

DENKFABRIK

NEW IDEAS FOR TOMORROW'S TRANSPORT

DIGITALIZATION
AUTOMATION
SUSTAINABILITY
ELECTRIFICATION

RECIPES FOR SUCCESS

The ingredients good logistics require

+ EXPERTS AT THE COOKER

Krone's Denkfabrik develops ideas for the logistics of tomorrow

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HOW DO YOU DEFINE SUCCESS?



My house, my car, my business card - anyone who thinks this is the common definition of success could be mistaken. According to a representative study commissioned by LinkedIn, which examined how Germans define success for themselves, professional successes play a rather subordinate role for employees. For only a good quarter (27 percent) of those surveyed, professional milestones are a success,

and financial aspects such as a salary increase (16 percent) or a six-figure salary (12 percent) are also rather unimportant. Rather, a happy private life is more important than a career. Being **happy** (72 percent), being healthy (71 percent) and having family and friends (49 percent) are more important criteria for success.

source: bit.ly/3vxWR07

Dear readers,

“Zero emissions by 2030” is the big goal - we at Krone are thinking even further and taking on the “Mission Beyond Zero”: At the IAA 2022, we will present the eTrailer, a technology that not only makes the trailer more sustainable and efficient, but also reduces the fuel consumption of the tractor unit by up to 40 percent. This shows once again the importance of the trailer for transport and how much it can contribute to greater sustainability. The eTrailer is by no means everything: we are bringing eleven products to Hanover, from our market-proven Profi Liner to other innovations such as our Box Liner Automatic, where the driver can adjust the chassis to the container size fully automatically in just one minute at the touch of a button. This makes port handling a third more efficient. Such products are only possible because we always stay in contact with you, our customers, and take your wishes and requirements seriously - and turn them into economical solutions. All the more reason for us to look forward to talking to you personally again at the IAA. When it comes to product development, we also draw inspiration from strong partners, experts and start-ups who - like us at Fahrzeugwerk Krone - are professionals in their field. Cooperations are the future: we initiate and cultivate them. Among others, with our expert platform Denkfabrik, which reveals its recipes for success for a successful industry in this issue.










Bernard Krone,
Chairman of the
Supervisory Board of
the Bernard Krone
Holding SE & Co. KG

Bernard Krone
Yours, Bernard Krone

TITLE: ADOBE STOCK/TARTILA PHOTOS: ADOBE STOCK/PIXEL-SHOT, KRONE

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Blue Notes

News from the world of Krone

HAPPY BIRTHDAY!!



Multi Safe celebrates anniversary

Krone revolutionised the load securing system 20 years ago with this innovation.

The Multi Safe system from Krone has been reliably securing loads on curtainsiders for 20 years: since it was introduced in 2002 as Multi Lock/Multi Block, its design principle has established itself as the standard for load securing systems on European flatbed trucks. At that time, Krone was the first manufacturer to be awarded the Trailer Innovation Prize at the IAA Commercial Vehicles. Heinz Evers, the Krone engineer, was behind the innovation: he came up with the ingenious idea of using a perforated profile in the outer frame instead of welded-on strapping rings. This profile has around 130 strapping points on each side of a 13.6-metre curtainsider - the DIN for heavy vehicle classes requires twelve strapping points. Krone has continuously developed the Multi Safe System as a

modular system for all conceivable load securing tasks. The combination of the patented Multi-Lock outer frame and the robust Multi-Block loading beam allows more than 3,000 strapping variants. Further expansion stages of the system are the additional flexible front wall Multi Wall, Multi Fix for pipes, round steel or metal sheets, Multi Block Paper for paper rolls, the screwable pallet stop elements Multi Screw, Multi Rail as an additional, central lashing rail for building material trailers and the tensioning strap system Multi Strap, which can be moved over the entire length of the load. With heavy-duty lashing eyes, a punctual reinforcement of the Multi-Lock outer frame, even loads of up to 4 tonnes can be secured. The Multi Lash extension module also enables the universal use of all hook shapes on lashing straps. ↪



Management Support

Astrid Janke has been a member of the Krone Commercial Vehicle Group's management since April 2022. The experienced head of design and development is a newcomer to the company. Previously, the engineering graduate worked for Daimler and Airbus, among others, and most recently as Vice President Product and Technology Strategy at the intralogistics provider Kion Group. She attaches great importance to good cooperation within the company, wants to encourage and support people and accompany diverse teams in their growth. ↪

AI combats trailer downtime

Krone's "value chAI'n" project investigates ways of optimising product and process quality, performance and availability with artificial intelligence (AI). The aim is to achieve error management across the value chain. Four specific use cases have been defined, including one in the production facility in Lübbthen, where Krone Cool Liners are manufactured. There it should be possible to predict product quality in production based on observable input variables such as plant parameters or environmental conditions. The research project, which is funded by the Federal Ministry for Economic Affairs and Climate Action (BMWK) as part of the "New Vehicle and System Technologies" programme, is scheduled to run for a total of three years. ↪



New management in Tire

The long-standing CEO of the Krone plant in Turkey, Riza Akgün, left the Krone Commercial Vehicle Group at the end of July and handed over the management of the production site to **Kartal Erköy**, Managing Director Production, and **Semih Pala**, Managing Director Finance/Sales. Krone has been producing trailers for the Turkish market and for markets around Turkey at the Tire factory since the end of 2012. ↪



PHOTOS: KRONE

Krone supports study on capacity bottlenecks

The consortium study "Meeting capacity bottlenecks in logistics: situation analysis - solutions - potentials - packages of measures - roadmaps", which started in February 2022, aims to explore the driver shortage and its impact on transport companies and their customers. As a consortium partner, Krone is also actively involved in this ground-breaking project and contributes its know-how to the various aspects of the study. Findings are continuously published on [logistik-digitalisierung.de](https://www.logistik-digitalisierung.de). ↪



Many cooks serve the right ingredients

From left to right:
Oliver Detje, Berit
Börke, Anthony
Wandt, Simon
Richenhagen,
Christian Kille, Axel
Plafß, Wolfgang
Thoma, Frank Albers,
Johannes Berg

The experts of the **Krone Denkfabrik** have met again in Hamburg to discuss the ingredients for a sustainable logistics and transport industry. Here they reveal their recipes for success.

An evening in Hamburg in May 2022: Seven people from transport and logistics stand at the cooker of the cooking school “La Cocina” and together create three courses of a sophisticated menu - beef carpaccio with parmesan and rocket, pork neck with gnocchi and stracciatella cake with ice cream. Numerous ingredients are cut, grated, chopped, stirred - and the discussion continues. Beforehand, the experts have already sat together all day and talked about the current challenges of the industry: Krone specifically networks them with each other on the Denkfabrik platform to

jointly develop new ideas for the future of transport and logistics. “Each and every one brings expertise and experience from their own field, and it is precisely this diversity of ingredients that makes for success,” explains Simon Richenhagen, Marketing Manager of the Krone Commercial Vehicle Group.

Taking the industry forward

The members of the think tank have diverse backgrounds, specialising in combined transport, electromobility, research, media, digitalisation

or start-ups. What they all have in common is a passion for the industry and a desire to keep pushing it forward - they are true thought leaders. They not only have different knowledge, but also individual experiences, perspectives and opinions in their luggage and thus spice up the exchange, bring forth new approaches or inspire each other to do so. The idea behind the Denkfabrik format is above all to meet regularly, away from day-to-day business and to encourage open discussion. Just as very tasty dishes are created in this Hamburg kitchen on this evening, because it is precisely these people who stand together at the cooker and bring together diverse ingredients. And just as beef carpaccio, for example, requires good meat, precision in cutting, aromatic olive oil and a little sea salt to develop its full flavour, the industry is also dependent on smart minds and their approaches in order to constantly develop further.

All the experts at the think tank agreed at this meeting: transport and logistics are currently facing many particular and complex hurdles. From climate protection, a shortage of skilled workers, pandemics, mobile working and global supply chains that can hardly be planned any more, to rising raw material prices and energy costs, to the lack of guard rails for alternative drives. From the reorganisation of infrastructures and digital transformation to new global players who want to exercise great market power against the threat of cybercrime. And in some cases, they are also very personal, human issues: “Employees in the companies sometimes live in constant worry and fear - about health, financial security or global stability,” says Axel Plafß, managing principal partner of the Zippel Group. For the entrepreneurs in the industry, this means: they have to combine all their strengths to meet all the demands placed on them. →

+ WOLFGANG THOMA

Wolfgang Thoma is managing partner of Spedition Ansorge GmbH & Co. KG and a trained lawyer. As an entrepreneur, Thoma is a pioneer in the field of electric mobility: together with partners, he developed the purely electric tractor "Elias".



"Management of the shortage"

Professor Christian Kille from the Institute of Applied Logistics at the University of Applied Sciences Würzburg-Schweinfurt cites "management of the shortage" as one of the most important tasks at present. Among other things, he says, there is a shortage of raw materials, containers - and above all of skilled workers, not just drivers, but people in all departments of a transport or logistics company. To combat the shortage of skilled workers, he recommends, among other things, more targeted communication about the industry, its services and potential, because: "The more people learn about logistics and really get to know and understand it in depth, the higher they experience its relevance. That's why it's important to reach young people in particular with this information - because they can be the skilled workers of tomorrow." Kille gave another impulse to the round that can promote environmental protection: "If the areas available for logistics alone were equipped with photovoltaic systems as extensively as possible, this would have very positive effects. You could completely roof - over car parks, for example." His thesis: "Logistics can even become climate positive! We can work on not only ensuring security of supply for society, but also helping to become energy self-sufficient." That is a lofty goal, he admits. But he motivates thinking through such ideas - because they make new ways and actions possible.

Listening carefully to customers

Every entrepreneur probably has a very individual recipe for success to lead his own company through crises as well as through calmer times. "We always listen very carefully to our customers about what they want," says for example, Wolfgang Thoma, managing partner of Ansorge Logistik. For some time now, one of the most pressing wishes from their side has been the reduction of CO₂ emissions during transport. Ansorge is continuously converting



its fleet to e-mobility, is working on hydrogen and e-fuels, and on shifting traffic to rail. "Digitalisation is also helpful. Among other things, it offers very good approaches for warehouse logistics, which provides the material for the supply chain. Today, we already have very powerful systems that can meet all the corresponding customer needs."

For the experienced entrepreneur, above all, foresight is an important formula for success - today more so than ever: "If we look at the current global political situation, a lack of planning certainty is one of the greatest constants, and it challenges us very strongly. Not only with Russia's invasion of Ukraine has it assumed almost infinite proportions. We don't know what tomorrow will bring. We are driving in thick fog and the engine power is still excellent, but no one can predict when there might be a collision. Nevertheless, as entrepreneurs, we have to prepare ourselves and react quickly in case of an emergency."

Politics must set the course

However, major political upheavals cannot be absorbed by individual entrepreneurial decisions. "In logistics, for example, we can handle inventory increases in the short term," says Thoma.

"But everything else can only be influenced by the government. It has to create the conditions under which we can all work well and fulfil our tasks for the economy and society." According to Thoma, another important ingredient for long-term success is innovative strength: "At Ansorge, as a medium-sized company, we built the first fully automated high-bay warehouses in the mid-1990s. With this, we already initiated automation at that time." Innovation always requires a willingness to change: "Anyone in the transport business who has always wanted only to drive from A to B certainly has a problem today." Krone has always stood for consistency and innovative strength at the same time. The brand supports its customers in carrying out transport as efficiently, safely and economically as possible. "Our recipe for success is uncompromising quality coupled with great openness to new developments," says Simon Richenhagen. Throughout its decades-long history, the company has always been closely at its customers' side, developing products and services that are practical, robust and at the same time cost-efficient. "We are a strong partner - and network with other players who demonstrate excellence in their subject areas to provide the best solutions for our customers." Thus, he says, the think tank is also an example of how Krone networks with experts, exchanges ideas with them and also opens up for them.

Increasing the efficiency of transport

Many other approaches underline this ideology: for example, the company cooperates with startups and has developed an electrically driven mega-trailer with Trailer Dynamics (see p. 16). With Liebherr, Krone has launched the Celsineo brand: a modular refrigeration unit for trailers that has already been successfully launched on the market and is revolutionising the industry. The cooperation with Liebherr is currently being

+ ANTHONY WANDT

Anthony Wandt has been managing partner of Wandt Spedition Transportberatung GmbH since 2016 - which offers contract, warehouse and personnel logistics as well as cargo, system and general cargo transport, among other services. He took over the company, together with his sister Aline and is driving its digital transformation.



further advanced by connecting the system to an electrically driven axle (see p. 32). Furthermore, Fahrzeugwerk Krone is developing an innovative chassis in-house (see p. 28) The fully automatic multifunctional Box Liner TU 50 Traction Automatic saves a lot of time when picking up containers and can thus at least somewhat shorten the traffic jams in the ports. "Wherever possible, we use digitalisation and automation to relieve drivers and increase the efficiency of transport," affirms Richenhagen.

Anthony Wandt, managing partner of Wandt Spedition Transportberatung GmbH and member of Krone's Denkfabrik, also relies on networking →

Besides the work at the cooker, there was enough time for further conversations and humorous moments.



+ SIMON RICHENHAGEN

Simon Richenhagen has been responsible for marketing at the Krone Commercial Vehicle Group since 2021. During his Master's degree in Business Administration, the trained automotive salesman worked at an advertising marketing agency in sales and business development, and in 2016 he joined Krone as Marketing Manager. In 2018, he switched to the company's brand management and dedicated himself to brand positioning in the digital environment.



to further expand his company's success: "The transport of the future will certainly be even more characterised by cooperation than it is today. Transport modes will be increasingly networked, just like information." At the same time, he says, not only ecological sustainability should grow, but also social and economic sustainability. Wandt believes it is almost certain that the supply chain will not only be disrupted in the short term - he expects lasting unrest. This makes it all the more important, he says, for entrepreneurs to move forward with the right

attitude: "The tasks we face are so diverse and challenging that above all it is important to keep a cool head and decide prudently which issues to enter into and how to reconcile them."

Avoiding transports instead of relocating them

In its corporate culture, Wandt Spedition relies on a cooperative atmosphere in which the doors are always open for all employees. "Especially in view of the growing pressure on both companies and each individual, we cultivate a family-like approach to our employees all the more. We are aware that it is their lifetime that they invest in their job. We feel responsible for them and support them in their individual needs and desires." The importance of the industry, and thus the work of all those involved in transport and logistics, is something that his team and he constantly make clear to everyone in the company: "We try to tell every employee how important the tasks are that they do."

For logistics of the future, Wandt believes it is essential to think less about hauling loads and more about how transport can be avoided: "By consuming less, by bundling transports or relaxing time windows - there are many possibilities." Sometimes a dish tastes even better if you don't overload it, but deliberately leave out two or three ingredients. ↩

Cooking requires good ingredients - and skilled hands to process them. The members of the think tank Denkfabrik were also a perfect team at the cooker.



PHOTOS: STEFAN BUNBERT, KRONE

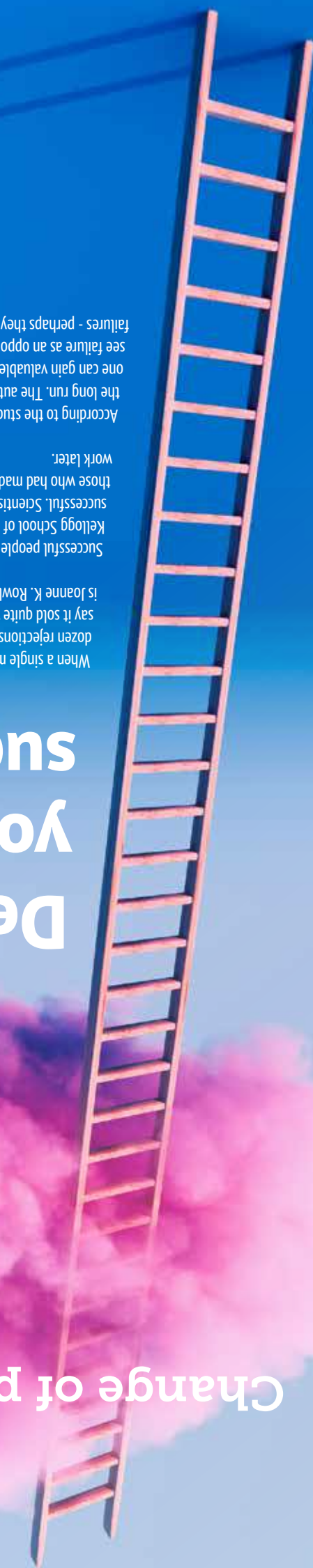
Defeats make you more successful

Change of perspective

When a single mother from England sent her novel to publishers in the mid-1990s, she got a dozen rejections. Only the 15th publisher accepted and published the book in 1997. Let's just say it sold quite well: The book is called "Harry Potter and the Philosopher's Stone", the author is Joanne K. Rowling, and her stories have now sold around 500 million copies.

Successful people have often had to accept defeat in the past - but according to a study by the Kellogg School of Management at Northwestern University in Illinois, that makes them even more successful. Scientists were interviewed who had received a grant for their work early on - and those who had made their way without a grant. The second group had published more successful work later.

According to the study, an early career bump can even ensure that supposed "failures" do better in the long run. The authors of the study conclude that defeats can provide enormous impetus because one can gain valuable insights from them, and that this is often "surprising and also inspiring". So see failure as an opportunity to learn something and gain new motivation. And don't grieve over past failures - perhaps they were more important than you previously thought! ↗



The digital trailer optimises efficiency

The truck consumes oil, water, diesel or battery power - it is the trailer that carries the goods and can optimise the vehicle's efficiency. Krone offers the digitalisation of **transport management** in three stages, with open interfaces for seamless integration. This allows the trailer to be fully utilised in the digital transport chain.

Level 1:

Determining the position of the trailer - the basic function on the way to the digital trailer

By installing a Krone Telematics Box, transport companies lay the foundation for the networking of their fleet and the digitalisation of their trailers. The basis is vehicle tracking, all other functions can be easily added at any time if required. They increase the efficiency of transport and offer solutions to meet the challenges of the industry: Automation and digitalisation spare skilled workers, and transport becomes more sustainable. Becoming CO₂-neutral as a transport company is a big task - Krone is the partner on the way.

Level 2:

Sensors on the trailer make the vehicle intelligent

Sensors on the EBS braking system, on the doors or on the refrigeration unit open up a wide range of possibilities to make transport safer, more efficient, more economical and more climate-friendly. Smart Tyre Monitoring can be used to monitor tyre pressure and temperature, for example. If the pressure is too low or the temperature too high, the driver or dispatcher is alerted. Smart Pairing stands for the digital recognition of the tractor unit with the help of Bluetooth technology and its linking with the towed trailer: This is also visually displayed in the Krone Telematics Portal. In refrigerated vehicles, the temperature is continuously monitored and deviations are reported. Door Protect secures the rear doors as well as the side walls and roof of the trailer against unauthorised access.

Level 3:

How are the goods and how is the cargo space? Krone solutions can answer these questions.

With Smart Capacity Management, Krone has developed a digital camera system that uses an algorithm to detect free loading space and displays it visually in the Telematics Portal. The data flows into transport management systems (TMS), which allow to fill the trailer automatically. In this way, transports can be utilised to a greater extent, and free loading space can even be offered for use via freight exchanges - generating additional revenue.

Thanks to open interfaces the entire system is compatible with every application desired, so it can be used in multi-brand fleets without any problems - the trailer is integrated seamlessly. All data generated with the trailer is also available for additional applications, such as transport or fleet management systems and ERP accounting programmes.

ILLUSTRATION: MANUELA HEINS

POSITION

The intersection of longitude and latitude is the basis for almost all telematics services. The integrated mobile phone card of the KSC box ensures that the location is transmitted to the desired systems. Vehicle and cargo can thus be permanently located.

TPMS

Krone's TPMS tyre pressure monitoring system permanently measures and checks the pressure and temperature in all the trailer's tyres and visualises the values in the tractor unit as well as in the Telematics Portal and the Krone Telematics App.

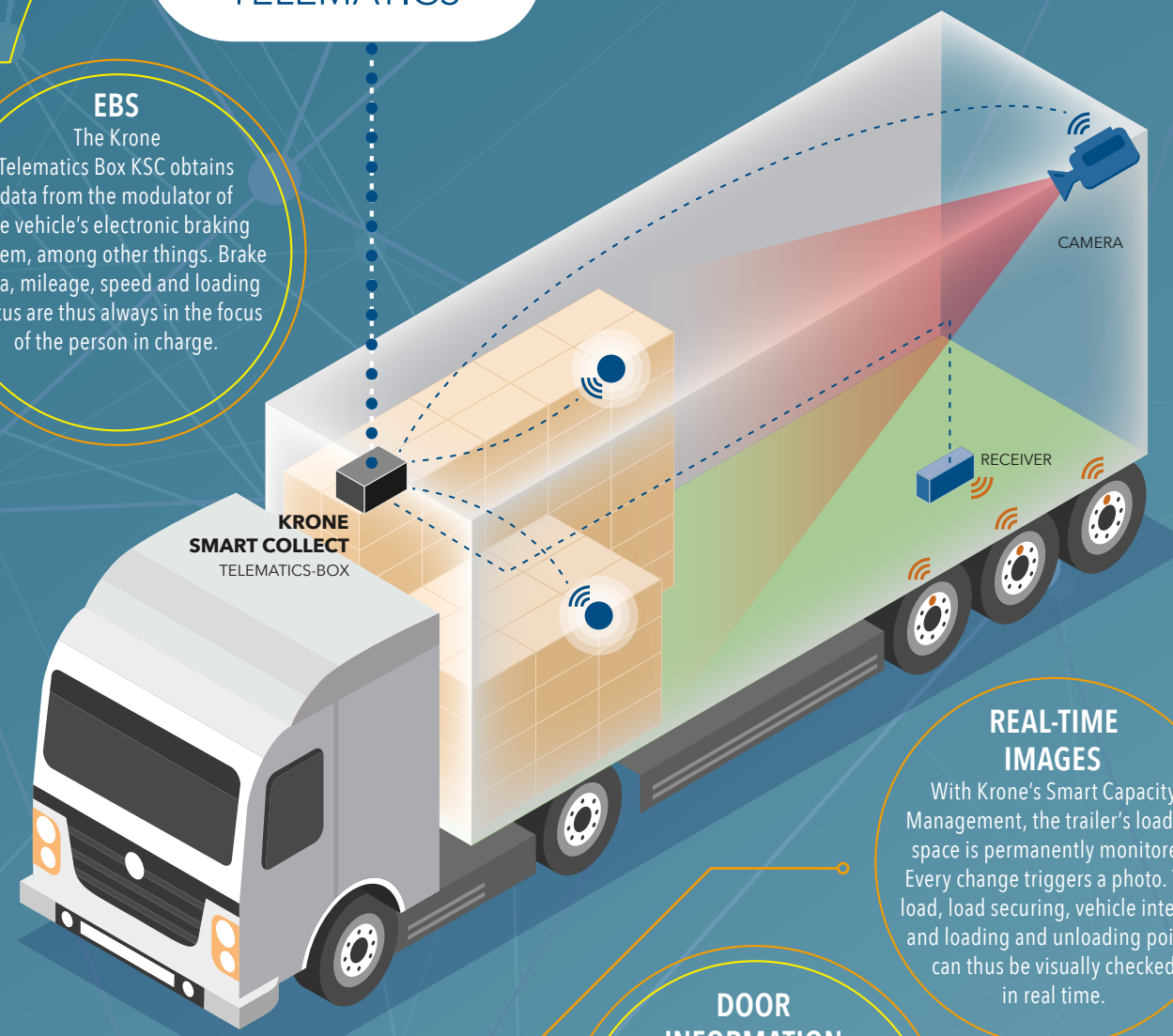
INFORMATION ON THE REFRIGERATION UNIT

Refrigerated cargo is particularly sensitive and valuable. The services of Krone Telematics help to handle the goods correctly. The Krone KSC box transmits temperature values (adjustable), aggregate condition and tank content.



EBS

The Krone Telematics Box KSC obtains data from the modulator of the vehicle's electronic braking system, among other things. Brake data, mileage, speed and loading status are thus always in the focus of the person in charge.



REAL-TIME IMAGES

With Krone's Smart Capacity Management, the trailer's loading space is permanently monitored. Every change triggers a photo. The load, load securing, vehicle interior and loading and unloading points can thus be visually checked in real time.

DOOR INFORMATION

Sensors on the doors report any access to the box body. In the Door Lock extension, Krone services also enable remote unlocking of the load compartment from the Krone Telematics Portal and App.

The engine moves into the trailer

In cooperation with Krone, the start-up **Trailer Dynamics** is developing an electric axle that operates independently of the tractor unit. Trailer Dynamics Managing Director Abdullah Jaber reports on the concept, which is intended to contribute to the industry's decarbonisation.

If you want to power a 40-tonne truck electrically - why not put the battery in the trailer instead of the tractor unit? This idea gave rise to the eTrailer, which the Aachen-based start-up Trailer Dynamics and Krone developed together: a powerful electric axle that works independently of the tractor unit. Abdullah Jaber is one of the smart minds behind the system: as managing director of Trailer Dynamics, he is the technical director. "If you really want to drive emission-free in heavy goods transport, the tractor unit is only capable of carrying the battery to a very limited extent in terms of its load capacity and volume. But the trailer has everything: it can carry and stow the battery without exceeding the permitted axle loads."

Combined with a diesel vehicle, an electric plug-in hybrid is created

The electrified axle replaces one of the conventional axles in the trailer. Via a sensory kingpin, the electric driveline can be tracked reliably and in real time, even without control inputs from the tractor unit. The system can be combined with all common tractor units. These are supported with the additional eAxle power in the drive and can also be dimensioned smaller - thus reducing both the running operating costs and the total cost of ownership. The combination of eTrailer and diesel vehicle creates an electric plug-in hybrid. Diesel trucks thus become less CO₂-intensive, and the eTrailer enables electric tractor units to achieve a noticeable increase in range. Technically, Jaber compares the eTrailer to an e-bike: the tractor unit and the eTrailer are mutually interchangeable and communicate with each other, but not much - just as is the case with a cyclist and his or her e-bike. The

cyclist operates the pedals and brakes, but not much else is needed to move forward. In the same way, he says, the eTrailer has to anticipate to some extent independently what the driver in the tractor is doing: "When he goes into a bend or stands at the traffic lights, the trailer must not give thrust independently." The eTrailer, just like an e-bike, makes driving resistance less and helps the tractor unit to come up against it more easily. The trailer accounts for up to 70 percent of the driving resistance anyway - so the control system is in exactly the right place.

Discrepancy between emission targets and efficiency

Actually, Abdullah Jaber, a physicist by training, has long been concerned with topics such as the nature of gravity. But in his diploma thesis, he had pursued the question of how commercial vehicles can become more efficient. At the time, he recognised the discrepancy between NOx emission targets and the efficiency of diesel engines: "The cleaner a vehicle is,

The eTrailer was awarded the "Innovation Award" of the Zenit network as well as the eco-performance Award as an electric powertrain for long-haul trucks in 2022.



"We don't just talk about climate change and problems, we actually do something."
Abdullah Jaber



the more difficult it is to reach maximum efficiency. In addition, of course, the needs of the transport companies play an important role. They want to transport as much volume and payload from A to B as possible. Considering the previous specifications regarding the length, width and height of vehicles, we have therefore suggested that the legislator should give more space, for example, to improve aerodynamics." Because the customer naturally

wants a cargo space with maximum payload and the largest possible useful volume. More payload would also be desirable because the batteries add weight: "Of course, there were no solutions then in those directions." With a designer and several engineers, Jaber later developed a so-called inflatable aerodynamic application for commercial vehicles, which improved aerodynamics. At that time, they were already talking to Krone about it: "But we →

were perhaps a little ahead of our time - there were not yet the necessary guidelines that would have allowed such an attachment.”

The vision of the electrically driven trailer

In 2018, Jaber and a small team jumped in at the deep end and founded Trailer Dynamics with the help of investor Michael Nimtsch. The vision: to develop an electrically powered trailer that could contribute to the decarbonisation of the economy and to sustainable, environmentally friendly logistics for long-distance trucks. And: the trailer should receive the appreciation it deserves. “It was not easy to get our ideas heard. We talked to many large vehicle manufacturers - they didn’t take us seriously or didn’t find the idea practical,” says Jaber. “In 2020, however, we got back in touch with Krone, and COO Dr Stefan Binnewies called me right back the day our documents were on his desk.”

Although Trailer Dynamics was also in negotiations with another potential partner at that time, the choice fell naturally on Krone, because: “You can’t handle a project like this with money alone. You also need enthusiasm, technical support, experience, a production line and a shared vision: we were able to put a big tick behind all of that with Krone.” Both partners complement each other with their strengths: “Krone knows how to build trailers, knows the market, all the technical guidelines and has the experience in communication. And we at Trailer Dynamics add our imaginative ideas.”

Learning from every ‘no’

With every ‘no’ to its approaches that the Trailer Dynamics team has had to digest, it has learned something new, according to Abdullah Jaber. “Whenever someone says something doesn’t work or doesn’t make sense, you question yourself and your product and develop further.” Within only six months, the first functioning prototype was finally created with Krone. “This also means that we were not only able to prove technically that our device works, but also that it is an economic solution.” Many other players in the industry are now also very interested in it.

“In the development of the eTrailer, we were always faced with real challenges. We basically had to reinvent everything and were often pioneers,” explains the technology expert. With the help of a digital twin, we tested how the drive should be designed, how large the battery should be and how strong the drive power of the axle should be: “We learned a lot from this digital model.



From its production hall in Eschweiler, the Trailer Dynamics team aims to make long-haul trucks more sustainable.

+ PROFILE

Trailer Dynamics, founded in 2018, sees itself as a technology innovator and has developed an intelligent electric drive train for trailers that makes long-haul trucks more sustainable. In addition to founders Abdullah Jaber and Michael W. Nimtsch, Jochen Mählmann is the other managing director.

At the moment there are field test vehicles, with a total of around 20 to follow for technical validation. “We are well on track,” says Abdullah Jaber. To solve the problem of insufficient range and long charging times, Trailer Dynamics is thinking about a concept where the batteries can be easily swapped on the road.

Abdullah Jaber feels it is a privilege to be able to deal with all these issues and to help shape climate protection. “We don’t just talk about climate change and problems, we actually do something.” With friends around Prof Achim Kampker, Trailer Dynamics has joined the association ‘Engineers Save the World’: “That might sound a bit out of touch, but behind it there really is the idea of making a contribution. I think we have to offer technical services that make a better world possible - for us and our children.”



PHOTOS: TRAILER DYNAMICS; DAS-DESIGN-PLUS.DE; SABINE SCHMIDT

What continues to move us

More inspiration, tips and thoughts

Any questions?

Mirko Drotschmann explains on his Youtube channel „MrWissen2go“ all the things you never quite understand in the news: the escalation in the Ukraine conflict; what happens when gas runs out; the truth about fast delivery services.... He does this as objectively and neutrally as possible - but if need be, then sometimes with (marked) opinion.

www.youtube.com/user/MrWissen2go



Joy of experimentation

This experimental kit contains a construction set for a precisely controllable robot hand that is three times the size of the human original. Its fingers are moved intuitively by the user’s hand and driven only by water pressure. A completely new feeling of grasping - for left- and right-handers.



www.kosmos.de

Picturesque

„Das zerbrechliche Paradies“ (The Fragile Paradise) in the Oberhausen Gasometer takes visitors on a visually stunning journey through the turbulent climate history of our Earth and shows in impressive, award-winning photographs and videos how the animal and plant world is changing in times of the Anthropocene. The exhibition runs until 30 December 2022.

www.gasometer.de

PHOTOS: KEIN & ABER, KOSMOS, FUNK, DIRK BÖTTGER

How to get things done

Talk less - do more. The authors Mikael Krogerus and Roman Tschäppeler have written „Machen“ a „Guide for getting started, sticking to it and seeing it through“ and provide 41 tools that help not only to make plans but also to realise them. No longer putting things off, but getting them done. And ideally, to find what you are burning for.

Published by Kein & Aber



Culture of error

You learn from your mistakes! This popular wisdom, which comes across almost as a platitude, is the core of much scientific and practical research. Because to err IS human. With the right error culture and an appropriate approach, many processes can be improved and errors avoided. The documentary „Scheitern als Chance - Wie wir aus Fehlern lernen“ deals with this topic. To be seen in the 3sat media library.

www.3sat.de/wissen



The innovative thinkers

Many **start-ups** are pursuing smart ideas for transport and logistics. We present four that make everyday life easier with their products, increase transparency in the supply chain and ensure greater efficiency.

Would you like to get to know these companies? At the IAA 2022 you will have the opportunity: These and other start-ups will be guests at the Krone stand where they will present their business models.

Impargo



Gerhard Hänel and Julian Labeit, Founders

What does Impargo offer its customers?

We offer licence and cloud-based “Software as a Service” solutions for shippers and transport service providers. Dispatchers are supported in their daily business with extensive functions, for example with a truck route planner, a toll calculator, a transport management system and a driver app. The software is tailored to the needs of small and medium-sized companies and is particularly easy to use. And: it is cloud-based and can therefore be easily integrated into a company’s software landscape. Our customers can adapt the range of functions to their needs by flexibly adding more as required.

Your vision?

We want to increase the level of digitalisation and automation in road freight transport provided by small and medium-sized transport service providers and shippers throughout Europe. Our goal is to do away with e-mail, fax and telephone in transport logistics. If we succeed in developing a scalable solution to replace these communication channels, we will create a new infrastructure for cooperation in road freight transport in Europe.

Who are your customers?

Our solutions are user-friendly and easy to integrate, which meets the needs of small and medium-sized companies. Our customers are mainly transport service providers, who form the backbone of European transport logistics, but often do not yet have modern, cloud-based software.

Logistics Cloud



CEO Niko Hossain

What is the idea behind your company?

The logistics industry is massively fragmented: 1,000 companies use 10,000 different software solutions. It is impossible to connect these systems manually to enable data exchange. With ‘logistics.cloud’, we provide a solution that can automate this process and thus enable efficient data exchange between the companies - mostly shippers and logistics service providers.

How can this change transport and logistics?

The efficient and effective exchange of data via our solution enables complete transparency along the supply chain. In addition, the data can be enriched with further information such as IoT data. By collaborating with various partners, it is possible to make ETA calculations for shipments, whereby CO₂ emissions can be calculated at shipment level and shipment flows can be offset via projects..

Who is the target group?

All global players along the supply chain: from shippers to logistics service providers.

Why do you have what it takes to scale up?

We use a no-code technology that can tailor interfaces to customers’ requirements within minutes. The acknowledged model approach to development enables the solutions to be constantly scalable. We take an open approach to the market and do not see ourselves as *the ONE* software solution, but as a connector for all.

Shipsta



CEO David Waroquier and Founder Christian Wilhelm

What does Shipsta do?

Shipsta is an application for shippers who want to compare, manage, digitise and purchase freight rates, while simplifying their logistics processes. Logistics service providers and freight forwarders can use the intuitive supplier portal to easily manage freight rate requests, spot requests and RFIs. The platform provides intelligent analyses, delivers benchmarks, standardises processes and automates the most time-consuming tasks for all parties involved.

What does this mean for shippers and forwarders?

Freight purchasing is simplified, digitalised and centralised, our customers remain agile and unrestricted. Shippers and logistics service providers around the world will be connected. Long-term contract purchases are also possible - the shipper thus secures stable freight rates.

How can this change transport and logistics?

The efficient and effective exchange of data via our solution enables complete transparency along the supply chain. In addition, the shipment data can be enriched with further information such as IoT data. Through our cooperation with various partners, there is the possibility to make ETA calculations for consignments, to calculate the CO₂ emissions at consignment level and then to compensate for them via various projects.

Who is behind your company?

The founders of Shipsta had previously worked together for the logistics company Kühne + Nagel for many years. Together they decided to give freight purchasing a general overhaul.

Oncap



Anthony Wandt, Managing Director

Who is behind your company?

Oncap is a spin-off of Wandt Spedition Transportberatung GmbH that works together with various partners: The team consists of logistics and software development experts - from rookies to old hands.

What can your product do?

Our software enables logistics to visually and procedurally document their interfaces and transfers of risk to their carriers. Paper checklists are replaced by digital proof plans and photo proofs in real time.

What is the business model behind this?

Oncap is a SaaS solution that bundles logistical sub-processes in one application, creating immediate economies of scale. Our business model is sustainable and incremental, so it is developed step by step. It is a practical solution with which we help companies achieve noticeable savings potential, along their supply chain through process optimisation.

Who is the target group?

Shippers and logistics companies along the entire supply chain. They use Oncap to fulfil their verification obligations and make their daily operations more productive. The logistical processes in the interface with carriers are simplified and improved.

Why do you have what it takes to develop?

The team consists of practitioners: they understand the everyday problems in logistics - and not from a reference book, but from personal experience. Our software solves exactly the challenges involved.

PHOTOS: IMPARGO, LOGISTICS CLOUD, SHIPSTA, STEFAN BUNGERT

Facts instead of gut feeling

How can digitalisation and automation make more efficiency and sustainability possible across all means of transport? Simon Richenhagen, Head of Marketing at the Krone Commercial Vehicle Group, talked about this with Moritz Röder from **Lufthansa Industry Solutions** (LHIND) during a visit to the Technik-Museum Speyer.

"Data only becomes gold when we are actually able to exchange it with each other and work with it."

Moritz Röder



Simon Richenhagen: Transparency is becoming increasingly relevant in logistics. At Krone, we support the transport industry with digital tools in and around the trailer. As an IT service provider, your company advises customers who use a wide variety of transport modes. What role does transparency play for your customers, Mr Röder?

Moritz Röder: It has a very high priority: everyone wants transparency - ideally always along the entire supply chain. People want to know what happens on the road, on the rail, on the water and in the air. But so far, no one has really managed to implement this across the various transport routes. You certainly know this when you have goods coming in and at the same time your customers want to know when they will get their trailer. As a Lufthansa subsidiary, we have traditionally had strong ties to air transport. I believe that we are already quite well positioned there, because a lot of data is very well available. On websites such as Flightradar24, anyone can look up the location of a particular plane. Our sister, Lufthansa Cargo, for example, has its own e-tracking platform on which you can see where your goods are in real time, based on the air waybill. Such approaches are also interesting for other industries outside of aviation. But in my opinion, we should go one step further: We need to make such data available across the different modes of transport on one platform. There are providers who have specialised in this and have been working on it for years. But full transparency throughout the entire transport chain does not yet exist.

Richenhagen: *We have been offering telematics services for a very long time and can provide ETA data through a cooperation with Shippeo, for example, but I agree with you: we need overarching transparency. I would like to see the industry grow even closer together and perhaps also develop a kind of global language format - to enable the transparency that makes our customers' work easier. I think we should establish a different way of dealing with data: Companies should share it more actively so that customers can benefit from it. At Krone we are already doing that, because we believe that*

the customer should not have to use different portals from several manufacturers in parallel.

Röder: I think we all know our own data as a company quite well by now. At Lufthansa, for example, it is known at all times where every plane is located. There are similar examples from other industries, especially in logistics. What is important now is that we share this data with each other and do not see it as a pot of gold that we sit on and guard like a treasure. Because data only becomes gold when we are actually able to exchange it with each other and work with it. Especially since I don't always need to know where my consignment is at given time, but only want to be informed if something has changed in its condition or if the ETA has changed - in other words, if I have to take action. This is where the automation of processes comes in: data should no longer have to be processed manually, but should be made available automatically.

Richenhagen: *Krone has been manufacturing trailers for about five decades. When telematics technology developed, we integrated it into the vehicle. In the case of aircraft, transparency was probably thought of more technologically from the very beginning, wasn't it?*

Röder: A lot has happened there in recent years, too. In order to evaluate large amounts of data and make it available, you need technologies such as the cloud, artificial intelligence, Big Data and platforms that are able to store and retrieve the data. These technologies have only recently developed or reached the necessary strength - or have become affordable enough to be brought to the masses. In the aviation context, this means that it is now possible to map a comprehensive digital twin for modern aircraft. This produces terabytes of data that also have to be processed again. In cooperation with us, Lufthansa Technik has developed its own product called AVIATAR. Here, too, it is interesting to see how the data is used. An important application, for example, is predictive maintenance: Using the digital twin, it is possible to reliably predict when the aircraft will need maintenance the next time. →



For example, mechanics traditionally replace all spark plugs at regular intervals. The digital twin, on the other hand, can show how often each one has fired and accordingly, it can be replaced individually - namely when it really needs to be changed. This saves resources and promotes sustainability.

Richenhagen: Predictive maintenance is also a big issue for us, because nothing is more important than keeping the trailer rolling. The failure of a vehicle can cause great damage, especially if it is loaded with refrigerated goods. We are therefore working on a solution that can anticipate a possible failure and give an appropriate warning. Tyre pressure can also be monitored, for example, Tire Pressure Monitoring protects against damage, breakdowns and accidents. The aim of all this is to enable customers to use our products with as little worry as possible and to this end, we support them in working more efficiently, both economically and ecologically. On the road, this is exactly what digitalisation provides. Is it similar in air transport?

Röder: Definitely. If, for example, I can already coordinate my processes according to when cargo arrives and what condition it is in, I can plan much more efficiently and also react immediately if required.

Richenhagen: What about loading processes, will they also be digitalised and automated for air freight? This is a big topic for us at the moment. We have developed the eTrailer with an electrically driven axle, which can even relieve the tractor and save fuel. At the same time, we are launching a container chassis that automatically adjusts to the right size of container at the push of a button. Are there similar technologies in air freight?

Röder: Well, air freight is very diverse: on the one hand, there are the standardised means of loading, such as air freight containers, which can be loaded relatively automatically. But there is also a lot of individual freight that has to be cleared through customs, and that makes automation difficult again. In addition, a major challenge for cargo airlines is that customers do not always really deliver what they have reported in advance in terms of the dimensions and weight of their goods.

Richenhagen: Just as passengers sometimes wonder whether they might get on board with their slightly larger hand luggage?

Röder: Exactly! We use digital solutions to identify as far in advance as possible where we need to check volumes more closely. So, automation is definitely an important goal in aviation, and at the same time it is not easy to achieve because of the complexity of the business. Another issue that is of course affecting

„I think a different way of dealing with data should be established: Companies should share it more actively so that customers can benefit from it.“

SIMON RICHENHAGEN



everything at the moment is the bottlenecks that exist in terms of personnel, raw materials or even in the supply chains. Does this present particularly big challenges for you in the manufacturing industry?

Richenhagen: Definitely. As a manufacturer, we are strongly affected by the shocks in the supply chains because raw materials and materials are difficult to obtain and prices have risen enormously. This also affects our customers: More and more freight is being shifted to the road. At the same time, and above all, there is a lack of personnel.

Röder: We ourselves are feeling it too, but our customers even more so. Ports around the world are congested, there are restrictions due to the Corona pandemic, as well as strikes - recently in aviation, but of course also in the ports themselves. All this slows down the flow of goods. At the same time, there is a lot of freight and thus many containers that have to be stored temporarily. For a long time, there was no capacity in the aircraft to transfer such transport: As a rule, passenger planes also take cargo. This so-called 'belly transport' fell away for the most part during the pandemic, and the cargo planes were correspondingly burdened.

Richenhagen: In the face of so many challenges what advice do you have for your clients on how to re-establish a certain predictability?

Röder: It is important to realise that you are still capable of acting. In doing so, one should by no means let oneself be guided by a gut feeling, but instead, by facts - and also to develop and strengthen one's own trust in technology. That takes time. At the same time, a high degree of flexibility is required today: even if I have set up a medium- and long-term plan based on data, I have to be able to change it at short notice. The ideal situation is when algorithms make suggestions, perhaps supported by artificial intelligence, and I trust these suggestions because I can be sure that the technology works reliably.

Richenhagen: At Krone we see ourselves not only as a pure vehicle manufacturer, but also as a mobility consultant for our customers. We want to offer them the best solution for their transport task in each case. This is made possible above all by the data that our telematics can reveal, combined with the expertise and experience within the company. In doing so, it is very important that we live and breathe networking and are aware of how important it is to open up to the outside world.



Röder: We also follow this approach. We advise in an open-minded way and have to be well-informed about everything that is technically possible at the moment and network with startups, among others, in order to know their solutions. You don't have to and can't reinvent everything, but you should collaborate to exploit the greatest possible potential.

Richenhagen: What about sustainability, where does your company stand and what is the situation in the IT sector?

Röder: Sustainability is also a key issue for us at LHIND. That is why social responsibility is also part of our strategy. The United Nations has defined 17 goals for sustainable development, seven of which we are pursuing with particular focus, just like the Lufthansa Group. This is not only about ecological aspects, but also about economic and social aspects, which also include topics such as diversity and education. With regard to our contribution to combating climate change, we support the goal of limiting global warming to 1.5 degrees. For us, this also means continuously recording and reducing our corporate carbon footprint. We are therefore currently examining how we can make our IT in particular, more sustainable through green coding or more efficient architectures, for example, in order to handle data volumes more sparingly and thus conserve precious energy resources. Of course, efficient IT and resource-saving code are just as interesting for our customers. That is why we support them in this area on their way to more sustainability. We can also use modern technologies, such as artificial intelligence, to make routes or processes more efficient. Partnerships also offer us the opportunity to contribute to society. For example, in cooperation with the initiative SPRK, we are taking a global stand against food waste, by offering companies a tool for measuring their sustainability KPIs, together with the Lufthansa CleanTechHub. Also, together with SetLog, enabling easy-to-implement and reliable compliance with the Supply Chain →

+ ABOUT THE PERSON

Moritz Röder, Associate Director Supply Chain Management at Lufthansa Industry Solutions AS GmbH, studied economics and international business in Germany and South Africa. After completing a master's degree with a focus on supply chain management and customer relationship management, he began his career at the London-based accounting and auditing firm EY before joining Lufthansa Industry Solutions in 2018. The airline's consulting firm, which focuses on IT consulting and systems integration, supports not only the Lufthansa Group but also numerous external customers such as DB Schenker, VW and Hamburg Süd in their digitalisation processes.



Sourcing Obligations Act, coming in 2023. The last example in particular can have a significant impact on making supply chains more flexible - and the past few years have shown how important this flexibility is in a globalised world. Last but not least, it became clear during this time how much aviation contributes to globalisation and, in particular, to international understanding. Thanks to aviation, we are in a position to personally exchange information across continents from person to person. But being in conversation with other cultures broadens horizons - and that makes a society more valuable.

Richenhagen: *This holistic approach is important, no question about it - both within a company itself and on a global level. To do this, you have to be open to new impulses and talk to others. Fortunately, such personal meetings are more possible again.*

Röder: Yes, events like the IAA Transportation are immensely important for this. There you can look left and right and break down silos. Personally, I am still concerned that we not only present successes in such discussions, but also can honestly communicate what is perhaps not going well. After all, innovations have often been born from mistakes.

Richenhagen: *Absolutely right. Where would you say traffic on the road and traffic in the air can still learn from each other?*

Röder: In my opinion, you can no longer separate the two. Intermodality means that we exchange data. And I think both areas can do that even more.

Richenhagen: *I see it the same way, the means of transport all interlock and complement each other. Our joint task in logistics is to close gaps to enable a seamless transition and thus also make the entire supply chain more sustainable.*

Röder: For all of this, however, even stronger support is needed from politics. It is good and right that, for example, social sustainability is to be strengthened with the Supply Chain Due Diligence Act. But even if it enters into force on 1 January 2023, there are still no precise definitions a few months beforehand of what evidence is required and in what form. As important as data protection is - GDPR needs an urgent revision that also includes the opportunities and potential of new technologies which have a stronger practical relevance.

Richenhagen: *We also experience this when we sometimes have to go a long way for new developments via exemptions, for example with aerodynamic components on the trailer, which are not viable due to length restrictions.*

Röder: Germany definitely has to become more flexible in this respect in order not to be left behind internationally. At the same time, it has to be said: as a first mover, you usually always come up against obstacles. If you want to be at the forefront and be innovative, you usually run into blockades.

Richenhagen: *That's right. It just shouldn't end up that innovative ideas regarding the economy are virtually punished by politics.*

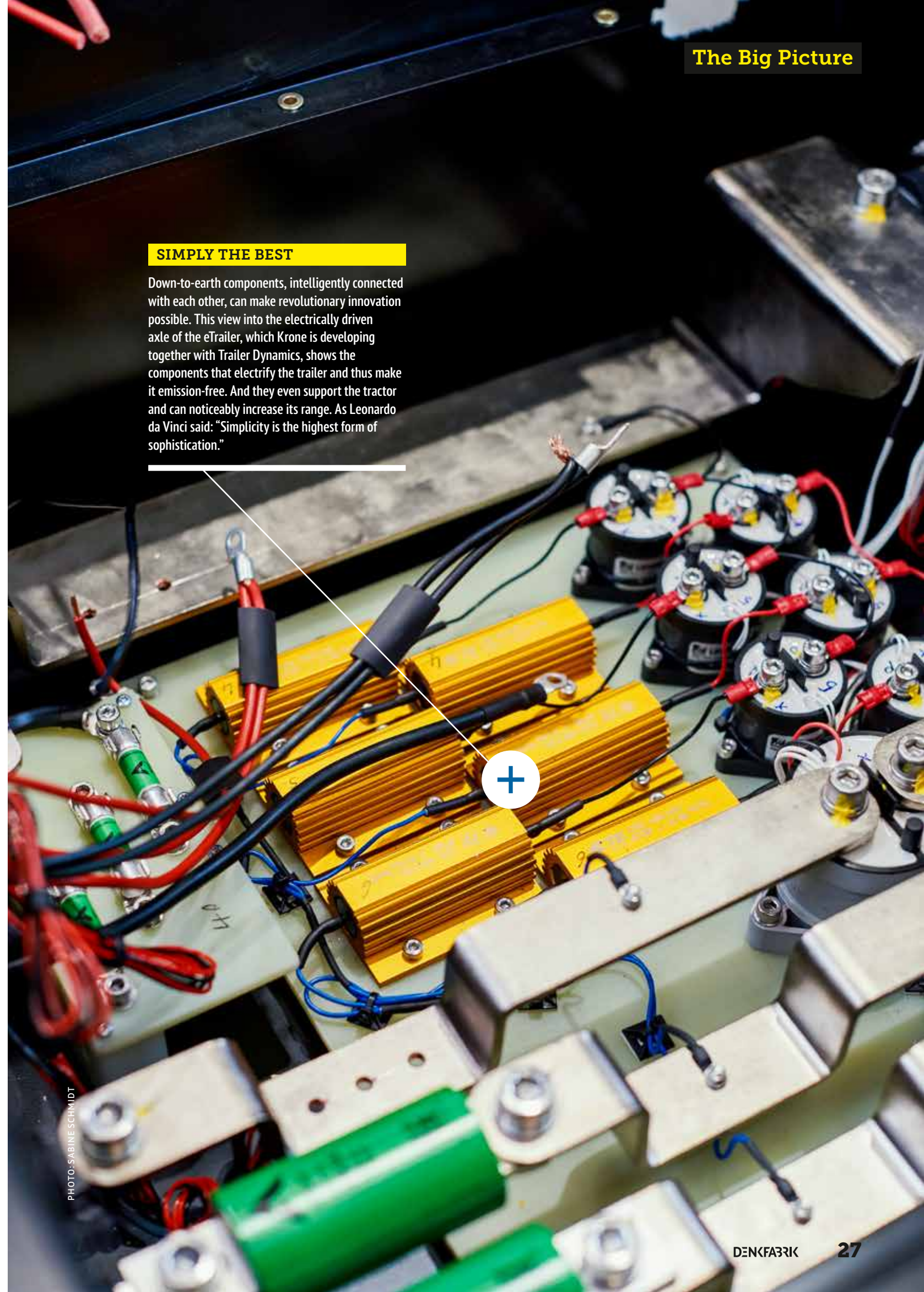
Röder: Yes, that can become an innovation killer. ↩



PHOTOS: GERALD SCHILLING FOTODESIGN

SIMPLY THE BEST

Down-to-earth components, intelligently connected with each other, can make revolutionary innovation possible. This view into the electrically driven axle of the eTrailer, which Krone is developing together with Trailer Dynamics, shows the components that electrify the trailer and thus make it emission-free. And they even support the tractor and can noticeably increase its range. As Leonardo da Vinci said: "Simplicity is the highest form of sophistication."



“We need to take advantage of everything that technology can provide”

The situation in the ports is getting worse and worse: entrepreneurs like Axel Plaß, Managing Director of the **Zippel Group**, report unprecedented bottlenecks. With the PE TU50 Box Liner, Krone presents a technical solution that can help ease the situation.

Queues at international ports have been reported for months: Container ships are jammed for kilometres, goods are stuck, organisational processes come to a standstill again and again. For freight forwarders like Axel Plaß, Managing Director of the Zippel Group in Hamburg, which specialises in combined transport, this means constant replanning, rescheduling and rethinking. The situation at the ports is worse than ever, the entrepreneur explains: “I’ve been in the business for 32 years and the situation has never been so out of control. We are really facing huge problems.” He expects the pressure on supply chains hardly to ease in the next year or two either. “There are permanent structural problems behind this that we are carrying around. We have to be prepared that they cannot be solved in the short term.”

Fully automatic chassis

Technological solutions can nevertheless provide the answer. Krone is presenting the Box Liner PE TU50 at the IAA, a new, multifunctional chassis that adjusts fully automatically to the different container sizes. Drivers can operate it at the push of a button and don’t even have to get out of the tractor. Axel Plaß took a look at the pilot model at the Port of Hamburg. It is important to him to know about innovations in the industry and to test them for their practicality. And he sees the chassis not only as a way to save time when loading at the port, but above all as a step towards making the driver’s profession more attractive. “We are dependent not only in the commercial area, but especially among the drivers, and on finding people who still enjoy their job,” says the forwarder.



Especially for transport to the ports, drivers have a lot to do. “If you have to get out of the cab to lock the container by hand and manually adjust the chassis, put on gloves for that and maybe reach for a hammer, then that’s a few more work steps again. As a driver today, you think three times about whether you do that - or whether you’d rather drive swap bodies for the CEP service providers. We have to relieve these people as much as possible of the pressures that surround them.”

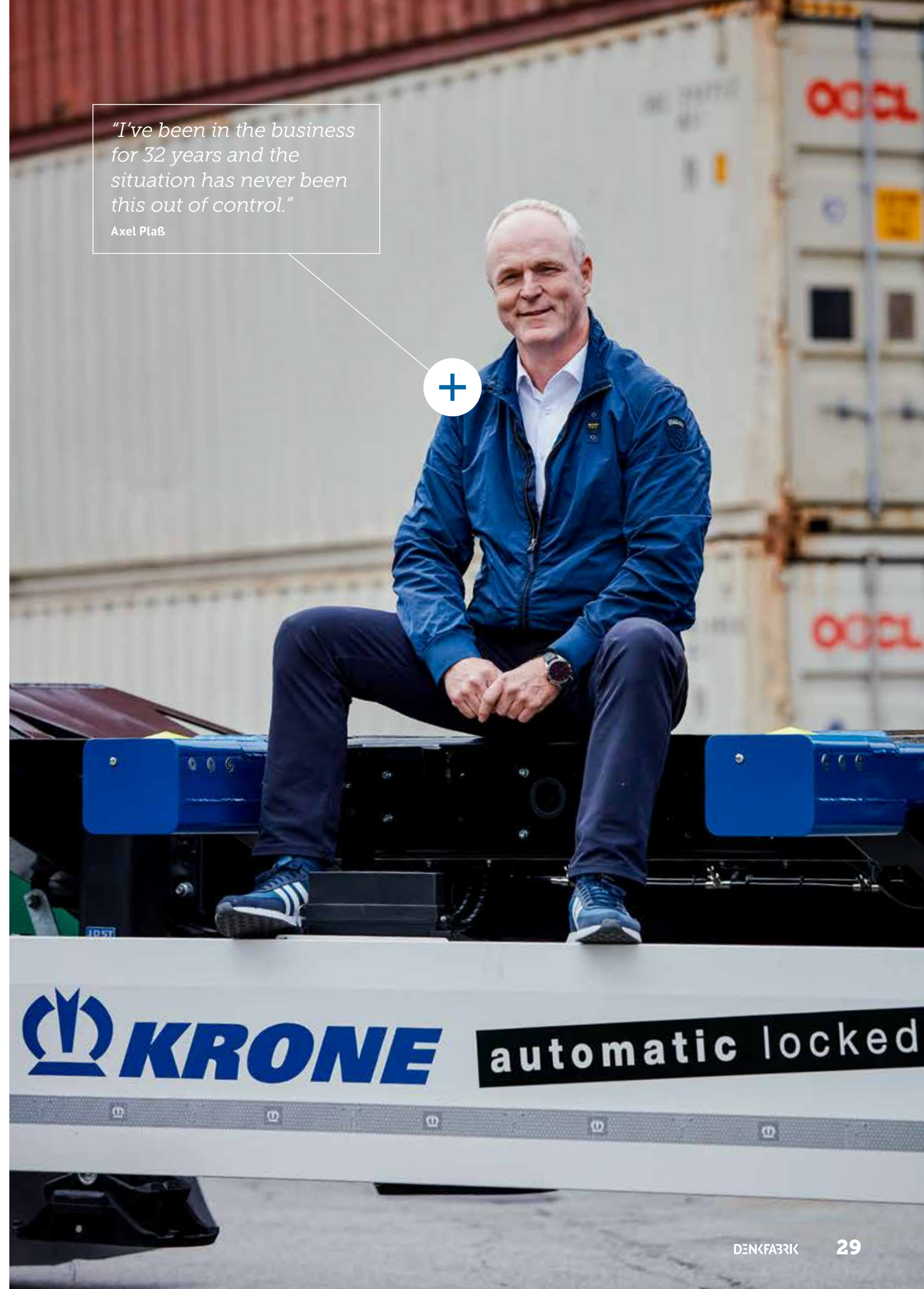
Manual adjustment takes time and space

At the terminal, too, manually adjusting a chassis not only costs time, but also the vehicle needs a parking space. “This is an organisational challenge: the terminals need extra lanes so that this process can be handled on site,” says Plaß. “It would be a lot easier in the future, using automatic chassis to minimise the turnaround time.” The high pressure on the ports also manifests itself in increasingly tightly timed journeys, the expert explains: →

The fully automatic chassis makes loading with containers more safely, more efficient and much easier for the drivers.

“I’ve been in the business for 32 years and the situation has never been this out of control.”

Axel Plaß





So far, there is only one model of the Box Liner PE TU50, but series production could start soon. Axel Plaß has already tested its functionality at the port of Hamburg.

“Every minute I can save there helps. After all, we still have to cover one or two kilometres in long-distance traffic. In this respect, innovative handling systems enable us to travel up to ten kilometres further at the end of the day. It’s a lot of little things that add up to be of great.”

For Plaß, automation and digitalisation are therefore a must: “We have to use everything that technology can provide. “Because we will not be able to meet the challenges with personnel. “We have to keep the people who are now working in these jobs. The driving profession must remain attractive for them, otherwise they will turn their backs on the industry. We have no other choice than to push ahead with automation and digitalisation, thus making drivers’ lives easier and the disjointed logistics chains more or less manageable again. “

Ships come later - or not at all

Plaß reports from his daily practice: “It can well happen that we drive to Hamburg with a truck, and then it becomes clear that the ship for which we want to deliver does not arrive at the port as announced. Maybe it arrives in a week, in 14 days or not at all - anything is possible.” Delivered containers are waiting to be loaded and need storage space. It also happened to Plaß that the Westhafen rail access in Berlin was blocked when ground sills were checked since July: 1,000 Zippel containers stood there. Not only was the organisational effort to collect them with trucks a challenge, but also there was another crucial catch: with the railway, containers may be delivered five to seven days before the departure of a ship, with a truck only 24 or perhaps twelve hours are available.

“At the moment, we are not able to provide data in these transport chains in such a way that we can plan with it,” explains Axel Plaß. “I can track all the ships on my mobile phone, but so far we don’t get the corresponding data

in the transport chain in such a way that we can use it meaningfully. We still have one foot in the Middle Ages, while at the same time we are thinking in terms of the future. Any opportunity to make transport cheaper or avoid journeys altogether is valuable.” He sees the multiple problems as a serious threat to the German economy: “We are currently running into the wall with a head start. And I don’t think it will be the case that the economy here - as after the lockdowns in the wake of the pandemic - can shake itself once and go on, but rather we will be down for longer. Germany and the whole of Europe will become less and less attractive as a production and business location.” It is already happening that customers are switching to Greece, for example - there the logistics process costs a few hundred euros more, but you can be sure that everything will run smoothly.

Many problems due to lack of automation

Technical solutions like Krone’s automatic chassis can point the way. “After all, I’m still sitting in a company that employs 200 people, I can’t and don’t want to close that down tomorrow,” says Plaß. “We have to face the challenges. That makes support through technological means all the more important. A large part of the current problems is caused by lack of automation and digitalisation. If someone sits somewhere, evaluating faxes and typing emails, mistakes happen. That has to change.” He would like to see more transparency from the ports and for them to enter into dialogue with all stakeholders. According to Plaß, ports currently still focus too much on the water side, because that is where their customers are, who pay for handling and storage. They are also (and quite rightly) the first point of contact for the terminals. “On the other hand, all this can only run smoothly if the outflow and inflow of containers are also well organised on the land side. Solutions like the Krone chassis can make a big contribution to this.”



PHOTOS: MARCO GRUNDT

Fully automatic container preparation

With the **PE TU 50 multifunctional chassis**, Krone is developing an innovative product that can optimise process times in the terminal or depot, and save a lot of time when handling containerised cargo.

Prepare a chassis for a new container size in less than a minute: The first fully automatic multifunctional Box Liner TU 50 Traction Automatic from Krone makes this possible. At the touch of a button, the chassis switches autonomously to the desired configuration. For example, if it had just been carrying a 20-foot container flush with the rear and placed in the middle, it can now perfectly accommodate a 40-footer. Thanks to a remote control, the driver can even remain seated in the truck, incorrect settings are avoided and driver errors, such as an incorrect lift in the terminal, are ruled out. The system increases safety and makes everything much easier. Above all, it speeds up the process of changing containers. “When it comes to turnover at the port, we believe effectiveness can be increased by about ten percent,” explains Product Manager Ulrich Josefowitsch. “This means that five trucks equipped with the automated Box Liner can replace six articulated trucks.”

Small-batch series as early as 2023, full production as of 2024

The base consists of a gooseneck chassis, which nevertheless allows transport in countries with a height limit of four metres. In the case of the multifunctional Box Liner, the classic twist locks, which are normally used to mechanically adjust the chassis, have been replaced by sensors, robust



pneumatic cylinders and an automated locking mechanism. A smooth-running air motor drives the rear extension. Once the process is complete, a control lamp and the brake release confirm that the container has locked correctly after being put in place. The concept was implemented with specially developed components from Aucos, an expert in reliable automated container locking systems and fifth-wheel couplings as well as electronic and pneumatic control technology. Krone is presenting the chassis at the IAA and plans to launch a small-batch series in 2023; series production is scheduled to start in 2024.

Given the unfortunate waiting times in ports, drivers currently have a lot of time to adjust the chassis so that it fits. “But that will change in the future,” says Josefowitsch. “There are already terminals in Rotterdam where pre-registered vehicles are processed at high speed.” What’s more, many terminals are due to be rebuilt in the near future to accommodate increasingly large ships, some of which can hold up to 20,000 containers. “These also have to be unloaded, set down and transported quickly. In the future,

processes in the ports will accordingly require an even higher level of professionalism. Our chassis can help support this development.”

Controlling autonomous vehicles remotely

In depots, there is already the challenge of processing everything as fast as possible. “There, the container is sometimes already practically hanging on the reach stacker as soon as the driver pulls onto the site. This is where the fully automatic TU 50 traction automatic chassis can show what it’s really capable of,” explains the product manager. He is also thinking how it could be used in autonomous driving: Placement of the container could then be automatically controlled remotely from the terminal. The chassis is particularly interesting for all contractors who drive port transfer and shuttle routes. “All those with a high turnover rate will reap the benefits,” says Josefowitsch. “They can then change their transport goods more quickly and, if necessary, also save space because the vehicles are no longer sat around waiting: So, the chassis can continue on its way in no time.”





On the way to the electric refrigerated trailer

Celsineo, the modular refrigeration unit from Krone and Liebherr, will also be able to operate emission-free in the future: Krone, Trailer Dynamics and Liebherr are working on the integration of the electrically driven axle, the Battery Pack and the purely electrically driven Celsineo refrigeration unit. Liebherr systems engineer **Anton Tonchev** has been involved in this integration from the very beginning.

With Celsineo, Krone and Liebherr have revolutionised the refrigerated trailer - now they are taking the next step and want to combine the modular cooling system with an electrified trailer from Trailer Dynamics and Krone to make the overall system more climate-friendly and even more efficient. "The battery capacity installed in the eTrailer can supply all the power-consuming components that are installed on the trailer or, in some cases, in the vehicle," explains Anton Tonchev, systems engineer in the commercial vehicles division at Liebherr-Transportation Systems. "In addition to supplying the cooling unit, the energy carried

in the battery is also used to support the tractor's power. This saves between 20 and 40 per cent fuel."

Relieving the strain on the overall system

The combined team of the three companies consider the truck, the trailer and the refrigeration unit as a complete system. Tonchev explains: "I can regulate the operating status of the refrigeration unit so that the refrigeration unit uses the available energy resources in an optimised way. The 30 percent increase in the efficiency of the cooling unit →

+ ANTON TONCHEV

Dr Anton Tonchev has been responsible for Electric Systems in the Commercial Vehicles Division at Liebherr in Vienna since July 2021. The mechatronics engineer with a doctorate has worked, among other things, as a scientific project staff member at the Graz University of Technology and for the companies AVL List, REFU Elektronik and TUV Austria. From 2014 to 2019, he was responsible for Powertrain, an Electrical Network at Liebherr.

Liebherr and Krone make refrigerated trailers more reliable, flexible and efficient with Celsineo. Now the modular concept is being further developed into a cooling system with an electrically driven axle.



is not the end of the story. If we also include weather and climate data, this could enable greater efficiency. Depending on whether it is cold or warm on a long trip, I could adjust the control strategy of the refrigeration unit accordingly. That offers a lot of potential for an even greater reduction in energy consumption.”

Anton Tonchev has been involved in the Celsineo activities since the beginning. “Being able to participate in the development of such a product from scratch is a special experience,” he explains. “We started from scratch, and that offered a great chance for all of us to contribute our full creativity.” Celsineo is a unique modular refrigeration system for semi-trailers that has already become a real success since it went on sale in 2021. The system combines three refrigeration modules, each of which has a self-sufficient and hermetic refrigeration circuit, can be controlled individually and offers the necessary power as required with high efficiency. With the integration of an electric drive train, especially the traction battery with a capacity of up to 600 kWh, the vision of an emission-free refrigerated trailer is now becoming a reality. An uptime of 36 hours without emissions is quite possible. Another advantage can be seen in the acoustics: “The diesel or generator drive behind the cab is no longer noticeable to the driver - because it simply no longer exists. So, the driver can relax much better during his breaks”, says Tonchev.

Supply to the refrigeration unit has priority

The specialists from Krone, Trailer Dynamics and Liebherr worked closely together in the development and continuation of the system: “You can’t just connect this solution to the

eTrailer, all sides have to link up well,” explains Tonchev. Among other things, there was the technical challenge of adapting the existing system so that it could still be integrated into the electrical systems of the eTrailer via plug-and-play. And the systems’ power supply had to be matched to each other, to enable a long service life. “We worked together for a long time to optimise the interfaces.” Powering the cooling unit from the battery it carries and the recuperation-capable drive train is a priority to protect the sensitive goods on board. A major fascination for Tonchev is the fact that the eTrailer offers enough energy for its own powertrain as well as for the support of the tractor unit. He himself has also worked a lot in the past on the development and technology of battery systems. “This now helps me understand very well how the systems can work together.” Tonchev studied mechatronics in Vienna and earned his doctorate in Graz. He started his career as a software developer, worked on a scientific project at TU Graz on a wheel suspension and brake test bench and developed a highly dynamic battery, vehicle and powertrain simulation of hybrid vehicles before joining Liebherr in 2010. The new cooling unit project was launched there in 2014. The team had to break new ground in many respects: “At first we thought it couldn’t work. But then you move forward step by step and realise that it does work. We were able to secure a lot through simulations and many validation tests, among other things.”

Batteries will become even smaller

Parallel to this, the technological possibilities have developed significantly: “In the past, many players in transport and logistics agreed that a battery drive would not be profitable for commercial vehicles because it was too expensive. In the meantime, much more has become possible.” Tonchev also observes the progress in other drive alternatives such as fuel cells: “From which source the electricity which comes in the future is secondary for the Celsineo refrigeration unit, if the interfaces are properly coordinated.” The weight of the battery storage unit remains a major challenge: “Here, too, we are far from the end of the road - in the future we will certainly be able to minimise the dimensions and weight of the battery.” Over the years with Celsineo and during the close cooperation with Krone, Anton Tonchev has gained a lot of valuable experience: “No one can take that away from you, and it is also a solid basis for further projects. We now know what works really well. With every step we take together, our expertise, knowledge and strength grow.”

PHOTOS: LIEBHERR



A column by Bernard Krone

Building on our strengths



Climate change predictions are clear: our planet needs help! The entire global community must commit to greater sustainability. In transport, we see clearly that sustainability does not need just one ingredient, but a whole range of concepts, ideas and technical solutions. At the same time, the wind is blowing noticeably stronger - price pressure, shortages of skilled workers and raw materials are making it harder for all players in the industry to do their jobs.

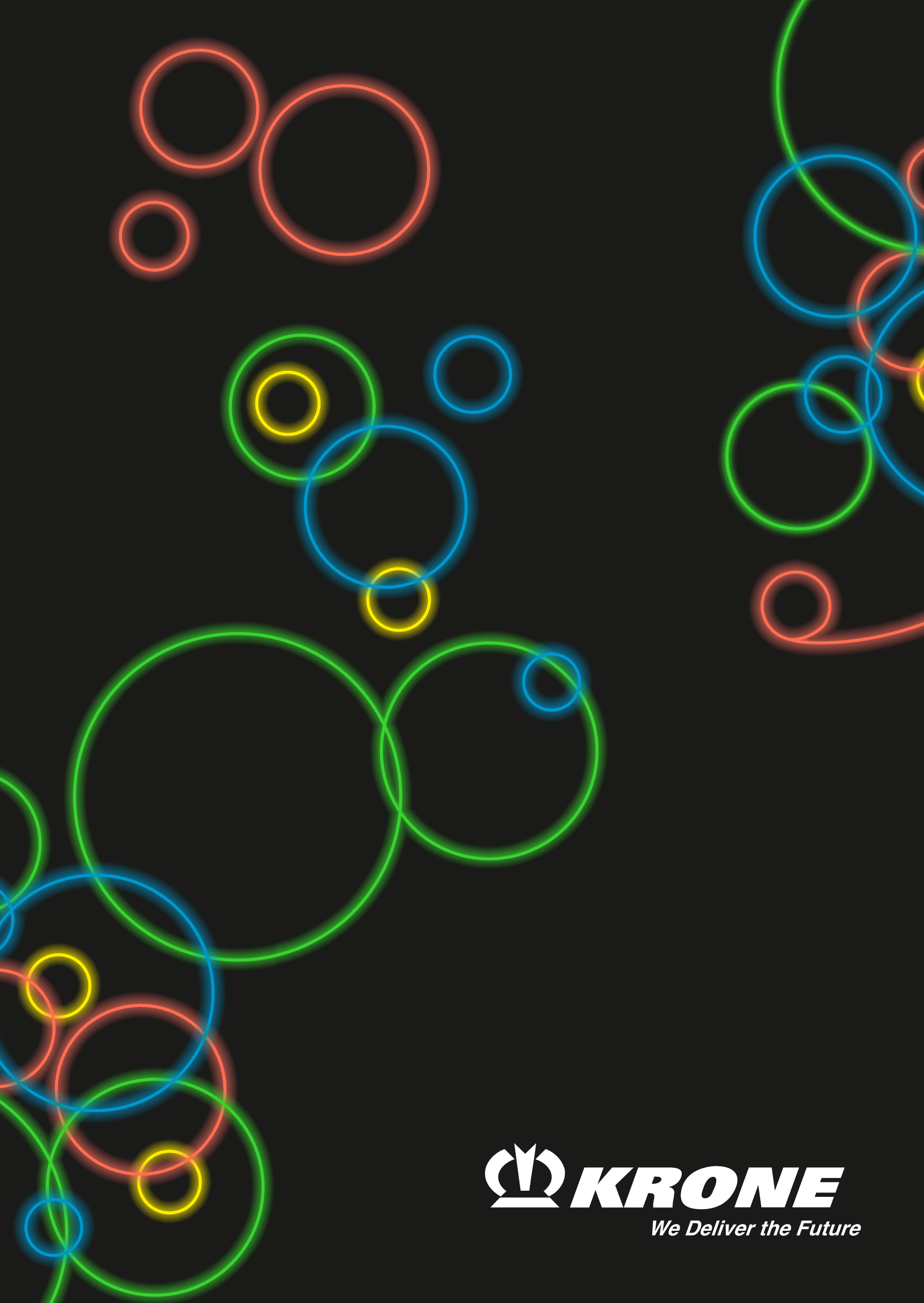
These challenges cannot and should not be met alone. Now it is more important than ever to network with strong partners, exchange knowledge, strengthen each other and thereby create even more possibilities together. In dialogue with others, you can share solutions, and learn from each other’s experiences. Discussing thoughts and hearing from others how they have overcome difficulties can open up new paths. Uncertainties have to be overcome, in

every respect. The exchange of ideas and good communication always help.

Discussing thoughts and listening to others can open up new paths.

Looking optimistically into the future requires a lot of confidence in these times. We know this not least from the many conversations we have with our customers. But we all must not forget how much strength we have already demonstrated in the past, how many hurdles we have already successfully overcome. We should continue to build on this strength, and on our experience. No one person creates the future alone - we all create it together.

PHOTOS: ISTOCK / GEORGE PETERS, KRONE



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