UPDATE

The Phoenix Contact
innovation magazine

Air

Air pollution

4.5 million

people die worldwide from air pollution each year
(Source: Centre for Research on Energy and Clean Air, 2020)

Records

11 minutes

and 35 seconds, the length of time Frenchman Stephane Mifsud held his breath in June 2009 – a world record

24 minutes

and 3 seconds, the length of time the Spaniard Aleix Segura held his breath with pure oxygen in February 2016 – a world record

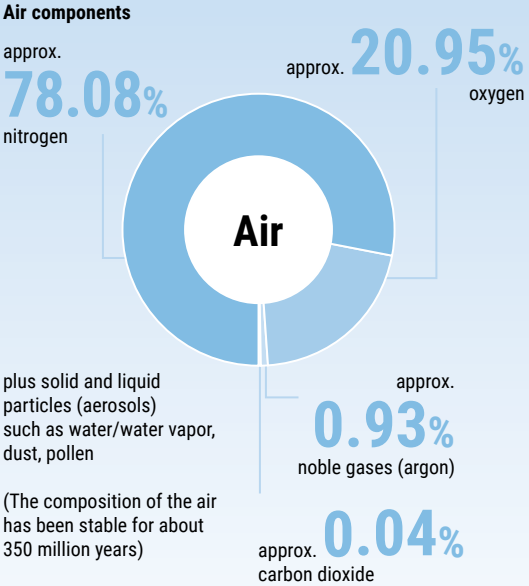
16 billion kWh

of wind power was generated in Germany in January 2022 (onshore and offshore)
(Source: IWR Institute for Renewable Energy Economics)

Wind speeds

650 km/h	The speed of the jet stream (and thus the fastest natural movement of air)
408 km/h	The strongest wind ever measured on the earth's surface during a cyclone over Barrow Island (Western Australia)
335 km/h	The speed of the strongest gust measured in 1985 on the Zugspitze peak

Air components



(The composition of the air has been stable for about 350 million years)

Compressed air mobility

1840

The year the first compressed air car was designed and unveiled in Paris by Adraud and Tessié du Motay

2008

The year the concept vehicle Tata ONECat was unveiled (5 seats, top speed 100 km/h, 90 km range)

1879

The year the first compressed air-powered tram was commission by Louis Mékarski in Nantes, France

Exosphere/space
No clear separation

Thermosphere up to
500 km

Mesosphere up to
80 km

Troposphere up to
15 km

Stratosphere to
50 km

Till Potente,
Vice President Operations and Sustainability
at Phoenix Contact Electronics GmbH

Air and passion

Dear readers,
With "Air" being the topic of this issue, our shared journey through the four elements is coming to an end. After showcasing water, earth, and fire, this issue of our customer magazine will focus on the versatility of the products and solutions from Phoenix Contact when it comes to our atmosphere.

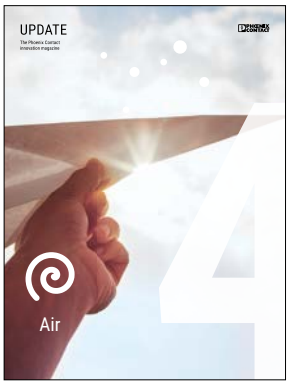
One of the most exciting technological endeavors of our time deals directly with our atmosphere. The Swiss company Climeworks filters climate-damaging carbon dioxide from the atmosphere and makes it available for reuse or stores it in rock several hundred meters below the earth's surface. The innovative company also relies on technology from Phoenix Contact.

We will also be going in the other direction – that is to say, high up, where Ferris wheels turn. To ensure that this happens reliably and, most importantly, safely, one of the world's leading companies in show business uses our products.

While size is what counts with the Ferris wheel, the award-winning NearFi coupler (page 26) involves much smaller distances. But bridging a centimeter-sized air gap is groundbreaking for data and power. As head of production at the Bad Pyrmont location, I am not only pleased about this innovation from our own company, but also about its application in our own production facilities.

Speaking of manufacturing, compressed air is indispensable for us. But at the same time, it is the most expensive form of energy. We report on approaches that we are taking to significantly improve our balance sheet at all locations starting on page 32.

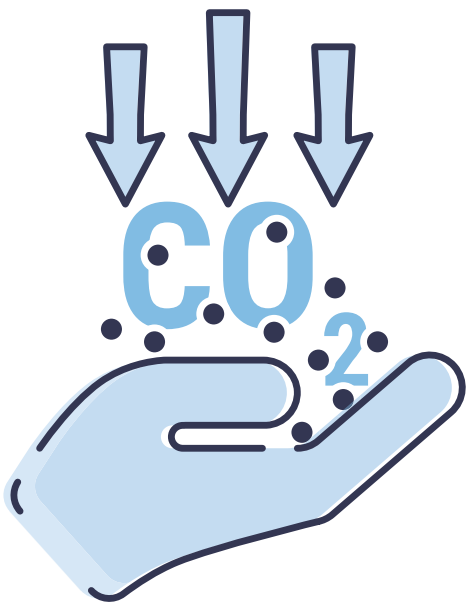
I will not reveal anything about the "hanging gardens of Vaihingen" here, but I will say that starting on page 36, you can read about what happens when two innovative partners work together on a project.



The fourth element, “air”, is represented through the art of minimalism – a cover design with the courage to have spaces and gaps

Visiting a technology leader – at a waste incineration plant in Hinwil, Switzerland

8



The CO_2 vacuum cleaner

Carbon dioxide is a climatic evildoer. In Switzerland, technology is being developed that can be used to suck this gaseous evil out of the atmosphere | **08**

Air is no object – if contact also works without contact

26

Interview with COO Torsten Janwlecke

44

Gardeners need a turntable ladder here. The vertical green façade is not the only highlight of OWP12

36

Why would you spring into the air? Because it is fun and safe

20

HIGH ALTITUDE

Ferris wheel and cotton candy

Modern safety technology ensures carefree fun at the fair | **20**

AIR GAP

Science fiction from Bad Pyrmont

The NearFi coupler transmits data and energy contact-free and over several centimeters. We visit its developers | **26**

COMPRESSED AIR

The compressed air detectives

Compressed air is considered the most expensive energy source in workshop and industrial production. It is worth looking into the details | **32**

CITY AIR

The hanging gardens of Vaihingen

A showpiece of the construction industry has opened in Stuttgart. What does the OWP12 building change for planners, architects, and operators? | **36**

INTERVIEW

Power through change

Torsten Janwlecke has lived through quite a few technologies – from digital photography, through hi-fi, all the way to connectors. He reveals where he sees its future starting on page | **44**

E-mobility

When the farmer charges twice

What will actually happen to the power grids if the desired electrification of mobility is also crowned with success in rural areas and new customers become major customers? A field trial by Stuttgart-based grid operator Netze BW highlights where challenges await.

The test site was “E-Mobility Alley” in Kusterdingen near Tübingen; its true postal address is Römerstraße and it is the home of 60 residential units. At the start of the trial in early 2020, eight residents were driving around the area on electricity, while the rest stuck with fossil fuel.

The distances between individual consumers are greater in rural areas, which means that grid fluctuations are more noticeable here. Therefore, additional sensors were installed. String regulators were to control the nearby transformers so that fluctuations could be compensated. And an additional buffer battery including charging management helped to cope with overloads and to derate charging activities where necessary.

Nevertheless, according to Netze BW, the power grid reached its load limits at times. This makes it clear that without the digital extension of power grids, widespread use of e-vehicles will be nearly impossible. In addition, they also found that the installation of private photovoltaic systems is a prerequisite to avoid gaps in the supply, especially in rural areas.

netze-bw.de

Geothermal energy

Mini drill with a bite

Geothermal drilling is a real gamble. If, after weeks of effort, the drill head ends up in the wrong place in the rock, there will be no water heated by geothermic energy pressing into the borehole. Instead, such failures tear big holes in the budget.

The Fraunhofer Research Institution for Energy Infrastructures and Geothermal Systems has developed a solution for this. “Micro Turbine Drilling” is used to machine the surrounding area at the end of the main bore. A micro-drilling turbine rotates at a furious 80,000 revolutions per minute, creating scores of additional small boreholes. These increase the catchment area of the main bore, and thus the chance of extracting heat from the water-bearing rock.

The horizontal catchment area of the deep bore is extended by a good 50 meters. This significantly reduces the prospecting risks, according to the Fraunhofer experts. The drilling turbine has bits made of tungsten carbide with embedded diamond grains. The tiny drill head is just ten centimeters long and 3.6 centimeters wide, and is driven by water pressurized to around 100 bar.

https://www.ieg.fraunhofer.de/en.html

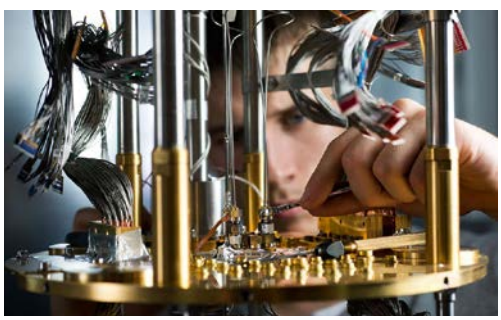
Supercomputer

A quick nugget from Jülich

Quantum computers do not calculate with bits and bytes, but with atoms and ions, referred to as qubits. They are used where even supercomputers run out of breath – for example in traffic control, quantum chemistry, and automotive applications.

The D-Wave company specializes in these quantum systems, and has now presented the latest offspring of quantum computing at the Jülich Research Center. The “quantum annealer” can operate with more than 5,000 qubits. It will be closely linked to the Jülich Supercomputing Center and, thanks to so-called “quantum entanglement”, will even be able to operate at “faster than light” speeds.

dwavesys.com



D-Wave specializes in qubit technology

Innovative battery storage

Organic and fluid

We are not talking about flower fertilizer, but about a revolutionary new battery storage technology from Alzenau in Lower Franconia. Since its founding in 2014, CMBlu Energy has focused on developing organic flow technology that works.

This is a completely different approach to batteries: Instead of solid metallic electrodes, CMBlu uses organic fluid electrolytes that are initially stored in external tanks and are only pumped continuously through the so-called battery stacks during the charging and discharging process. Here, the electrical energy is then released or stored again.

A battery storage technology that relies on non-toxic and non-combustible materials, that is available in almost unlimited supply, and the use of which is now technologically scalable on an industrial scale could be a critical pacemaker for storing renewable energies. And thus it becomes a key technology for the energy transition.

cmblu.com

Storing energy safely and cleanly

Hunting for hydrogen

Green Deal with Australia

The Covestro Group is a Germany-based company specializing in high-tech polymer materials. These are needed in a number of industries, including automotive, construction, and electronics. Covestro requires hydrogen to produce these polymers. Until now, this has been produced as “gray hydrogen” using large amounts of fossil energy.

Green hydrogen is to be imported from Australia in the future. To this end, Covestro has signed a deal with Fortescue Future Industries (FFI): FFI is to supply up to 100,000 metric tons of the coveted raw material and its derivatives across the globe in the future. Despite the long-distance transport, it can nevertheless be called “green hydrogen” because it is generated via renewable energy.

covestro.com

Fluctuating wind power

Low-wind catcher

Do you need a race car when you drive to the bakery? If you shake your head no here, then you can follow the argumentation of Münster-based windwise, who believe that wind turbines for strong winds are not the best choice when it comes to capturing the energy of a light breeze.

This is precisely the idea of the Westphalian engineering firm that recently presented its idea: lightweight, cost-effective wind turbine generators that are especially effective in low winds. While these systems, the prototype of which is currently being tested in Aachen, have to be derated or shut down in strong winds, they make much more effective use of the much more frequent low winds. This will be particularly interesting once electricity is no longer paid for based on the current feed-in tariff in accordance with the German Renewable Energy Sources Act, but according to actual demand.

Because they are lighter, they are much less complex in design, and their production and assembly costs are also much lower. And they are very practical in low-wind regions where their high-performance relatives would be far too expensive. Just like the race car and the bread ...

windwise.eu

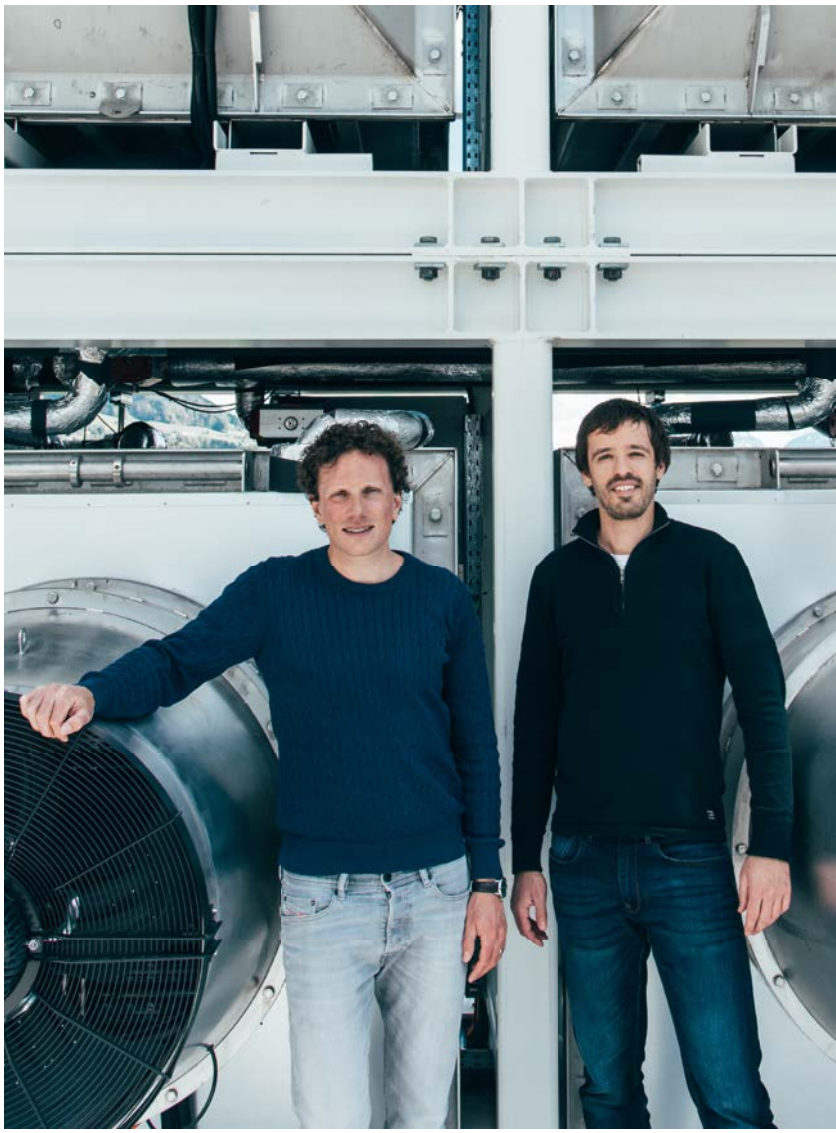
Photo: Andreas Buck

AIR FOR THE FUTURE

Near Zurich, in Hinwil, an impressive Climeworks system adorns the local waste incineration plant

The CO_2 catcher

Can the world still be saved? As before, carbon emissions continue to rise worldwide. What would happen if we did not just avoid climate-damaging carbon dioxide, but also reclaimed it from the atmosphere? A crazy idea? A Swiss company illustrates how this works.



Rendezvous with a garbage incinerator. Or a garbage recycler, as the Swiss call it. It is cold; a gusty wind whistles through pipelines, around chimneys, and through the lattice tube steps that have brought us to the roof of the imposing industrial plant. We are in Hinwil, in the Zurich Oberland. In the distance, you can just about make out the Swiss mountain panorama, because even in the land of the Confederation, autumn is well underway. Garbage is being burned under our feet, but on the roof of the waste recycling plant, the air is fresh and clear.

We live and breathe "waste"

Which brings us to the gaseous object of our desire. Air. Not only do we dump millions of tons of garbage onto and in the earth. It is not just the oceans that have to absorb the legacies of our civilizations. Since the beginning of the industrial revolution, we have also been using the gaseous body of our planet to absorb the volatile remains of our hunger for raw materials. Each year, we pollute the atmosphere with more than 34 billion metric tons of carbon dioxide, and the trend continues unabated.

Our Earth's atmosphere has formed over millions of years. Thanks to the evolutionary invention of photosynthesis, single-celled organisms and, on a large scale, green plants have drawn carbon dioxide out of the air and, in combination with the energy of sunlight, converted it into more complex carbon compounds and thus into biomass. The waste product of this process was and remains oxygen. If the plants decompose again then, in theory, exactly the same amount of carbon dioxide that they previously bonded will be released again. Fortunately for us, however, not all plants rot. Often, humus is formed. When it is layered, it gradually becomes more impermeable to oxygen. This slows down decomposition, and the carbon dioxide remains bound, stored in biomass. And is thus removed from the atmosphere. The excess oxygen that this produces is quite handy for our own respiration, among other things.

The principle worked brilliantly until man came along with the idea of using the stored biomass as an energy source on a large scale. Peat, coal, crude oil, and natural gas are all remnants of the plant surplus that has been accumulating for millions of years. By using these substances, we release the bound carbon dioxide again. The consequences have long been known: Greenhouse gas effects and climate change that will have catastrophic consequences, at least for everything that breathes oxygen on this planet. →

Jan Wurzbacher and Christoph Gebald are founders and CEOs of Climeworks

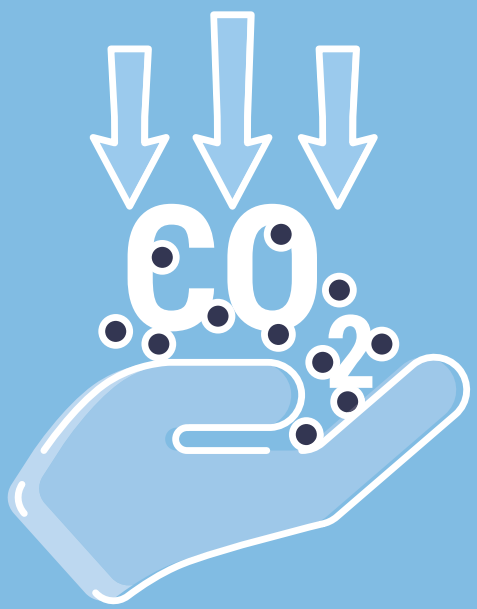
Approaches

Saving

The obvious thing to do now would be to drastically reduce carbon emissions. After all, these emissions threaten all of our existence in their current form, but carbon emissions will increase worldwide in the coming years to well over 40 billion metric tons.

The problem is the human psyche. It is true that we are well-prepared to cope with sudden crises, manage disasters, and survive accidents. But climate change is currently proceeding stealthily. The impacts are barely affecting those global regions that are particularly responsible for the majority of emissions. Thus, decision-makers often prefer short-term profit to the long-term survival of future generations and distant regions.

Although the economy is now beginning to reboot in many segments, the speed at which this is happening will hardly be sufficient to still be able to avoid crucial tipping points at which climate events change drastically.



Removal

But what would happen if we did not just focus on fossil fuel conservation? What would happen if we actively "retrieved" the CO_2 back from the atmosphere? And used it to be able to operate climate-neutrally? Or store it in a way that it would be removed from the material cycle? Christoph Gebald and Jan Wurzbacher had exactly this idea. The two German-born mechanical engineers met at the beginning of their studies at ETH Zurich in 2003. We are taking a look at the result of this meeting and the subsequent joint work in Hinwil.

> “It is similar to a sponge that absorbs CO_2 molecules. The air that leaves the plant has a significantly lower CO_2 content than before.”
>
> Sharidan Mohd Ali, Climeworks

The approach of the two mechanical engineers is enough to delight any technology enthusiast. This is because they are relying on innovation to remove man-made CO_2 excesses from the atmosphere. During our visit to the roof of the waste recycling plant, we are accompanied by members of the PR team of Climeworks, the former start-up founded by Gebald and Wurzbacher in 2009 as an ETH spin-off. Since then, the exciting start-up has long since become an exciting company with international flair. “The interest in our plant is enormous; we are now here at least twice a week and take visitors straight up to the roof.” This means that this waste incinerator is probably the most visited plant of its kind in the entire world.

Climeworks colleagues point to one of the house-sized structures that has found its place on the roof. Modular in design, the individual elements consist of large fans that draw in air and push it through a filter system. “The technology is called Direct Air Capture. We draw in air, send it through a filter material, and thus remove carbon dioxide from it. This is similar to a sponge that absorbs CO_2 molecules. The air that leaves the plant has a significantly lower CO_2 content than before.”

When the filter material is saturated, the respective suction port closes automatically. At temperatures up to 100 degrees and under vacuum, the carbon dioxide is then separated from the filter material and the filter is ready for use again. The carbon dioxide is captured, cooled, and compressed. How the separation works and the exact composition of the filter material is hidden from the view of curious competitors and media representatives, because it takes place inside the large containers that are part of the Climeworks system. Therefore, we are also denied a look at the inner workings, including its control elements. Around 1,500 tons of CO_2 are extracted here in Hinwil every year. →

1,500 CO_2

Tons of CO_2
are extracted from the air
in Hinwil every year.

4,000 CO_2

Tons of CO_2
is filtered out of the air by the
new Orca plant in Iceland.

The air that leaves the Climeworks plant has a significantly lower CO_2 content

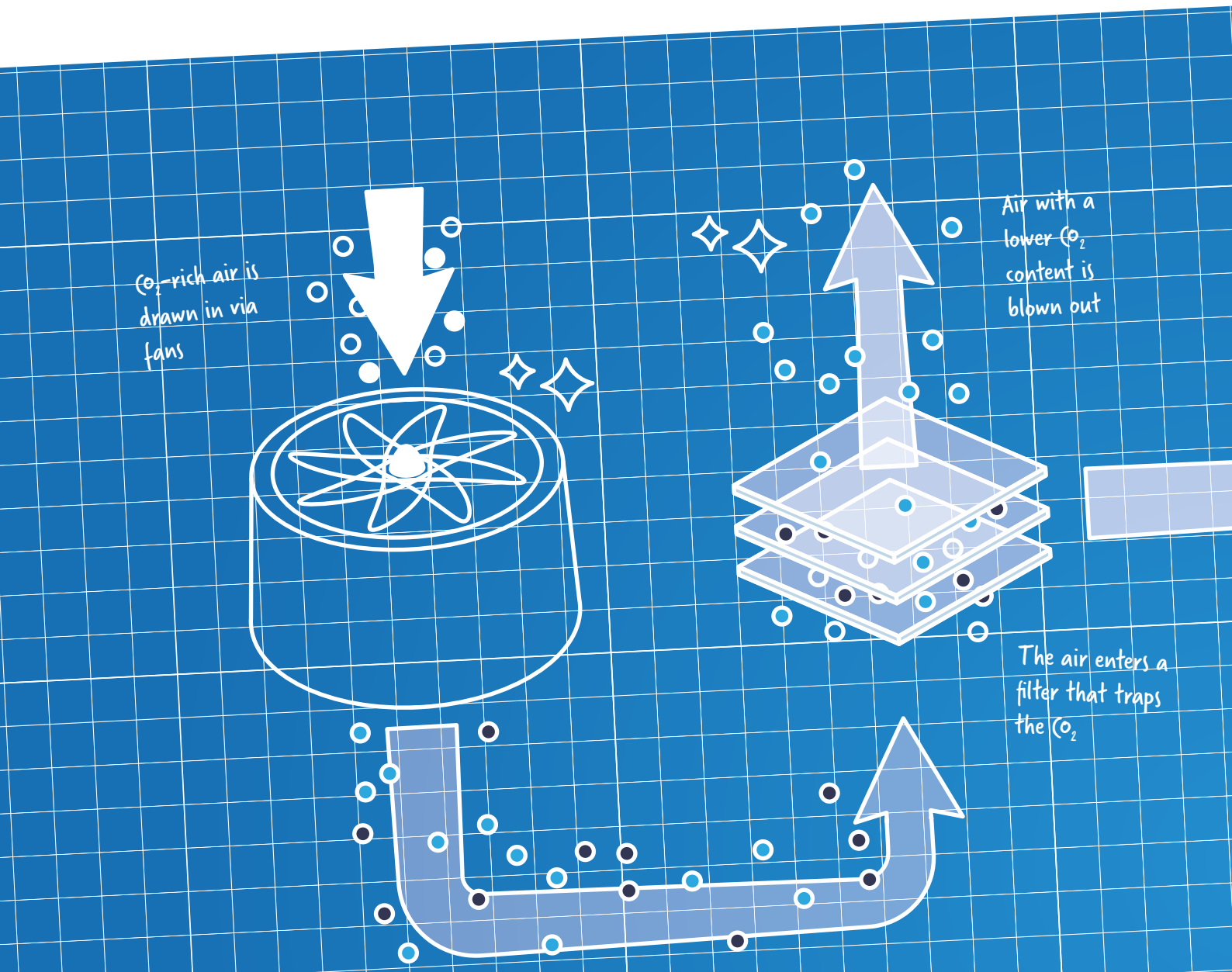
Industrial colossus with high-tech hood: filter system on the roof of the garbage incinerator

The suction units resemble oversized air conditioners

Location advantage – heat

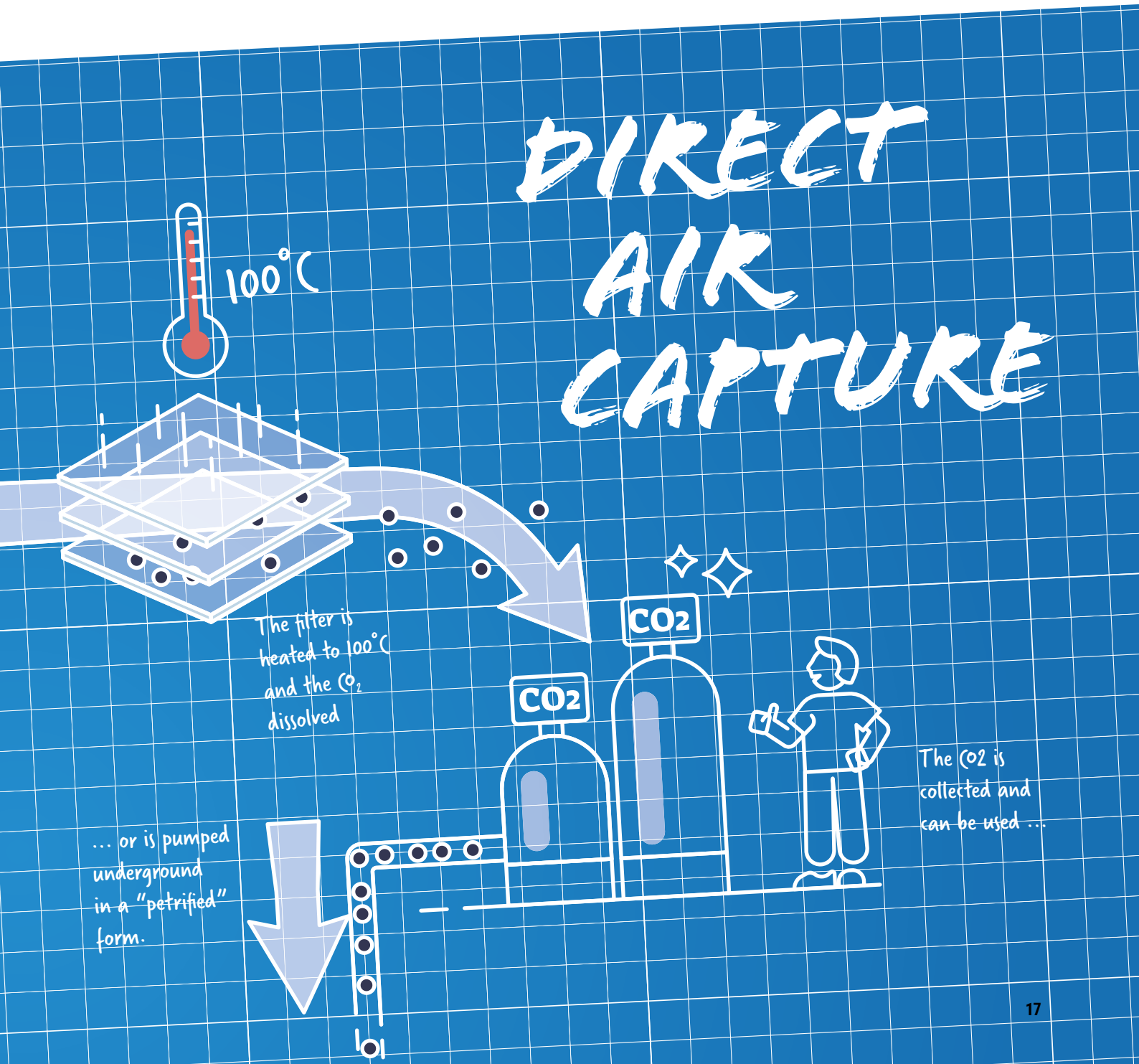
"We did not locate the system here in order to clean up the exhaust air generated through garbage incineration," we are told when asked. "Rather, we need the thermal energy that is generated here to extract the CO_2 from the filter." Climeworks has thus skillfully eliminated a weak point of direct air capture technology: The high energy necessary for separating the CO_2 from the filter material is normally a real and very expensive drawback. The capture of carbon dioxide alone accounts for around 80 percent of the total energy requirement.

There are several companies around the world that have built similar systems. But the Hinwil system is the only one so far to produce CO_2 from the atmosphere commercially and – here comes the second part of climate optimization – also make it usable. "Here in Hinwil, we use the extracted CO_2 in two ways." First, a local vegetable grower uses the gas as fertilizer for his plants. There is a greenhouse



complex in sight: "The CO_2 surplus improves the growth of tomatoes, cucumbers, and eggplants, because for plants, carbon dioxide is a basis of their photosynthesis and acts like a fertilizer."

A local beverage producer also uses the CO_2 to produce its carbonated mineral water. The water refiners collect the extracted gas and use it in their production facilities. It is also conceivable to fill completely different tanks, because carbon dioxide is a basic component of synthetic fuels. If the energy for refining is obtained from renewable sources, such fuels would even come close to being carbon-neutral. It is therefore no great surprise that Audi has been a Climeworks partner since 2013. →



The Icelandic version of the CO_2 vacuum cleaner is over four times more powerful than its Swiss predecessor

CO_2 sink in Iceland

While in Hinwil, Switzerland, the captured CO_2 is reused and thus released back into the air, a Climeworks plant has been started up in Iceland that aims to permanently rob the atmospheric pollution of its gaseous form and put it underground. "Orca" is the name of the latest and most spectacular plant built by the Swiss filter pioneers.

Here, the filtered CO_2 is bound in water and then injected down to a depth of up to 600 meters underground. It accumulates in the mineral-rich rock layers there – almost petrifying. "With the Orca plant, we can demonstrate that we can scale our technology as necessary," the Climeworks experts explain. "In Iceland, we can save more than four times the amount of CO_2 than we can here in Hinwil." But why Iceland, of all places? "The conditions are ideal here. We can draw the energy necessary for our technology completely renewably from a nearby geothermal power plant. And it is also easier to inject the carbon dioxide into the ground here, because the underground situation is well known. And, after all, the global atmosphere does not care at all where you extract the gaseous carbon dioxide from."

The partner in the planned burial of carbon dioxide is the Icelandic company Carbfix, which has developed the technology for the final storage of the CO_2. Although it is true that the quantities removed from the atmosphere are still tiny in comparison to annual global emissions, as Direct Air Capture is rolled out further, the contribution that this technology can make will become increasingly decisive.

The plans of the 150-employee company are very ambitious. "Our vision is to inspire one billion people to remove CO_2 from the air," says co-founder Christoph Gebald in an interview. Climeworks has

now built 15 plants worldwide, and the trend is rising rapidly.

However, if we want to reduce the excess CO_2 emitted (about ten gigatons) exclusively by using plants such as the one in Hinwil, it would take about eleven million of the Swiss CO_2 catchers. So there is still no way around reducing carbon dioxide emissions globally. (lo) ■

climeworks.com

The carbon dioxide is stored in porous rock, thus fossilizing

Lightheadedness and cotton candy

Ferris wheels have been the attraction of every fair for centuries. The wheel with gondolas rises high above every fairground and most buildings. But behind the colorful façade, state-of-the-art technology ensures the necessary safety for an entertaining excursion to lofty heights.

Generally speaking, a distinction is made between stationary and mobile Ferris wheels. According to Wikipedia, the oldest idea of a Ferris wheel comes from Bulgaria, where as early as 1620 some children mounted seats on a wooden wheel that they had set up. The structure, of course, was powered by hand. And they continue to please visitors and admirers in remote regions of the world with an almost unchanged design. The first modern Ferris wheel was then inaugurated at the 1893 World's Fair in Chicago. The structure, named the Ferris wheel after its inventor, reached to the remarkable height of 80.5 meters. And it was a complete success.

Muscle power and e-motors

The fascination for the Ferris wheel was awakened. As stationary installations, they still frequently characterize the image of cities today, for example in London and in Vienna at the "Prater", where the oldest of all active Ferris wheels is located. They are also the source of fascination in the form of mobile installations at fairs around the world. In developing countries, Ferris wheels are often operated by muscle power due to the lack of a power supply. But they are usually powered by electric motors, which are located to the right and left of the entrance area. Friction wheels are used to transmit power to the wheel.

The fascination for the visitor lies not only in the unusual perspective from a lofty height. It is always coupled with a slight sense of trepidation as to whether the machine actually works safely without the wheel coming to a standstill or any of the gondolas crashing. Things that are completely impossible? Accidents involving Ferris wheels are by no means just a trope from Hollywood action flicks. In 2016, two gondolas became entangled with one another in Nashville, Tennessee; three girls fell from on high, but survived. In 2013, a gondola crashed from a height of 30 meters in Argentina, killing two sisters. In 2019 in Erlangen, Germany, a man fell 25 meters and died. And in November 2021, a Ferris wheel came to a halt in Cottbus, Germany. Two passengers had to be rescued from a height of 30 meters with the aid of turntable ladders.

Kokkie Kroon is the heart and soul of the Dutch family business

From showmen to producers

Even though Ferris wheels actually embody a quite comfortable form of movement, the safety of the system is always worth taking a closer look at. The Lamberink-Kroon family knows their lofty rides very well. The Dutch company was founded by a family of showmen who had been operating mobile Ferris wheels for decades up until 2014, when they began to design and build the rides themselves.

Kokkie Kroon and Jan Lamberink are the managers of Lamberink Ferris Wheel. It all started when Kokkie Kroon's father bought a Ferris wheel in 1976. At first, the family of showmen traveled with it from fair to fair. And anyone who travels with such colossi also has to deal intensively with its construction during assembly and dismantling. Jan Lamberink therefore quickly became interested in building the attractions himself. Since the 1980s, he has consequently been involved in their construction. And it was in the very company that had manufactured the first Ferris wheel for the family. When this company withdrew from the market, the entire family decided in 2014 to build Ferris wheels on their own. As experienced showmen, Lamberink and Kroon naturally knew and still know exactly what their customers want. In the meantime, their Ferris wheels have become a household name among showmen internationally. The family has built more than 20 Ferris wheels since 2014 and sold them all over the world. And naturally, they also service them; sometimes on location, sometimes on the company's own premises.

Ferris wheel – a giant effort

Easy transportation, quick assembly and dismantling, low manpower requirements for assembly – all important requirements for the Ferris wheels. But what does it actually mean when a Ferris wheel is transported "easily" and erected "quickly"? The 33-meter "RL33" Ferris wheel requires four trucks for its transport and ten hours each time it is assembled and dismantled. 24 gondolas each hold six people, allowing up to 1,150 passengers per hour to enjoy the view.

The "RL46" can carry up to 1,800 people per hour to a lofty height of 46 meters. Twelve trucks and two full days each

Simple and unambiguous operation is a real safety feature in everyday life

Two Ferris wheels are set up at the same time on the premises in Overschild for service work

Kokkie Kroon (3rd from left) and Jan Lamberink (4th from left) with employees of JB Besturingstechniek and Phoenix Contact

for assembly and dismantling are needed to get the mobile monster up and running. Amazing figures that make it clear that operating a Ferris wheel is anything but trivial. Intelligent automation technology ensures that when passengers board the gondolas, the load on the wheel is even and the ride time is fair for the passengers. After all, every passenger wants to spend the same number of laps on the Ferris wheel for their money as all the other guests. And also to disembark the airy funmobile in one piece.

The steel construction of the mobile Ferris wheels is carried out by third parties on behalf of the internationally active company. For control cabinet manufacturing, Lamberink and Kroon rely on the expertise of the specialists from JB Besturingstechniek in Oosterwolde, the Netherlands. Assembly and subsequent commissioning take place at the company's premises in Overschild. Rides that have already been delivered are also set up here for maintenance and overhauled. In addition to sales, showmen can also rent the Dutch-manufactured Ferris wheels.

What they all have in common is that everything that has to be plugged in electrically is designed extremely robustly with connectors made in East Westphalia. And if you think of a Ferris wheel at night, you can guess how many electrical connections are needed to make it an illuminating fairground beacon.

Safety through automation

For the safety of the passengers, it is important that the Ferris wheel does not start moving until all passengers are safely seated in the locked gondolas. The operator can monitor passengers boarding the Ferris wheel via a web-based visualization system. The control tasks are performed by an Axioline controller from Phoenix Contact. →

The standard controller is not permitted to start the Ferris wheel or execute the emergency stop for safety reasons. Lamberink decided to use SafetyBridge Technology from Phoenix Contact. Safe input and output modules acquire and issue the signals. They also constantly perform diagnostics and monitor the module for short circuits, for example.

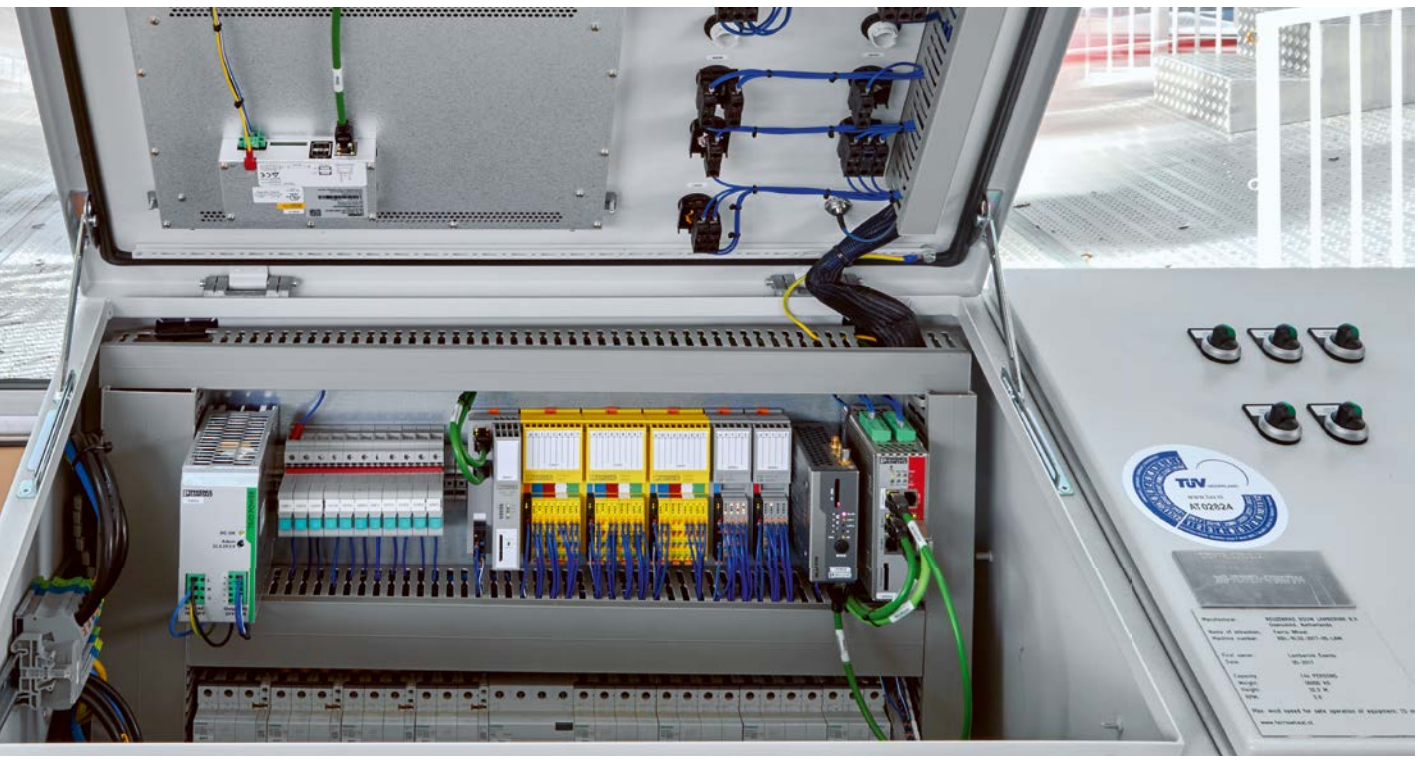
A logic module in the SafetyBridge installation generates and controls the safety-related transmission protocol. It detects errors in the communication of the individual modules. If, for example, a transmission error occurs in an input module, the system switches to a safe state and the Ferris wheel stops. The operator is then automatically given instructions on how to rectify the fault. And if the operator does not find the fault immediately, then there is a cellular modem integrated into the automation solution via the secured access. This means that the operator on location can be supported remotely in the event of a fault. This is a key factor, because the operator is not always familiar with every technical detail of the lofty delight.

Safeguarded in this way, rescue climbers and turntable ladders to assist in dizzying actions should no longer needed in the future – after all, the cotton candy will always be waiting for the visitors on the ground. (st/lo) ■

https://www.reuzenrad.nl/en/

Boarding can be monitored with the visualization system

Power supply, controller, and remote maintenance module in the control box



65

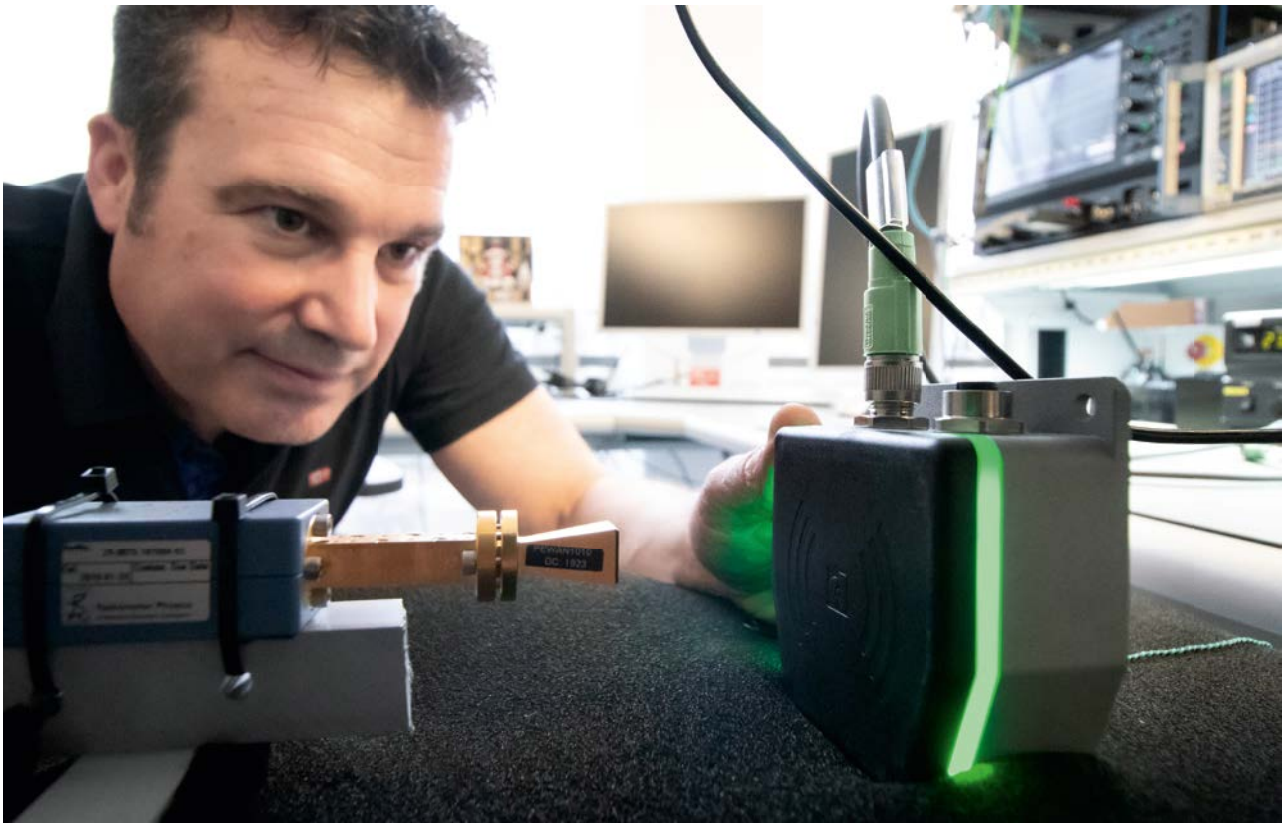
meters – the height of the "Prater" Ferris wheel in Austria, the oldest working Ferris wheel

250

meters – the height of the "Ain Dubai", the largest Ferris wheel in the world (opened in 2021)

The contactless connector

Is the precursor to teleportation already here? When data and power move through the air and set systems in motion, there is a whiff of science fiction in the air. Two developers provide an insight into a future-oriented development.



Maik Stemme and "his" NearFi coupler

Actually, Maik Stemme and Norbert Schulz look quite normal. Two fit gentlemen in their prime, casually dressed, and completely relaxed in the midst of cables, measuring instruments, and monitors. But the two are part of a team that is working on the future. And such people usually wear futuristic lab clothes in the middle of hermetically sealed laboratories… but we are in Bad Pyrmont, not Hollywood.

The NearFi coupler nevertheless is causing plenty of furor. It is not without reason that it recently won the Automation Award from the trade journal elektroAutomation. The contactless connector transmits both data and power without the direct contact of copper or plastic. However, the air gap should be no greater than a few centimeters; that is to say, it should be in the "near field".

This contactless transmission comes into its own wherever connections have to be frequently released and re-established. Application examples include tool changers in robotic systems, where errors in conventionally inserted tools can lead to a standstill and thus directly to a loss of production. In harsh industrial environments, conventional connectors with their sensitive terminal pins are at risk of wear and contamination, which can impair functionality.

In one specific application, the task is to control a valve terminal behind which pneumatic, i.e., compressed air-driven, tools are waiting to be used. The tool itself is equipped with electronics, which are supplied with 24 volts. It receives the necessary commands via the control system.

Power

The transmission of power without direct plug contact is already familiar in everyday life, for example in cell phones and electric toothbrushes. The devices are charged inductively using magnetic →

“We do not charge inductively, we switch inductively.”

Maik Stemme,
Development Engineer Phoenix Contact Bad Pyrmont

4

Distance of centimeters easily overcome with both data and power

fields. "The principle is similar here, but then again still quite different," explains Maik Stemme. The development engineer explains the differences. "In the situations described in everyday life, the housings rest against each other. And the energy flows slowly and continuously. This is quite different with the NearFi coupler. We can bridge a distance of several centimeters with it. It is also necessary to be able to transfer peak loads in a machine control system. While our contactless coupler can transmit a constant 50 watts of continuous power at 24 volts, switching peaks during a switching operation are also no problem."

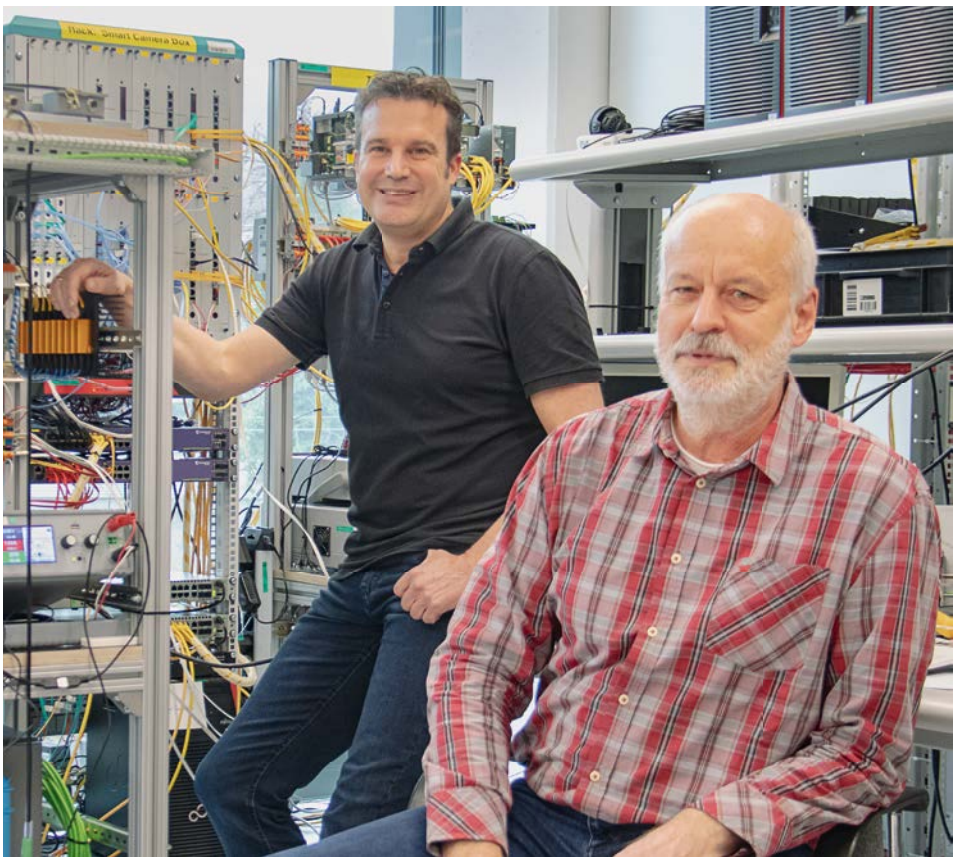
Communication

However, the right-angled coupler only really comes into its own with its ability to transmit data streams across the distance, in addition to power. At first glance, in the age of 5G and RFID, this is not necessarily spectacular. However, the NearFi coupler is making a technological breakthrough here, as well, as test engineer Norbert Schulz explains. "We can transmit Ethernet data in real time. The latency is two microseconds, which is about 500 times faster than the new 5G networks. And completely protocol-independent, because we do not assign our own wireless protocol to the data. It is not necessary to specially configure the devices to a protocol. And that is what makes our system so fast and easy to use.

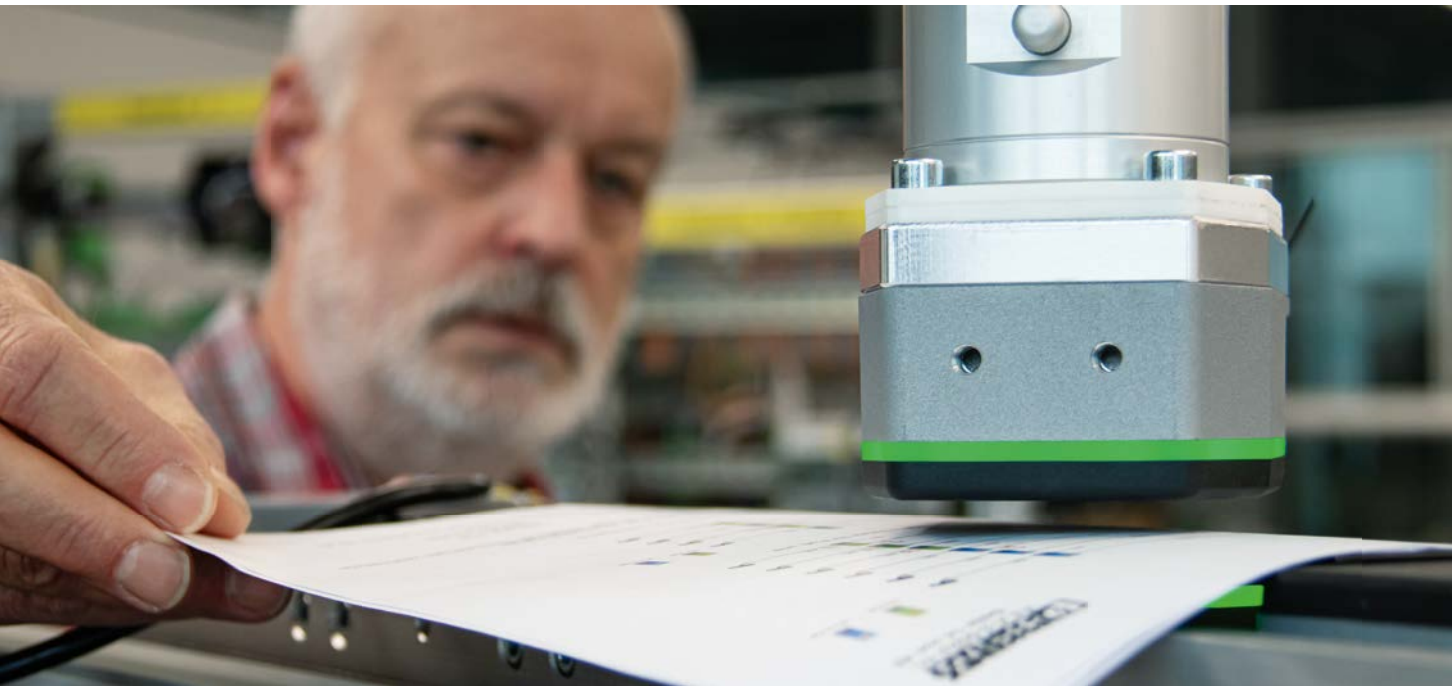
"Ethernet protocols such as PROFINET and EtherCAT® are thus available without restriction. And this also works when non-metallic materials such as glass or plastic are sandwiched between the transmission surfaces. The gap between the two contact surfaces can easily be up to four centimeters. These are essential conditions for carrying out precise switching and control operations, for example." The combination of power and data transmission is unique on the market.

Teamwork

The idea for the NearFi coupler had been on the minds of the engineers at Phoenix Contact for some time, as Maik Stemme explains. The 47-year-old development engineer has classical craftsmanship



The two experienced engineers are part of a development team



It works anyway – Norbert Schulz trying to mislead the coupler

“We are transmitting data in real time.”

Norbert Schulz,
Test Engineer Phoenix Contact Bad Pyrmont

Robot arms are experimented on in the test lab

roots in his training, having first studied to be a radio and television mechanic. At Phoenix Contact, he was already part of the development team for Radioline, so he is very familiar with the transfer of data via wireless. “The actual work on the NearFi coupler project then took about 18 months, from the proverbial clean sheet through to the finished product.” The positive response set in even more quickly, as the new development obviously closes a technological gap.

There are several versions of the NearFi coupler. In the future, the two engineers and their team will be working, among other things, to extend the range of applications for the couplers, for example to look at other solutions for data transmission. Even if the gap in the transmission of power and data only opens up by a few centimeters – it is a step into the future. (lo) ■

phoenixcontact.com

Dirk Bartling is on the trail of escaping compressed air with all his senses and a "Leak Reporter"

The compressed air detectives

It is loud in production halls. Very loud. And yet a hiss can be heard again and again between clattering machines. What laypeople perceive as one noise among many in the din of the plants can be a sign for experts: compressed air is escaping. We were on the trail of leaks with the compressed air detectives.

Underneath the plant site, there is an underground world with miles of supply lines

Dirk Bartling listens very carefully. Because he can hear the escape of energy. The systems electronics engineer is an energy coordinator in the Business Unit Device Connectors at Phoenix Contact. With almost detective-like legwork, he sets out to find leaks in the production area. Natia Bedianashvili is also on the trail of compressed air there. Because the search is worthwhile: Compressed air is one of the most expensive forms of energy in any production plant. Yet still indispensable, because it is used to clean with powerful jets, it is used to control with short bursts, and it is used to drive with a gentle touch.

The compressed air has to be generated and stored in large compressors. This consumes a lot of energy. Therefore, as little of it as possible should →

escape back into the atmosphere unused. At the same time, compressed air – along with electricity – is indispensable in production. “Our machines would not run without it,” says Dirk Bartling, citing systems that turn out tens of thousands of PCB connectors every day as an example. Here, cylinders and feed units are controlled pneumatically and very precisely.

Down to the last corner

Air-controlled units are easier to install in the plants, explains Dirk Bartling. And they need maintenance less often. The expert lists further arguments in favor of the gas mixture surrounding us: Air is present everywhere and in unlimited quantities. Compressed can be stored without difficulties. It does not deposit pollutants such as oil or dust in the equipment, and it is not affected by temperature fluctuations. Nor can it burn or explode. And it can be transported over great distances.

By the time the cylinders and feed units in the systems at Phoenix Contact start moving, the compressed air has sometimes traveled a long way through the production halls: Out of the compressors, through ring and cross feeders, to connection blocks hanging above the machines. The ring

The transport pressure is around six to seven bars

The supply lines run in underground tunnels crosswise under the location

Modern and energy-efficient compressors turn plain old air into precious compressed air

feeders have an inner diameter of around 70 millimeters. Via distributors at around six bars, the compressed air finally reaches the machines leading to valve terminals and from there into countless hoses. The smallest of these have an inner diameter of just two millimeters. They lead the air to the actuators, where the compressed energy carrier then escapes with a hiss, releasing its power. No wonder that in Blomberg alone, a kilometer-long network of lines and hoses is installed.

The eavesdropping camera

"A lot of leaks can occur along these long routes," explains Dirk Bartling. We are in the terminal block production facility in Blomberg. He regularly heads off in search of the leaks here. He no longer has to rely solely on his detective instinct and his sense of hearing. He uses a "Leak Reporter", a tablet-sized industrial acoustic camera. "Similar to a thermal imaging camera that visualizes infrared radiation, the 'Leak Reporter' visualizes ultrasound. This has proven to be an effective method of locating compressed air leaks. It allows me to recognize the leak immediately from a distance," explains Dirk Bartling. In the best case, all he has to do is tighten a small screw to fix the leak. In the meantime, he also trains colleagues in carrying out such tests.

With the aid of the camera, it is easy to document and calculate how many liters of compressed air are lost per minute, what this means for an entire year, and how much the loss costs. "Becoming more efficient naturally contributes to our key goal: carbon neutrality," explains Dirk Bartling with a nod to the power supply. At the Blomberg location alone, Phoenix Contact's compressed air requirements reached almost 29 million cubic meters in 2020.

Stefan Gottschalk, Energy Manager at Phoenix Contact, estimates that the leakage rate in some areas is just 15 percent – a good value. Elsewhere, however, it is still around 30 percent, which is comparatively high.

Depressurized during downtimes

However, leak detection using an acoustic camera is just one of many elements on the road to carbon neutrality. Natia Bedianashvili has proven that there are still more to be found, especially when it comes to compressed air. She controls production in her area – from materials through to personnel. The 33-year-old has trained as a PEX expert. The goal of these specialists at Phoenix Contact is to make work processes more effective and avoid waste at all levels.

Natia Bedianashvili has initiated a project to reduce compressed air waste. Years ago, she says, she noticed that the machines were emitting compressed air even during downtimes. "There is always a hissing noise," she learned from the production line. Her measurements confirmed these observations. All of the machines lost dozens of liters of compressed air during production breaks.

"I noticed that even idle machinery hisses."

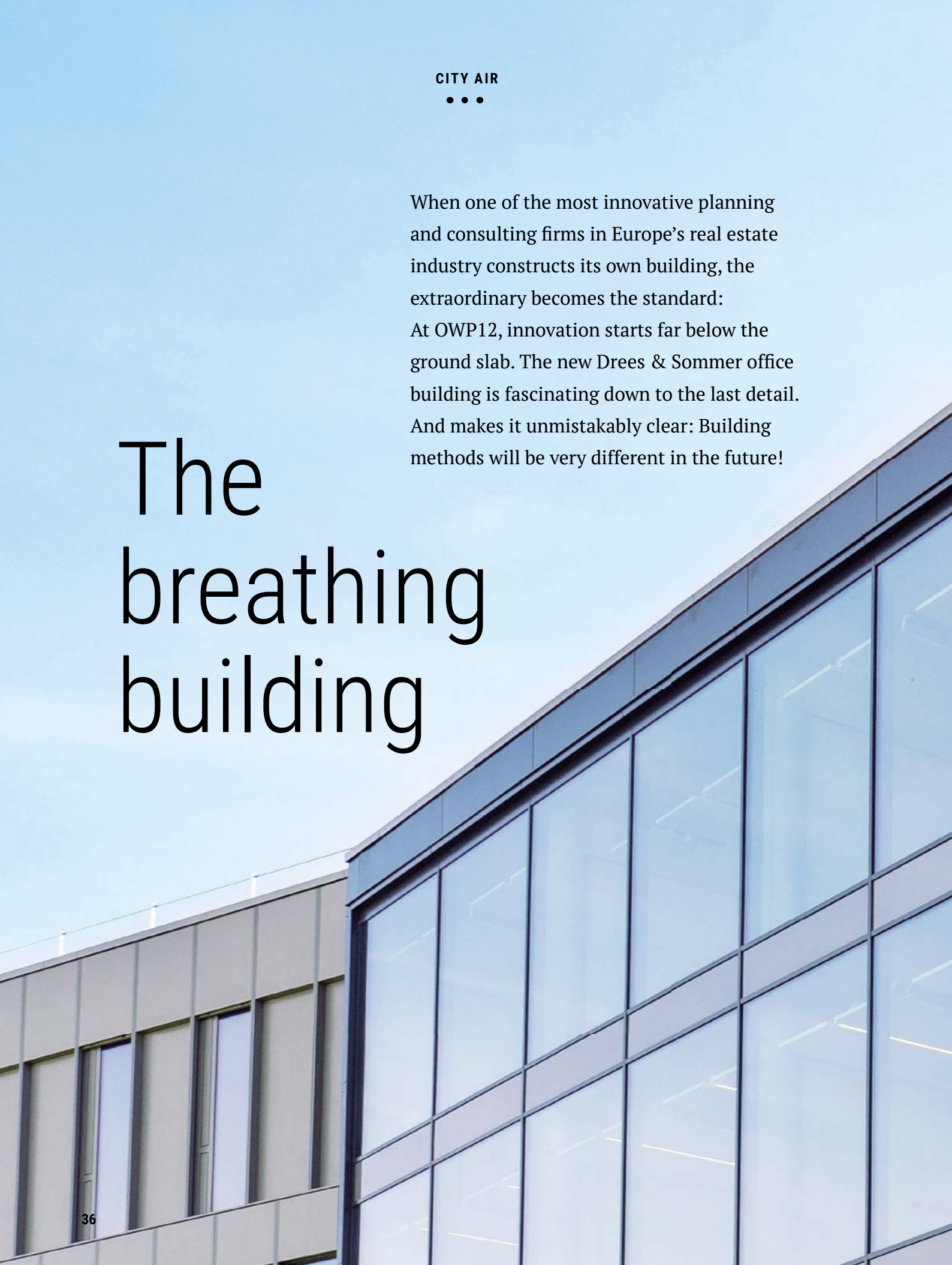
Natia Bedianashvili,
PEX Expert Phoenix Contact

The solution is as obvious as it is simple to implement. "If a machine is at a standstill for several minutes, the compressed air switches off automatically," explains Natia Bedianashvili, thinking back to not so long ago when some employees still switched off the expensive compressed air by hand. "The automatic shutdown system is gradually being programmed into all machines," says the PEX specialist. Together with her project team, she calculated that this alone could save several thousand kilowatt hours of electricity per year.

The proverbial thriftiness that is attributed to the East Westphalians therefore doesn't just make their own financial controller happy. The compressed air detectives help to conserve energy resources and thus also give the environment a small breath of fresh air. (cj) ■

When one of the most innovative planning and consulting firms in Europe's real estate industry constructs its own building, the extraordinary becomes the standard: At OWP12, innovation starts far below the ground slab. The new Drees & Sommer office building is fascinating down to the last detail. And makes it unmistakably clear: Building methods will be very different in the future!

The breathing building



>100

square meters – the size
of the seeded north façade

>12

meters – the height that the
vertical meadow, occupied by
eleven different plants, reaches

The vertical flower meadow is irrigated from rainwater cisterns on the roof

Bergenia 'Oeschberg'

originates from East Asia and has purple-red foliage in winter

Goat's beard

long-living, hardy plant that likes partial shade

4–5

degrees Celsius is the temperature difference that the green curtain brings to the building

Alum root

can cope with dry periods, loves partial shade, is frost-hardy

The most-photographed portion of OWP12 is in the central part of the façade. A vertical flower meadow is still exotic, although many planners and decision-makers want this to change significantly in the coming years. OWP is the abbreviation for "Obere Waldplätze", and describes a street in the Stuttgart neighborhood of Vaihingen.

But before we are able to admire the fall-colored natural façade up close, we have to find a parking space. More than 4,000 employees work for the international consulting firm for the construction and real estate sector, 1,100 of them on site at the company's headquarters alone. The way to the first meeting leads us past the construction site.

Practice what you preach

Steffen Szeidl is one of three members of the Drees & Sommer Executive Board and explains why we are facing a game changer in the construction industry. "We have grown strongly in recent years. Three years ago, therefore, the decision was made to construct another building on the Drees & Sommer campus. Even before COVID-19, we had equipped our existing office landscapes with state-of-the-art media technology and created the conditions for hybrid working between working from home and the office. The new building now offers everything that the home office cannot or cannot always provide: Rooms for concentration, communication, and cooperation in the various teams. And with this new building, we of course want to set the best example for our customers as well, creating a sustainable and digital blueprint for the office buildings of the future. Practice what you preach."

With an amused sigh, the company boss explains, "As a consulting firm specializing in construction and real estate, the demands on our own project are naturally especially high. They do not just come from our experts in civil and industrial engineering. They also come from the experts that we also employ from various disciplines such as chemistry, design, psychology, and ecology. And balancing the requirements of so many disciplines in our building was not always easy, so we are all the more proud of the result."

The path to the lighthouse

The new heart of Drees & Sommer starts as a PlusEnergy house; that is to say, it should generate more energy than it consumes. Thomas Berner, the OWP12 Project Manager, joins the conversation. He explains why the innovation starts under the very first layer of concrete. "We started with the

topic of sustainability. It quickly became clear that we wanted to use geothermal energy. 22 boreholes are located under the building and supply OWP12 with heat. In addition, there is an innovative photovoltaic façade on the south and west sides. The topic of energy generation continues up to the roof. However, it became clear that we would not be able to create enough seeded roof space. This is how the idea for our eye-catcher came about – the green façade immediately grabs your attention."

The experienced civil engineer describes what the hanging gardens of Vaihingen are all about. "We didn't want mosses and brown plants, but a flowering, invigorating ensemble throughout all seasons. On the north side, this is not so easy, especially on such a large area spread across several stories. But with a carefully designed planting plan, the wall grows and thrives excellently. The green curtain provides a temperature delta of around 4 to 5 degrees, warmer in winter, cooler in summer." Berner describes, not without pride, that the City of Stuttgart has stipulated green façades on commercial buildings in new development plans, but there has been little experience with them to date. "This is where we are true pioneers. Together with the companies involved, we have implemented new developments."

Thick is a waste

Walking around the building, we reach the south side. Just a little over 20 meters lie between the building and the noise, because the six-lane A831 runs past here. Thomas Berner points to the next innovation. "This is a true world first. The façade here is made up of modules. Suitable for high-rise buildings. Durable. With perfect sound insulation. And equipped with solar cells." These vacuum-insulated panels with superior properties were developed together with the companies FKN and Evonik. The experts have designed the elements so that the vacuum insulation loses its supposed sensitivity. "We expect a service life of at least 40 years." →

Innovation in detail – photovoltaic elements are integrated into the façade modules on the south side

"Everyone says buildings need to be greener. But there are not enough blueprints for sustainable building."

Thomas Berner,
Drees & Sommer

The green façade is positioned on the technically unfavorable north side, but thanks to carefully selected plants, it continues to grow

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The vacuum-insulated façade modules are only centimeters deep – record-breaking

Company boss Szeidl adds that the modules are cradle-to-cradle-capable, meaning they can be broken down into their constituent parts and the materials can be reused. A priceless high-tech gimmick? Steffen Szeidl energetically denies this. "The façade has a depth of just nine centimeters, and including photovoltaics just 21 centimeters, rather than 35 to 40 centimeters as for a standard façade. This creates several square meters more of usable space. And that makes these elements, which are about 20 percent more expensive, absolutely competitive in terms of cost."

And another thing: The sound insulation of the thin façade was tested by the Rosenheim Institute for Window Technology and certified as exemplary. Szeidl adds, "The modules were registered as a patent and submitted for testing. Building-authority approval as a façade suitable for high-rise buildings has been available since last year."

Building with curves and edges

Not only is the proximity to the freeway a challenge, so is the shape of the plot of land itself. Szeidl describes it as banana-like. The floor plan of OWP12 also follows this shape. This results in three building elements. The central part with the green façade represents the joint that connects the other two parts of the building and around which the building curves.

To keep the costs in line, the planners used a special trick, as Steffen Szeidl explains. "When it comes to construction, people always say that we only build one-offs. But this is nonsense. If you look at automotive engineering, for example, an extremely large number of versions are possible, but they are all assembled from a manageable number of possible components. So, in terms of planning, we divided the building into smaller units and looked at where we had the same functionalities. How can we modularize as early as during the planning stage? In this case, it was not about the cheap square box. To do this, we applied a digital planning methodology that can translate any individual architectural design and any technical building concepts into modules."

The company boss adds, "This is clearly a revolutionary idea, because if you look at the new buildings throughout Europe, we have about 80 percent one-offs, and just 20 percent are standardized. We need to turn that around if we want to build faster, more cost-effectively, and more efficiently. You can see in our building that standardized modules are reused on every floor. So we end up with a property that is innovative and unusual, but on par with standard solutions in terms of lifecycle costs."

Down to detail

We meander past workmen and material into the interior of OWP12 and work our way up to the fourth floor. "Up here, we are almost completely finished already," Thomas Berner describes the situation on site. The drywall is in place, the carpet is laid, and the interior finishings are almost complete. Except for the ceiling, because the installations up there are not yet covered. "No, we have finished that as well," states the expert, drawing astonished looks. "We set ourselves the goal of

“Following the example of the automotive industry, the construction industry can also standardize recurring processes and prefabricate parts of a building.”

Steffen Szeidl,
Vorstand Drees & Sommer

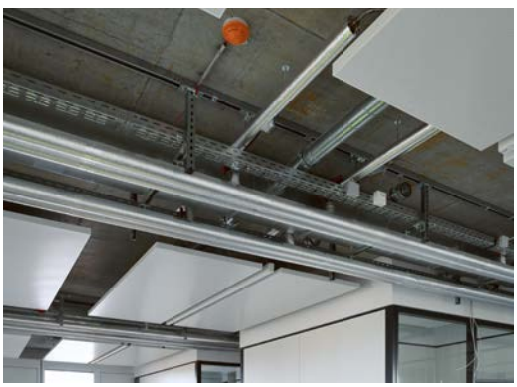
achieving a higher quality that is also clear to see afterwards. So no suspended ceilings. We also want to be able to show our visitors these solutions later on.”

The idea of the module takes on a whole new dimension in OWP12, especially in the interior design. Berner begins by describing the standard. “First, the planners draft the requirements, then it goes out to tender for each individual trade; usually, the cheapest is then awarded the contract. In the standard you have the shell, into which then comes heating, ventilation, cooling, sanitation – each with its own installation team, each with its own planning. So there is a fair amount of tinkering and reshuffling going on locally.”

But the Stuttgart-based company wanted to break up this rigid practice and implement a much more agile form of building design and construction. Together with the Swabian Würth Group, Drees & Sommer developed another revolutionary concept.

Thomas Berner describes the process. “We wanted to achieve as much prefabrication as possible. We have developed TBU modules with Würth. These are five-meter-long modules that contain elements of the technical building utilities – for example, heating, air conditioning, and electrical engineering. The modules can be manufactured in the hall regardless of the weather and also the location. Then they are delivered →

Thomas Berner explains the advantages of the energy-producing and sound-absorbing façade modules



The building technology will also remain visible in operation

The pre-assembled TBU modules are installed in no time at all

A 400-square-meter unit was fully installed in four hours

> “We should no longer think of individual trades separately in construction projects.”
>
> Thomas Berner,
> Site Manager OWP12

to the construction site by truck just in time and assembled here. And with just one team. This eases the burden on the installers and at the same time increases quality, since the individual modules can be produced with precision down to the millimeter. Furthermore, we are much faster, accomplishing in half a week what would otherwise take two weeks. On the third floor, for example, it took four hours to complete a 400-square-meter unit. Heating, ventilation, plumbing, refrigeration, and electrical lines, fully insulated and with all valves mounted so that the lines can be drawn separately.” You can clearly see the old hand’s enthusiasm.

Better late than never

So it is all sunshine when it comes to the new building? Steffen Szeidl admits, “Despite everything, we almost made a crucial mistake anyway. We did not bring Phoenix Contact on board until relatively late,” says the expert, describing the usual practice. “MCR, that is to say the building automation, is usually the last to be awarded the contract in the construction process and then has to put up with what the other trades have defined in their tender. As a result, building automation, which actually stands for the efficient integration of the trades, often remains a patchwork. It has to knit a coherent overall concept out of many of the services installed by other trades far too late, caught up in the most diverse interfaces, different functionalities, and with intense time and cost pressure.”

However, since Phoenix Contact and Drees & Sommer were in close exchange in other projects, the topic of OWP12 was bound to come up at some point. And as it turns out, just in time, as Szeidl emphasizes today. “I am very glad that Phoenix Contact joined us in the late planning phase.” The East Westphalians brought with them the subject of IoT-based building automation in their concept of smart building design, which was a crucial driving force in this phase.

Bernhard Tillmanns, Director Industry Management Building Technology responsible for the topic at Phoenix Contact, clarifies. “We recommended BIT as our system partner for the project. BIT comes from a data center construction background, with expertise in utility engineering. These experts also brought IT expertise, data modeling, and IT security to the construction phase, skills that are necessary when building an innovative building management system. It was very important to us to change the mindset here. Only when this expertise is incorporated early on can a building also develop entirely new capabilities later in its operation.”

Hardware is just the shell

Steffen Szeidl explains: "Planning, construction management, completion date, and operation – these are often separate mindsets and different tasks. With OWP12, on the other hand, we had everything from a single source. And we want to take advantage of this opportunity. We no longer just talk about hardware that I can touch. Is the door mounted correctly? Have the lines for fire protection been drawn?

Until now, the amount of software in a building was very manageable. In our projects 'The Ship' in Cologne, 'Hammerbrooklyn' in Hamburg, and the 'Cube' in Berlin, we therefore anchored a digitalization strategy together with our customers that enables new business models. If I rent out my offices by the hour, for example, and this is done via an app through which the customers book and also receive the invoice, then that has to work. And if the software does not run, along with all the technical functionalities behind it, then the whole business idea I have with the building may break down. So it is no longer just important that the hardware is installed. The focus is also on software that enables new business models."

In OWP12, a specially developed app is used to make all room and office space bookings, among other things. Drees & Sommer has been working without fixed workstations for several years. Along with this tool, the app also has an access control system. Even the cafeteria works with the app for recording and billing.

Thomas Berner explains that the development of a dedicated app is now as much a part of a modern office building as ventilation or heating. "It is no longer just about making sure the physical building is completed on time. Additional time must be scheduled so that the necessary software can also be tested in operation. This is changing the way we build, and we need a whole new way of thinking.

And if we only work on one software platform, i.e., if we avoid subsystems from all the individual trades, then we are in a much better position to deal with crisis situations, for example. As an operator, at any point necessary, I can determine later on where I need switches, for example, because the structures allow that. And this is precisely where Phoenix Contact's Emalytics functionality is decisive."

Steffen Szeidl agrees with him. "In the future, we will have to think about building automation much earlier, as early as in the planning stage, and much more fundamentally. This is the only path we can take, and we will also be repositioning this subject internally in future projects. The adaptability of Emalytics moving into the future is simply compelling. And with the Phoenix Contact system, we are completely flexible and can reallocate uses without having to lay completely new cable runs. We can change things via software programming without anyone even noticing, without any structural measures. This is what building in the future has to look like." (lo) ■

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Teamwork also works across trades at Drees & Sommer: Thomas Berner (Project Manager), Christof Göbel (IT/Digitalization), Ulrike Schweizer (Corporate Communications), Fabian Zeilinger (TBU Specialist Planning)


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Coming full circle

Japan, the USA, and the southern Black Forest – Torsten Janwlecke has become acquainted with very different cultures in the course of his career. But the COO of Phoenix Contact started his career in the trade "just around the corner". In this interview, he reveals how he came back to his old home, what the attraction of East Westphalia is for him, and where he sees the future of connectors.

➔ Mr. Janwlecke, when did you join Phoenix Contact and how did your career start?

I've been here since 2016. I was born in Bünde and grew up in Preußisch Oldendorf. In other words, a true East Westphalian. After a classic apprenticeship as an electrician, which involved pulling strands, chiseling cable ducts, and repairing machines, I attended the University of Applied Sciences in Bielefeld. There, I studied electrical engineering with a focus on communications engineering. I still benefit from the practical work in the trade today.

I then applied to work on my diploma thesis at a BMW subsidiary. I wanted to go to Munich, that was my dream destination. I was then also able to write my diploma thesis at Kontron Electronic in Eching and then start working there. My project was a special graphics card – a printed circuit board with a new graphics chip and suitable programming for it, which was needed to be able to display characteristic curves from the car on service monitors. However, after the project was finished, I was not assigned a new project. Instead, I was asked if I would like to sell this graphics card along with other computer components for use in standard computers. But for that I was supposed to go to Hamburg to the sales office there." He laughs. "To this day, I still do not know if that question arose because I was a bad developer or because they thought I was a better salesman.

➔ A tough decision, moving from the south to the far north.

I would have really preferred to stay in Munich. But then I lived in and around Hamburg for almost 20 years and learned to love the city. And the graphics card was successful. Numerous companies, including in the shipping industry, were undergoing a technological upheaval at the time. The design department there was equipped with CAD programs that were completely new at the time. And they needed the graphic display.

The opening of the border in the fall of 1989 was a far-reaching experience. I had the entire Baltic Sea region under my supervision. That was a gold rush era. Reaching revenue targets was in the palm of your hand. Therefore, I decided at the time to add a degree in business administration.

→

➔ Part time?
Yes, I learned commercial subjects at the University of Applied Sciences in Hamburg that the typical engineer does not have in their portfolio at all. When I finished, there was a job at Hitachi in Hamburg: selling computer peripheral products in German-speaking countries. Japanese electronics companies were very successful at the time, and there was also the attraction of the unfamiliar business culture. Hitachi is an original Japanese company, very Japanese in structure and management.

After a good two and a half years, I switched to Olympus. The Japanese have their European headquarters in Hamburg. Olympus was much more globally positioned, more oriented toward the depth of local value chains, and not as focused on Japan as its home market. This was at a time when Olympus was about to embrace digital photography, and there was no one there who knew anything about the accompanying graphical computer technologies. Gold-rush atmosphere again. Even if the beginning was troublesome, because at first nobody believed in the success of digital photography for laypeople. I have also been laughed at by the competition in press conferences. But after 1996, things really took off. This was a gigantic upheaval of the entire company. This is where you grow as a personality. I was in Japan a lot at that time, and even tried to learn Japanese. Well, the latter with rather modest success (laughing).

➔ That sounds like a steep learning curve.
Absolutely, that was a huge learning curve for a young engineer, culturally, professionally, in terms of sales. Later, I became active in medical technology. Most of the production of endoscopy technology took place in Hamburg. There, the issue again was digitalization, such as digital image recognition. But then things became difficult, because Olympus got into trouble due to a stock market scandal.

Therefore, I switched to Bosch, or more precisely, to its subsidiary Blaupunkt in Hildesheim. Car radios, car hi-fi, the emerging navigation systems – these were consumer-oriented, exciting topics. My focus as Vice President Sales was to separate the aftermarket business from Bosch's OEM business.

From a Japanese to a traditional German, Swabian company – that was a great new experience. Even though a very difficult task was waiting for me, because here, for the first time, it was not a matter of building up, increasing development, and new tasks, but of consolidation, strategic developments, and much more about the business management issues. This kind of thing is not always easy. Staff reductions, new structures in sales – there were also many bitter moments. But profitability was achieved, the automotive business was merged with other Bosch activities, and the brand business was sold two years later.

➔ And then you took the plunge into Baden?
Yes, after this successful reorganization, I was supposed to go to the Diesel Division in Abstadt. But these diesel injection pumps were not necessarily my product image of the future. Then I heard about a connector manufacturer in the southern Black Forest, the company Metz Connect in Blumberg, and their new focus on data connectors. They desperately needed someone who knew something about marketing, structure, and financing. A family business of just 600 people in an industry new to me with connectors and electronic control components.

At that time, I was the first General Manager ever recruited from outside. This required a great deal of personality and cooperation with the entrepreneur. The role was actually planned to last for three years, after which the sons were supposed to take over the Executive Board. It turned into a total of ten years, though.

➔ How did you then find your way back to East Westphalia?
During this period, I of course had contact with Phoenix Contact from time to time. After all, the world of connectors is quite transparent – and Phoenix Contact has a good reputation. And so my desire to work more closely with this company grew. At that time, there were no plans to return to East Westphalia. But OWL and connectors just belong together. Then, at the beginning of 2016, I was given the opportunity to join Phoenix Contact.

> "Japanese was followed by Alemannic, with the scratchy throat similar to the Swiss."
>
> Torsten Janwlecke, COO Phoenix Contact, on the changing cultures of his career path

➔ What attracted you to Phoenix Contact?
Technology, the down-to-earth attitude, and the idea of a family business in which the owner still plays an essential role appealed to me. For me, it was important to realize that the connector business is actually an established business,

but one that offers great opportunities for growth and, above all, earnings. And I have always enjoyed growing sales and revenue. There was also the restructuring from a division into a Business Area (BA).

➔ How does your role as a member of the overall management team harmonize with your role as the person responsible for your Business Area Device Connectors?
Perfectly! The respective Business Areas have been enjoying even better representation on the Executive Board as a result of this setup. And the Executive Board has a direct link to the operational business. The close exchange within the management level then has a positive impact on the individual Business Areas and Corporate Functions, such as Logistics and Purchasing.

➔ Has any thought been given to deepening the autonomy of BAs down to the subsidiary level?
From the customer's point of view, that would be counterproductive. We have many customers who do not source products from just one Business Area or segment. And for them, increased separation would be detrimental. We benefit from our enormous overall portfolio and strong brand, and would lose a lot of strength if we were completely independent.

➔ From your point of view and with your experience in different types of organizations, are we still a family business?
Yes, definitely. Despite our size and organizational form, we still present ourselves as very medium-sized and family-based. I see that as something very positive. Family ownership and this culture – for me, that is the German SME in the very best sense.

And we are also still truly German, with all the associated advantages and disadvantages. But we are, of course, becoming more international, though perhaps not immediately more global.

➔ You have often been involved in businesses that have been drastically changed by disruption, from photography to car radios. What is the next step for device connections, for printed circuit boards?
Naturally, an increasing integration process is also taking place in the field of connection technology. Many devices today are communicative, connected to networks, and used to control processes. If you think about the topic of building technology alone, then I have a display here in this room, for example, that can now do much more than just the classic task of switching an electromechanical switch on and off. Functions are integrated, status messages are displayed, and the display has functions for controlling air conditioning, lighting, and sound and video technology.

Torsten Janwlecke is COO and also President of the Business Area Device Connectors

Integration in semiconductor technology has also brought with it newer and newer generations of devices and corresponding circuit boards – and has thus also changed the requirements on the connection technology. More compact designs, environmental requirements, higher variability, and the ability to transmit data at high frequencies are certainly the most important. I have to point out that I do not believe that wireless technology will replace cables and plugs. Because there are still many future options for both components. Mobile devices powered by batteries will certainly be able to be operated more and more "wirelessly", but not without connectors – at the very least, they will be necessary for recharging.

Think of our vision of an All Electric Society. The energy transition initiated by climate change alone – towards renewably generated electricity as the main form of energy of the future – is generating immense demand for connection technology. Whenever power transmission is involved, the future of connector technology is assured anyway. If anything, there will be more and more connections due to the electrification of our surroundings. An ever-growing number of previously mechanical or electromechanical parts are being replaced or improved through smart technology. The plugs may become smaller, may change technologically. But without connections, it won't work. It will stay with us! (lo) ■

Protiq celebrates its anniversary

A five-year success story with continued bright prospects

In 2016, the Rapid Solutions division of Phoenix Contact became an independent company. Dr. Ralf Gärtner is the founder and General Manager of Protiq GmbH. “At the time, I saw the potential of bringing our services to the market and thus generating external sales.

In the meantime, Protiq has long since outgrown the status of a start-up. Today, the team manufactures various prototypes, tools, and individualized products on around 20 machines. In addition to customers from industry, the customer base also includes private individuals. For the latter, Protiq has already produced spare parts for classic cars, dishwashers, and washing machines, as well as model-making accessories and personalized gifts ranging from cookie cutters to trophies.

Speed and, above all, innovation drive the business: Printing pure copper is almost old hat for the Blomberg-based company, but now zinc, TPU and, more recently, even glass are also leaving the production facilities from the 3D printer.

The online marketplace is a central element of the high-end print shop. Nearly 140 materials are available for selection on this Protiq Marketplace, as well as 17 different manufacturing processes. The special feature: Other suppliers from the industry are also represented on the online marketplace.

protiq.com

Dr. Ralf Gärtner

Accolade for a mini

NSR elementary relay comes out the winner

Who invented, developed, and installed it? In the case of the NSR elementary relay, it was neither the Swiss nor the Blomberg team, but a small group of developers from Berlin, who brought their product to series production readiness at the Phoenix Contact location there. Now, its development is receiving a special form of appreciation – it is entering into a partnership with a global relay expert.

The elementary relays, which have received numerous awards and patents, have been manufactured at Phoenix Contact in Bad Pyrmont since 2015. This will change in the future, as a long-term partnership agreement has now been signed with TE Connectivity. This industry giant, headquartered in the USA and with European headquarters in Switzerland, specializes in relay technology.

Ulrich Leidecker, COO and, as President of the Business Area Industry Management and Automation (IMA), involved very closely in the development of the relay, says, “TE Connectivity’s expertise in engineering, production, and distribution will take the marketing of NSR technology to a new level and open up additional markets.”

update.phoenixcontact.com

Next-generation connections

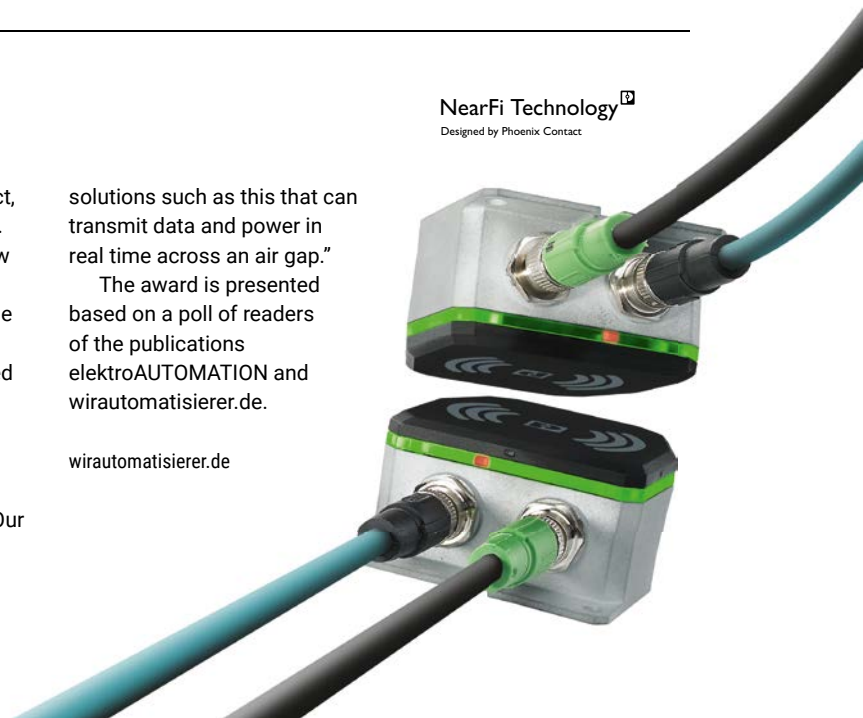
Award for the connector of the future

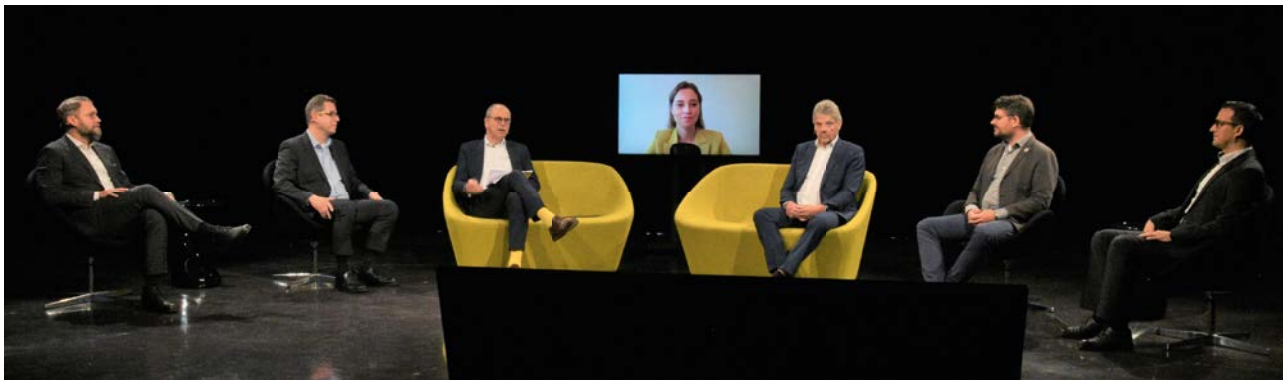
Only just launched on the market and already a winner: The new NearFi coupler from Phoenix Contact has won the Konradin Media Group “Automation Award 2021”. Victory was won by a wide margin, even though the technology is actually pretty much the exact opposite (see starting on page 26).

The NearFi coupler transmits both data and power without direct contact, i.e., without cables or plugs. “The NearFi coupler is a new technology from Phoenix Contact that is unique on the market. This has now been recognized,” says a delighted Jörg Brasas from Strategic Product Marketing in the Communication Interfaces department, speaking on behalf of the entire team. “Our customers are looking for solutions such as this that can transmit data and power in real time across an air gap.”

The award is presented based on a poll of readers of the publications elektroAUTOMATION and wirautomatisierer.de.

wirautomatisierer.de





Talk with matching socks – in the studio and with digital guests

On the Yellow Sofa

Exciting new format with record attendance and guaranteed continuation

When it comes to norms and standards, an intellectual flight reflex sets in for many people. Dry-as-dust subject matter, tedious maneuvering through deserts of letters, abbreviations, and detail clutter for nerds. But it can also be completely different. The colleagues from Phoenix Contact Competence Center Services recently demonstrated how on the Yellow Sofa. The subject was and is the new Machinery Products Regulation of the European Union. More than 600 participants registered for the first Safety Talk in mid-November. And around 500 interested people were permanently on site digitally and live when the host Frank Knafla (Head of Business Development Building Technologies Phoenix Contact), wearing color-matching socks, invited his six studio guests to talk on the Yellow Sofa in the Media Hub at the Hannover Messe.

It turned out to be a lively and exciting discussion that provided interesting insights into the world of design and its security, whether machine or cybersecure, even for those interested who are not themselves mechanical engineers. And it will not be the last of its kind. Because Torsten Gast, as the idea generator and initiator of the Safety Talk, explained that there will be further workshops on the topic in the spring of 2022.

blog.phoenixcontact.com/services

New name, new tasks

Sparking safety

When you hear Trabtech, you think of Phoenix Contact surge protection. Since 1983, this name has stood for innovation when it comes to the controlled dissipation of excess electrical energy.

In the meantime, however, the spectrum has extended significantly beyond pure surge protection, even though the topic of "protection" is still the core of the brand. Circuit breakers are devices that protect against overcurrents, and EMC filters provide protection against spark interference and harmonics. Therefore, the Business Unit Trabtech will now become "System Protection Technologies".

Trabtech will not disappear completely, because when it comes to lightning current and surge protective devices, this name will continue to stand for innovation and safety from Blomberg.

update.phoenixcontact.com

Virus under control

PSIRT team responds quickly to new vulnerability

It is not only biological pathogens that are currently affecting our lives. Viruses also pose a threat digitally. Recently, a public warning from the German Federal Office for Information Security (BSI) even made it to the headline news. Phoenix Contact also had to face this danger.

"Log4j" is a name that means nothing to the normal user. But for Java developers, this is the common name of a library they work with. According to the BSI, this widely used library had a serious security vulnerability, which has probably already been discovered and used by occasional bad actors.

Phoenix Contact has its own Product Security Incident Response Team (PSIRT). These experts are always active when it comes to solutions delivered to customers. The news quickly came from colleagues that neither our hardware-based products with firmware nor our software products were affected.

blog.phoenixcontact.com/services

Bernd Horrmeyer

The master of standardization

Bernd Horrmeyer receives award

When it comes to the standardization of Phoenix Contact's electromechanical products, it is very likely that Bernd Horrmeyer was involved. Connectors, PCB terminal blocks, fiber-optic connectors, e-mobility products – the Master Specialist Standardization has been involved in various standardization projects worldwide for many years.

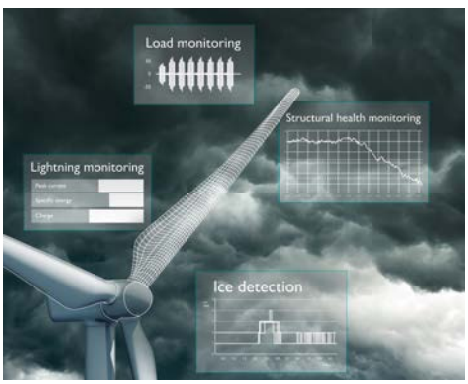
Now, the International Electrotechnical Commission IEC has presented him with the IEC 1906 Award for his outstanding commitment to various committees and working groups of the Commission. It is the second award of its kind for the engineer of precision technology and economics. He was honored once before, 12 years ago.

iec.com

Wind monitor with reinforcement

Structural monitoring extends Blade Intelligence

Wind turbine generators are persistent heavy-duty workers. Enormous forces act on the entire system, and in particular of course on the rotor blades. And these forces are also very erratic. Sometimes gales whistle across the system; sometimes chunks of ice hang from the blades; sometimes there are stops due to a shutdown. This tugs and tears away at the fiberglass woven structure throughout its service life. One way to detect a weakening of stability is to monitor the vibration behavior of a rotor blade. If it changes, the cause could be a stability problem.



In the future, there will be an extended cooperation with the Wölfel Group from Höchberg in Franconia. Because these experts are specialized in exactly this structural monitoring. Their expertise fits perfectly into Phoenix Contact's own Blade Intelligence system, which keeps an eye on the entire system. This adds an important function to the Blade Intelligence modular system for the comprehensive monitoring of rotor blades.

woelfel.de

Filderstadt remains and becomes Indian

Renu Electronics acquires HMI subsidiary

Phoenix Contact will sell its Filderstadt-based subsidiary Phoenix Contact HMI IPC Technology to Renu Electronics Pvt. Ltd, a global manufacturer of industrial electronics and factory automation products.

The company was founded in 1968 as Sütron electronic GmbH. Since 2008, the quality leader for "Human Machine Interfaces" (HMI) has been operating as a wholly owned subsidiary of Phoenix Contact. The Indian company Renu Electronics has been developing and producing a part of the HMI devices portfolio for several years. Now, these synergies will be extended, with production remaining based in Filderstadt and products also being available as usual.

renuelectronics.com

Chart toppers

Phoenix Contact one of the Top 3 Workplaces

Stern magazine and the number crunchers at Statista asked around 50,000 German employees about their favorite professional workplaces.

Phoenix Contact came third in the "Electronics and Electrical Engineering" category, behind Sick and Infineon, but ahead of industry giants like Bosch Rexroth, Stihl, Festo, and Kärcher. It is also noteworthy that the Blomberg-based company is the only one located north of the Rhine-Main line.

statista.com

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The next issue will be published in May 2022:

City

Urbanization is a global megatrend.
But it is not just the metropolises that are growing ever-larger; medium-sized and small cities are also facing new challenges. How will life in cities develop? Which technological developments help, and where can Phoenix Contact become involved?

SMART CITY

On a voyage of discovery

Lemgo is a small town in East Westphalia. But systems are being developed here that could become a blueprint for major cities.

RESOURCE

On a low flame

How state-of-the-art automation makes thousands of homes warmer efficiently.

MOBILITY

On a short journey

There is hardly any area of transport where electrification makes more sense than in public passenger transport. Report from a Dutch e-bus factory.

“The world is made up of the five elements
fire, water, air, earth, and ether.
The first four are earthly in nature,
the fifth fills the heavens.”

Aristotle,
ancient Greek philosopher

“You’d be lucky,
if the air was as pure as beer.”

Richard von Weizsäcker (1920–2015),
former President of the Federal Republic of Germany

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