers got to work.

A successful business idea

In 2005, Teamtechnik launched the first stringer. Two years later, the company was able to produce the machines in series. It was especially the growing Chinese solar industry that was keen to get its hands on the technology from Freiberg am Neckar. "In 2011, we were world market leader," says Roßkopf. Back then, five machines would leave the company each week. Stringers made up around 60 percent of Teamtechnik's sales.

Then, competitors in Asia started building these specialized machines themselves, while in Europe government incentives for the solar industry were being reduced. Even though sales of stringers declined, Teamtechnik was not discouraged and continued this business on a small scale.

Since then, a new generation of solar cells has come onto the market. The cells generate more electricity per square meter, with the downside

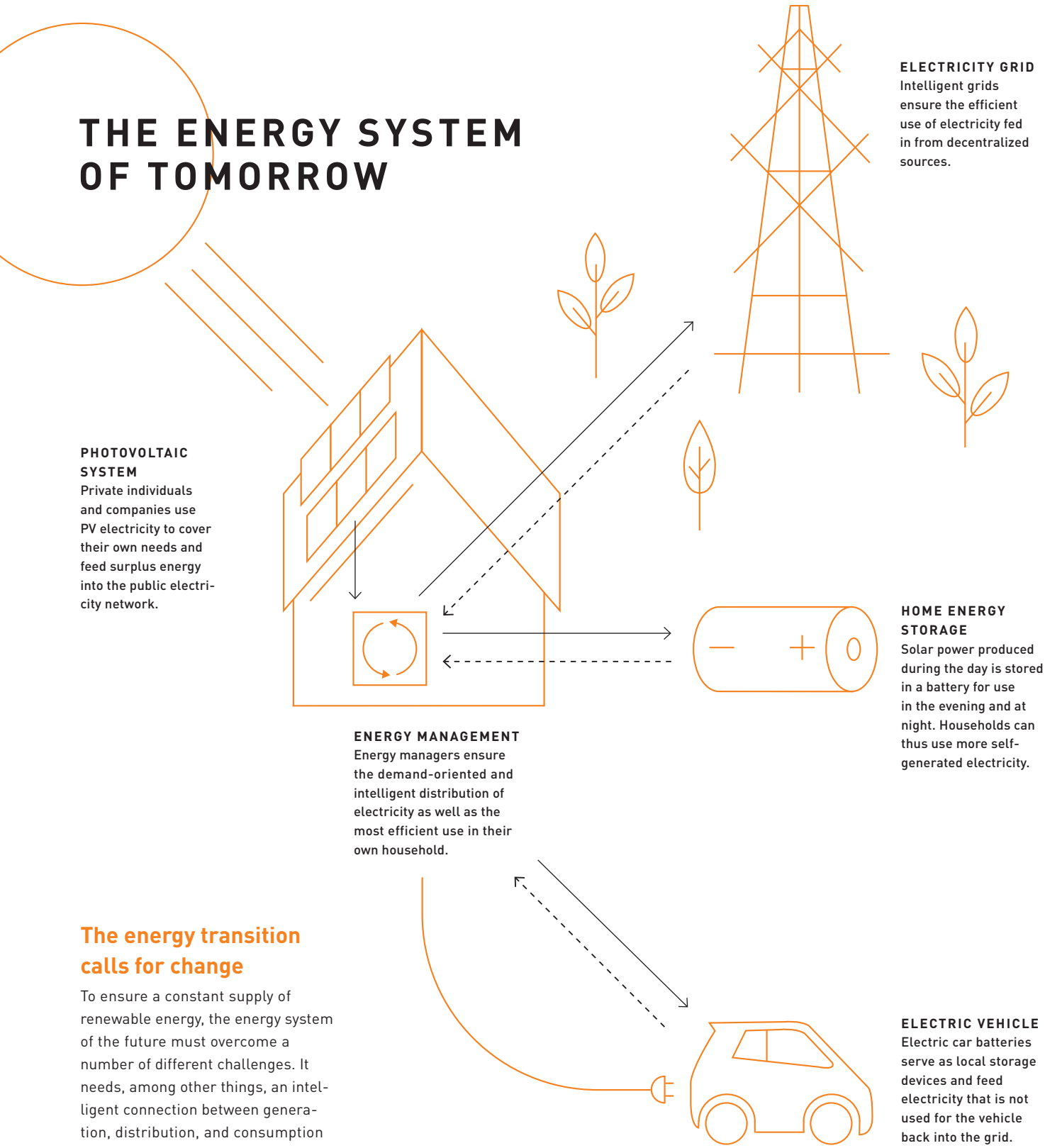
"We knew that this was right up our street."

STEFAN ROSSKOPF,
CEO TEAMTECHNIK

TIGHTLY PACKED, the stringer systems are waiting to be delivered to the customer.

SOLAR ENERGY
is one of the most important renewable energy sources. Innovative installations such as floating photovoltaics offer potential scarcely exploited on a global level until now.

THE ENERGY SYSTEM OF TOMORROW



ELECTRICITY GRID
Intelligent grids ensure the efficient use of electricity fed in from decentralized sources.

PHOTOVOLTAIC SYSTEM
Private individuals and companies use PV electricity to cover their own needs and feed surplus energy into the public electricity network.

HOME ENERGY STORAGE
Solar power produced during the day is stored in a battery for use in the evening and at night. Households can thus use more self-generated electricity.

ENERGY MANAGEMENT
Energy managers ensure the demand-oriented and intelligent distribution of electricity as well as the most efficient use in their own household.

ELECTRIC VEHICLE
Electric car batteries serve as local storage devices and feed electricity that is not used for the vehicle back into the grid.

The energy transition calls for change

To ensure a constant supply of renewable energy, the energy system of the future must overcome a number of different challenges. It needs, among other things, an intelligent connection between generation, distribution, and consumption of electricity. The storage of energy also plays a key role because more renewable energy means more volatility in the grid.

that they cannot tolerate the 200 degrees Celsius necessary for soldering. Together with the Fraunhofer Institute for Solar Energy Systems ISE, the Teamtechnik experts have found a way to connect solar cells using an electrically conductive adhesive. Now, in simple terms, new machines apply the adhesive in exactly the right places with the help of a fine-mesh screen.

The solar industry comeback

This kind of innovation is well received. Around 20 of the new machines are going to a customer who is putting a solar module factory into operation in Italy in 2023. Next year there is the possibility of more large orders. Roßkopf is optimistic. "The Western solar industry is on the rise again."

This has several reasons. For one thing, the oil and gas shortages are creating a new tailwind for the solar industry. In addition, companies are seeking to become independent of suppliers from other parts of the world. Furthermore, the United States is currently pumping billions of dollars into the renewable energy sector to fight inflation and boost its economy.

Roßkopf reckons that the shift in the energy world will continue to have a positive effect on Teamtechnik's business. This is because Teamtechnik also manufactures assembly and test systems for batteries, which are used, for instance, in electric vehicles and home energy storage. This means the company is involved in important points of tomorrow's energy system.

It is thus already possible for solar power not only to be fed from the roofs of residential buildings into the local grid, but also to be stored locally in the basement or sent directly to the electric car in the garage. The car battery could, one day, even be used as a storage device to lighten the burden on the national grid.

It is not only the energy sector that has come to rely on the Dürr subsidiary's products, but also the aerospace industry. Satellites launched into space obtain their electricity from solar sails, i.e. photovoltaic systems. One thing that Roßkopf is particularly proud of is that the solar modules they contain are increasingly manufactured using machines from Freiberg am Neckar.

SUNNY TIMES

The sun is one of the most important energy sources of the future. Dr. Achim Kraft from the Fraunhofer Institute for Solar Energy Systems ISE sees huge potential for solar technology — provided that the companies in this industry continue to drive its development forward through innovation.

Just 20 years old, the photovoltaic industry is a very young sector. Nevertheless, it already boasts some remarkable achievements. With levelized costs of electricity of around 6 €ct/kWh, photovoltaics are among the most cost-efficient of energy sources. It is particularly in regions with high solar radiation where PV energy has already overtaken coal, gas, and nuclear power.

Going forward, the demand for electricity will rise steeply because households, vehicles, and industry are gradually replacing fossil fuels with electric-power-based technologies. It is estimated that Germany alone will require between 300 and 450 gigawatts of installed photovoltaic capacity for a fully regenerative energy system. Today, it has around 60 gigawatts.

To achieve this goal calls for enhanced products and more efficient processes. Thus, solar cells are becoming thinner, which saves material but requires new processing methods. In addition, more efficient solar cell technologies are being developed, such as the tandem solar cell. To interconnect these new-generation heat-sensitive cells, an electrically conductive adhesive is already in use today. This technology has additional benefits. An adhesive joint is more flexible, thus enabling it to absorb more thermomechanical stress than a solder joint. Dispensing with soldering also means there is no longer any need for lead.

These examples are just a taster of the opportunities that exist to make photovoltaics even better. They illustrate the importance of commitment, pioneering spirit, and the close cooperation between industry and research in this field. In the case of Teamtechnik, this has already paid off. It is partly thanks to the adhesive technology jointly developed with Fraunhofer ISE that Teamtechnik last year recorded its largest photovoltaics order in the company's history.

HIDDEN JEWEL

The Group subsidiary BENZ Tooling is located in a Black Forest valley. The specialist for tooling systems and machine technology supplies future-oriented industries in Germany and abroad. Now, this hidden champion is opening up new sales areas.

TEXT: **HEIMO FISCHER** — PHOTOS: **SASCHA FEUSTER**

HASLACH IM KINZIGTAL
A sleepy village? On the contrary. Here, people work with an alert mind and great commitment on tooling and machine technology for the world market.

A river meanders through the valley, there are farms on the slopes, and the old town features a church, a town hall, and old half-timbered houses. At first glance, Haslach im Kinzigtal looks like the cliché of a rural Black Forest idyll.

But the picturesque setting should not hide the fact that the town is located in a flourishing industrial region. With world-renowned companies. And hidden world market leaders. Among them is BENZ — a subsidiary of the Dürr Group, specializing in precise tooling systems and machine technology.

Angle heads, motor spindles, and rotary distributors are some of the products that are shipped from Haslach to customers all over the world. The combination of local ties and modern technology is part of BENZ's identity, according to Managing Director Martin Schreiber. "Regionally rooted, internationally successful" is how he describes the company's credo.

Schreiber is a manager with international experience, who worked in Asia for a long time. At BENZ, he appreciates the special atmosphere in everyday working life. "I am fascinated by the company's technologies, the ingenuity, and commitment of the people here," says the 55-year-old.

"We are regionally rooted and internationally successful."

MARTIN SCHREIBER,
MANAGING DIRECTOR BENZ

During the tour with Schreiber, visitors also get a sense of the family atmosphere. He keeps stopping, shaking hands, and knows the first names of his employees. In turn, they address their boss as "Martin."

Schreiber greets Katharina, a young colleague who is assembling a motor spindle for woodworking. A rather complicated aggregate consisting of a drive, sensors, many cables, and precise mechanics. Once the spindle is finished, it can very efficiently perform various drilling processes and create recesses. Customers use them, for example, in machines for the production of fitted kitchens.

The enablers

BENZ manufactures various machining units for industrial customers according to their needs. In many cases, the requirements are so special that other manufacturers have to pass. BENZ, however, specializes precisely in such cases.

To explain what kind of challenges the experts must overcome here, Schreiber uses the model of an aluminum case that normally encloses the battery of an e-car. The manufacturer has designed it in such a way that holes for screws or pins are located even in places that cannot be reached without special tools. "In such cases, for example, we design a unit that can be used mechanically to drill 'around the corner'," Schreiber explains.

The demands placed on the precision of the tools are enormous. Sometimes it comes down to a thousandth of a millimeter. Seals in vehicles, for example, must be one hundred percent tight. That's why a major Chinese electric vehicle manufacturer is among the companies that rely on the precision specialist from the Black Forest. "Even though the new electric drives eliminate processing tasks in combustion technology, they do offer the potential for new tasks as well. That is partly a blessing for us, depending on how you approach the matter," Schreiber says optimistically in view of the changes in the automotive industry.

In addition to the automotive and woodworking industries, medical technology, aviation, and wind power are among the promising industries whose companies rely on BENZ products. BENZ assemblies can be found in machining centers of carpentry workshops and in fully automatic production lines. Sometimes, the company receives very unusual orders, for example from the energy industry, where customers manufacture key components using BENZ technology. Schreiber reports about a power plant engineering company that had to manufacture a turbine as tall as a house for millions of euros. For a crucial drilling job, BENZ developed and produced a customized large drill head.

Customized products are part of the company's DNA. When Xaver Benz founded the company in 1946, he initially repaired agricultural equipment in the stables belonging to a restaurant. However, he soon focused on parts production based on drawings. In the period of the German economic miracle, adjusting and clamping sleeves were produced. In the 1980s, the company boomed with the production of angle and large drill heads. Later, the range was expanded to include technologies combining mechanics and digital electronics, such as aggregates

offering automatic tool change. In a single production step, these can be used to carry out various jobs at lightning speed. The workpiece is only clamped once, which saves time.

Impressive training rate

Manufacturing such digitally controllable assemblies requires experience and concentration. “For this, we need talented experts who enjoy working things out and implementing them,” says Schreiber. BENZ makes every effort to find talented young people and trains them to become skilled workers. Almost one tenth of the staff are apprentices.

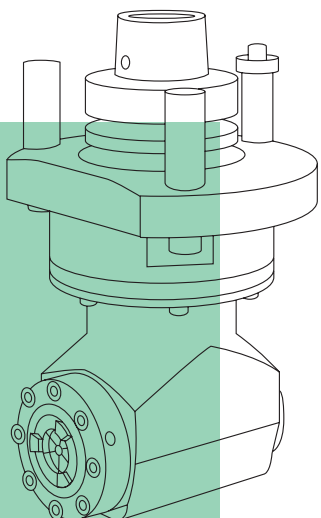
Ivo Reinberger monitors their selection. More than ten years ago, he himself was an apprentice at BENZ; now, he is responsible for industrial training. Reinberger also organizes collaborations with schools. Every Tuesday, a class comes to the company to have lessons in technology. Some of those students are later hired as apprentices. “The shortage of skilled workers is not yet a big problem for us,” says the 32-year-old.

This is also because BENZ promotes cohesion among the workforce. For example: Those who have landed an apprenticeship are invited to a company tour followed by a barbecue dinner — and they may bring their parents along, too. “The atmosphere in the company is very friendly. Many employees also know each other privately, which creates trust,” confirms Jasmin Eble, who grew up ten kilometers away. She recently completed her apprenticeship as an industrial clerk and now works in marketing.

Melanie Neumann feels similarly about the atmosphere. The trained industrial mechanic works in the assembly department. For her, too, BENZ is a big family. Her brother is a working student and her father also works here. “He used to take me to the company a lot when I was a kid. That’s why I knew what to expect from the apprenticeship.”

A LOOK BEHIND THE SCENES
At BENZ, the training workshop is integrated into production. Accompanied by Ivo Reinberger, Head of Industrial Training (on the left in the right picture), the apprentices are thus greatly involved in day-to-day business right from the start.

CLOSELY CONNECTED
Like Jasmin Eble, many employees feel a strong connection — to the region, the company, and each other.



Now it's getting crowded

There is plenty to do for the 300 employees. Business in Asia is growing, order numbers are increasing, and sales are around 60 million euros. For CEO Schreiber, success is also a challenge. "Strictly speaking, our capacities are only sufficient for 50 million euros of sales." The workshops and offices are correspondingly packed.

For this reason, BENZ is building new company headquarters in Gengenbach, a 20-minute drive away, with production and assembly facilities that will allow for further growth. "We want to create an attractive and contemporary work environment," says Schreiber. Employees are closely involved in the planning of the new location. Since many people in the administrative area work partly from home, there will be freely available workstations based on the desk-sharing principle. Individual offices will also be a thing of the past.

The flexible working environment saves space, energy and money. Obviously, he won't have a fixed workstation either, Schreiber says. "I don't want to retreat to an office that I have all to myself." He thinks that a manager must always be exactly where he is needed. That is true all over the world — including in the Black Forest.

300
EMPLOYEES

AROUND
€60 MILLION
IN SALES IN 2022

BENZ Tooling is one of the world's leading manufacturers of tooling systems and machine technology for machining metal, wood, and composite materials. With a great deal of experience, precision, and flexibility, the internationally operating company develops high-quality solutions tailored precisely to its customers' requirements.

Say goodbye to messy paperwork!

The productionManager, HOMAG's digital job folder, always shows carpentry workshops and joineries the current status of orders.

TEXT: **HEIMO FISCHER**

Whether they have 10 or 100 employees, many companies still use paperwork in everyday operations. Let's assume, for example, that a customer makes a last-minute decision to change the cabinet on order to a white instead of a gray one. In such a case, the information is often written down on a piece of paper and passed on to the person in charge. If everything goes smoothly, the change will be accommodated in production. But what if the note is lost or the information is forgotten? Then chaos is inevitable.

The Binsch carpentry workshop from Baden-Württemberg knows this issue all too well. During a large project with many components, the overview was lost at some point. It was almost impossible to keep track of what had been manufactured, painted, finally assembled or already installed on the construction site. "We expect the productionManager to provide us with transparent parts tracking," says Julian Roob, Head of Work Preparation and Project Manager at Binsch. The carpentry workshop has been using the web app since the summer of 2022. An initial appraisal came to a positive conclusion.

Instead of loose slips of paper, any order changes and progress are recorded directly in the productionManager for everyone to see. This enables traceable and consistent workflows — from work preparation to production. Everyone has the same, up-to-date status and knows where which order is located. Employees can see on their tablets or computers which components and articles need to be processed next. This allows them to get straight to work, without time-consuming handover meetings.

Tracking the progress of orders in real time — that is what Manuel zum Buttel, founder and Managing Director of ZB Holzsysteme, also wanted to do. And not just in the executive office, but throughout the entire company. "The crucial point was to keep an eye on the whole order," says zum Buttel, explaining the decision in favor of the productionManager. "No other system offers this level of transparency."

The productionManager is tailored to the needs of small and medium-sized companies, as Hendrik Albers, software expert at HOMAG, explains: "The web app is intuitive to use and doesn't require a lot of onboarding. In addition, it can be integrated into any existing workshop environment." This means that the productionManager is also an interesting option for companies that don't have HOMAG machines. Because nobody needs messy paperwork in the carpentry workshop.

GOLD RUSH IN TIMBER HOUSE CONSTRUCTION

Using wood in construction is standard practice in North America. But the industry is facing a problem: There is a shortage of workers, even though the construction market is expected to grow. That's why US companies are promoting the production of floor and wall panels in highly automated facilities. The HOMAG Group can provide the appropriate technology.

TEXT: **HEIMO FISCHER** – PHOTOS: **ISTOCK, WEINMANN**

STICK FRAMING currently remains the typical, very labor- and time-intensive construction method in the US.

Every region of the world has its own way of building. In North America, it usually looks like this: Trucks unload timber, workers assemble the beams and battens on site. These are used to build walls and then entire houses. Building with brick and mortar? That is very rare in North America. The timber construction rate is 85 percent. Almost all houses are built manually – a traditional but laborious method. Sometimes, there are up to 60 people working on a construction site.

But it is uncertain how long this approach will continue to be widely used, because the construction industry in the US is faced with a problem: There are not enough qualified workers. This is mainly due to the consequences of the real estate crisis that shook up the construction sector after the 2008 financial crisis. Many experienced professionals moved to other fields at that time. The industry has still not recovered from this blow. In addition, stricter visa requirements for skilled workers from abroad are further aggravating the staff shortage.

Technology for affordable housing

At the same time, people in numerous regions of the US are searching in vain for affordable homes. According to estimates, there is a shortage of around five million apartments and houses nationwide. Constructing these buildings in the traditional way seems unrealistic in view of the staff shortage. So, what can be done? "Prefabrication and automation can make a decisive contribution to solving the problem," says Darrin Schramm. The sales expert works at Stiles, a company which is part of the HOMAG Group and sells woodworking technology to the North American market.

This also includes software-controlled machines and systems that can be used in factories to manufacture walls, floors, ceilings, or roof trusses quickly and fully automatically from timber. Trucks then transport the components to the construction site, where they are assembled into a complete house in just a few days. "Faster, more precisely, and with fewer personnel than would ever be possible with manual labor alone," says Schramm.

Investors with business acumen

Many North American business professionals share this view. Forest owners, timber merchants and sawmill operators are entering the timber construction business to create affordable housing on automated production lines. "They're either building their own production facility or buying an existing construction company and modernizing it," Schramm says.

To that end, they need expertise and the right technology. HOMAG also offers machinery and systems for timber construction in North America under the WEINMANN brand. The Schuler Consulting company, which is part of HOMAG, helps new entrants to set up production and select suitable equipment. Often inexperienced, the factory workers can attend seminars at the WEINMANN Academy, where they learn how to properly operate the sophisticated technology.

1.5 MILLION

TIMBER BUILDINGS ARE CONSTRUCTED IN THE US EVERY YEAR.

> 90%

OF SINGLE-FAMILY HOMES IN THE US ARE MADE OF TIMBER.

TRAINING FOR SKILLED WORKERS is as important as the right technology when setting up factories for serial timber construction.

> **"Prefabrication and automation can make a decisive contribution to solving the staff shortage problem."**
>
> DARRIN SCHRAMM, SALES MANAGER AT STILES

Until now, the machines and systems have been manufactured exclusively in Germany and Poland. That is about to change. Going forward, instead of sending heavy equipment across the Atlantic, HOMAG intends to run its production as close to the customer as possible. This saves shipping costs, reduces the carbon footprint, and ensures short delivery times, which are very important to US customers. That's why an alliance has been formed under the umbrella of the Dürr Group as the parent company, to drive the project forward. It includes WEINMANN and Stiles, but also Dürr Mexico.

The North American subsidiary is based in Querétaro, a three-hour drive northwest of Mexico City. The experts there have extensive technical know-how. "We can build on this knowledge to manufacture machines and systems for the production of timber construction elements," says Evelia Reyes, HOMAG Country Manager at Dürr Mexico.

The plan is to initially manufacture assembly tables in Mexico, as these currently have the longest delivery times. On the tables, timber elements are assembled into frames. These timber frames can be turned on the movable assembly tables, filled with insulation material and covered — and the wall is finished.

In order to make the existing WEINMANN products fit for the North American market, they must be adapted to design and material standards in the US and Canada. This work is carried out by the design experts at Dürr Mexico.

Space is running out

Production is scheduled to start this year. "As of July, we will be starting with eight tables per month for a customer project in the US," Reyes says. It is envisaged that initially 13 employees will work for the new segment of Dürr Mexico. By 2027, this number is expected to double.

No wonder space is running out in Querétaro. As a result, the new business segment will move into its own building a few kilometers away as early as mid-2023. The staff is very proud of the subsidiary's growth, according to Reyes. She promises: "We are highly motivated and will make the project a success."

What do ketchup and paint have in common?

How about paint on chips or ketchup on cars? The commonalities don't quite stretch that far. The one property they do have in common is something many people know from everyday life: When you open a glass bottle containing ketchup and turn it on its head, nothing happens initially. Shaking the bottle first, however, makes the condiment come out more easily. Paints also become thinner when agitated and are thus easier to move and atomize. After a short rest phase, both ketchup and paint return to their former, thicker consistency. This is to ensure that they do not continue to spread where they are not wanted on the plate or car body. This property is referred to as thixotropy.

IN BRIEF

Comfortable *upcycling*

At Dürr Brasil in São Paulo, employees have access to a very special meeting room. The “sala sustentabilidade” (“sustainability room”) is furnished with furniture built by the employees. Disposable wooden pallets from assembly, which are usually discarded, were transformed into stylish furnishings with a great deal of creativity and craftsmanship. It was the idea of four employees who wanted to take a stand against wasting resources and make a contribution to protecting the environment.

Space mission *or pest control?*

Neither nor. The picture was taken when the Cellforce Group, a joint venture between Porsche and battery specialist CUSTOMCELLS, put into operation a coating system for electrodes — a core technology in the production of electric car batteries. The cleanroom suits were mandatory for Dr. Markus Gräf (Managing Director/COO Cellforce), Michael Steiner (Member of the Board of Management Porsche AG) and Dr. Jochen Weyrauch (CEO Dürr AG) (from left to right). At Cellforce Group, a special process provided by Dürr is used that enables the simultaneous coating of both electrode sides: Graphite is mostly used at the anode end, while the cathode end is usually coated with a mix of nickel, manganese, cobalt, and lithium. In conventional coating systems, the anode and cathode material is not applied at the same time, but one after the other. Dürr’s simultaneous coating accelerates the process and significantly increases precision and quality.

Swapping suits *for overalls*

In order to better understand the tasks and challenges of production, member of the HOMAG Board of Management Dr. Sergej Schwarz spent one day working alongside the colleagues from pre-assembly and commissioning. During the short internship at the Schopfloch location, the engineer rolled up his sleeves to help. His tasks included assembling the machine bases and equipping the processing units.

350 ideas *for the climate*

In addition to politics and society, companies must also make an active contribution to reducing greenhouse gas emissions. For three days in November 2022, the Dürr Group therefore focused on ideas for environmental and climate protection. More than 700 employees throughout Germany took part in the so-called Ideation Jam. A total of 350 ideas for more sustainability in the product range and at the locations of the mechanical and plant engineering firm were submitted, discussed and further developed during the online brainstorming session.

In a party mood

Dürr India celebrated its silver anniversary in 2022. The subsidiary started out in Chennai in 1997 with ten employees. Today, there are more than 350 staff working for the company across four sites. To celebrate this successful growth, Dürr India threw a big party. The employees proved that they give their all not only in their job but also on stage, delivering well-rehearsed performances to contribute to the event.

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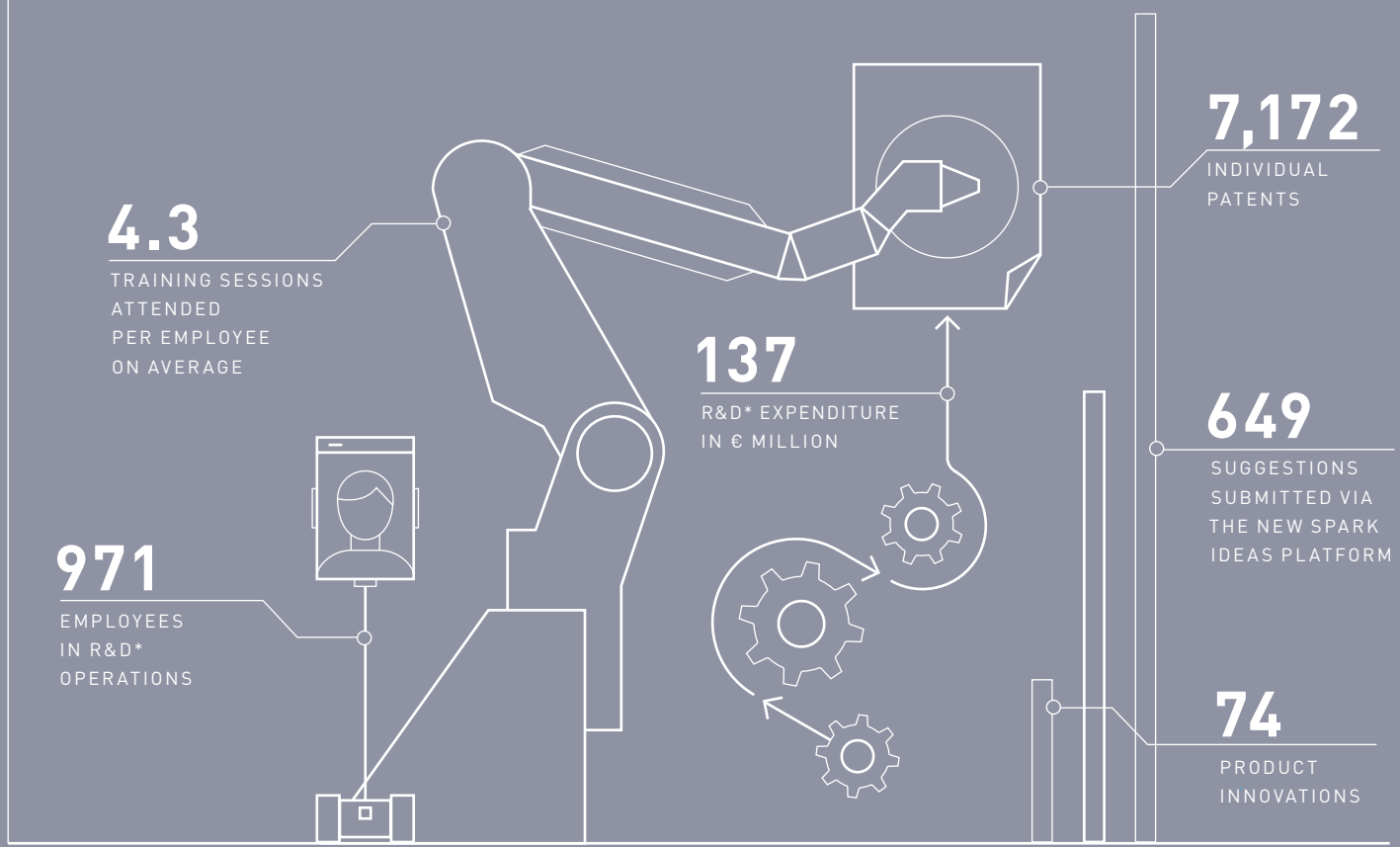
COMPANY PROFILE

The Dürr Group is one of the world's leading mechanical and plant engineering firms with extensive expertise in automation and digitalization/Industry 4.0. Its products, systems and services enable highly efficient and resource-saving manufacturing processes in different industries. The Dürr Group supplies sectors like the automotive industry, mechanical engineering, chemical, pharmaceutical, medical technology and woodworking industries. It generated sales of €4.3 billion in 2022. The company has about 18,500 employees and 123 business locations in 32 countries. The Group operates in the market with the brands Dürr, Schenck and HOMAG and with five divisions.

CURIOSITY PAID OFF IN 2022



* R&D: Research and Development