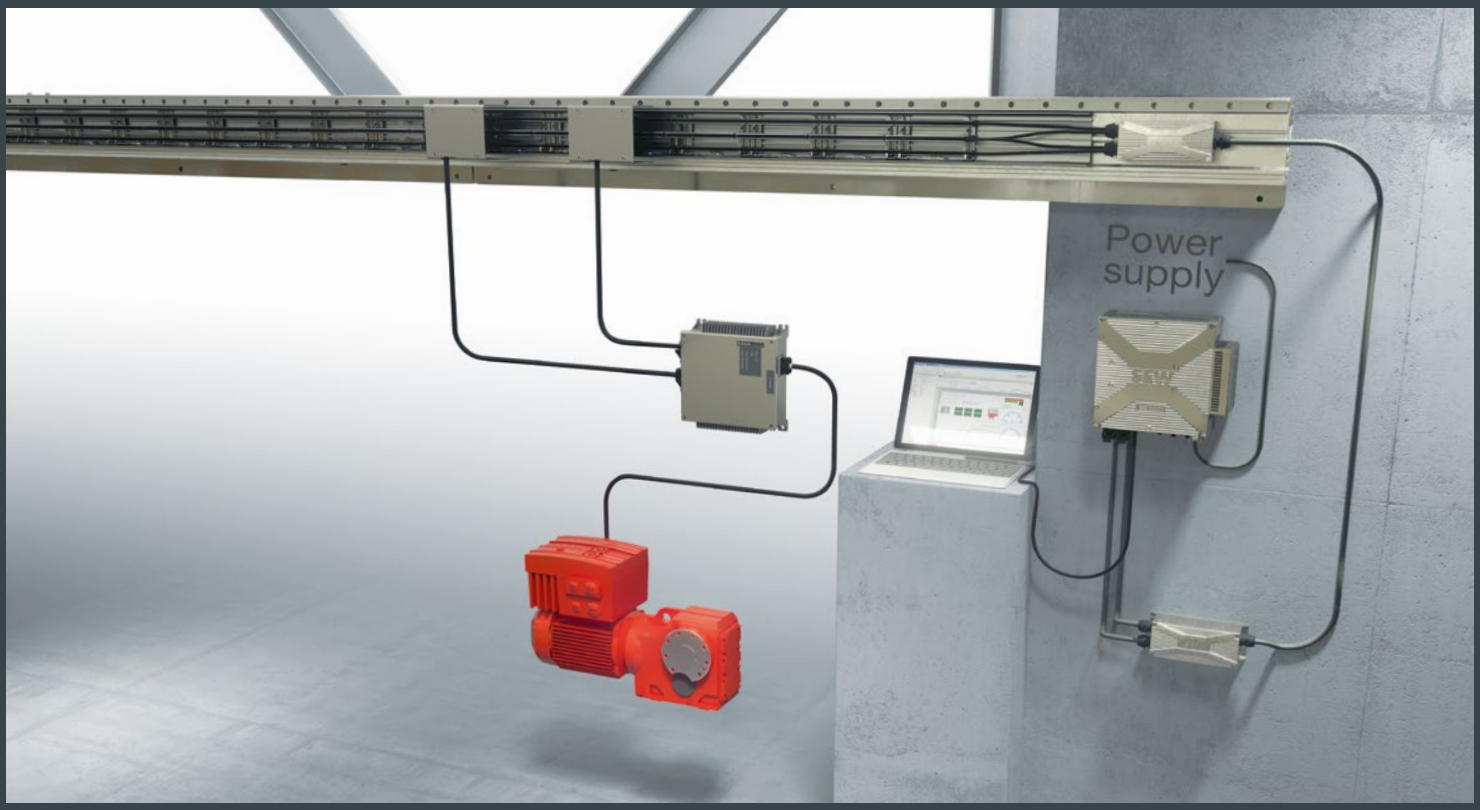
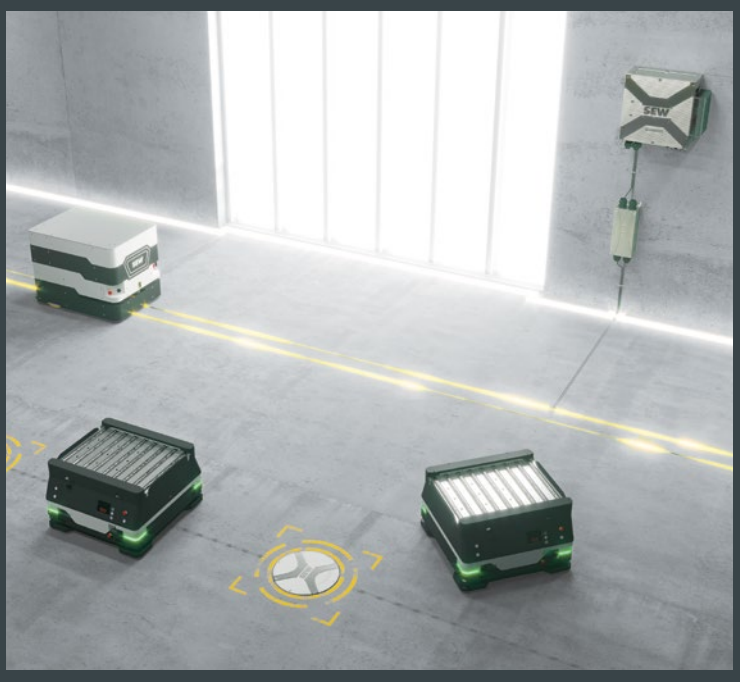
SEW EURODRIVE

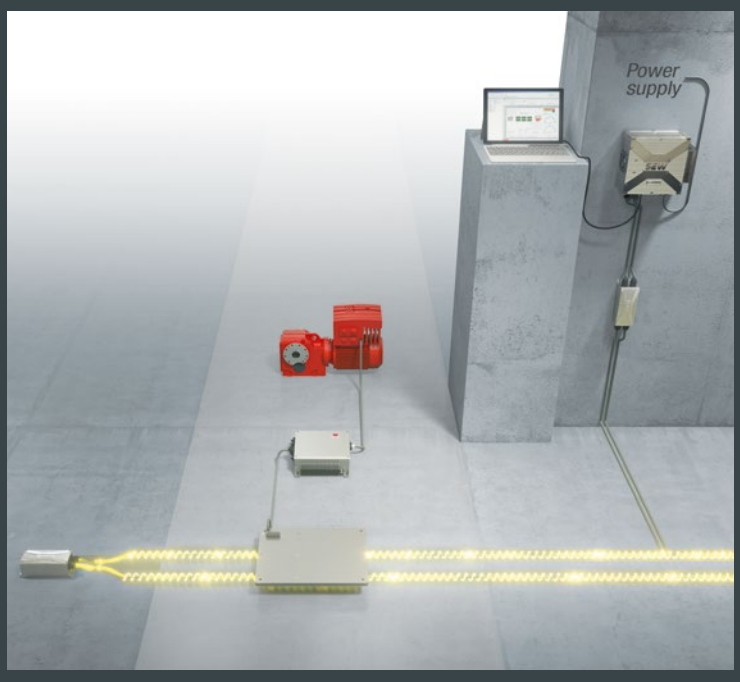
MOVITRANS®

Contactless energy transfer system

Interview 3: Energy-autonomous factories and energy-autonomous homes







Designed for simplicity and optimized installation

MOVITRANS® contactless energy transfer system makes production facilities modular and flexible

Everyone is familiar with those electric toothbrushes that sit in their stands and charge wirelessly, just like magic. Smartphones can also be charged using suitable contactless charging points.

This technology has rapidly become a standard fixture in the latest generation of cars and even mobile homes. Simply place your cell phone in the tray and not only will the battery charge, but the mobile device will also become integrated into the vehicle electronics – all without the owner needing to find the correct cable or socket.

Contactless energy transfer has long been part of industry, too, and is one of the cornerstones of cutting-edge production. MOVITRANS® is a key element that supplements the comprehensive portfolio of Bruchsal-based drive and automation specialists SEW-EURODRIVE. For more than two decades, the company has been one of the most important leading suppliers of this technology for industrial use.

In an interview, Managing Director Mechatronics Innovation at SEW-EURODRIVE, Dr. Hans Krattenmacher, reveals the secret behind the MOVITRANS® success story and how that story will develop in the future.

Dr. Hans Krattenmacher,
Managing Director Mechatronics Innovation,

has been with SEW-EURODRIVE for over 20 years. Right from the start of his time with the company, he came into contact with the MOVITRANS® contactless energy transfer system – which was still in its infancy at the time.

He experienced up close and personal how this "very, very new technology" at the time began to take off and ultimately scored its initial success in the field.

What are the fields of application for which MOVITRANS® might be used?

And how is awareness of SEW-EURODRIVE being raised in these areas?

Even in fields that do not traditionally belong to SEW-EURODRIVE's target market, MOVITRANS® offers interesting approaches and a whole range of advantages. In amusement parks, for example, where lots of attractions have to be moved. Particularly in places such as this, the last thing you want is to have to trail a cable behind you.

With MOVITRANS®, you don't need any conductor rails or trailing cables – after all, these take up space and are very maintenance-intensive. We have some great projects running in this field, outside conventional industrial automation. **For example, there is a little train that is supplied with energy using MOVITRANS® spot and takes park visitors from A to B without emissions.** Although these are not typical applications for our system, they do show once again the kinds of opportunities MOVITRANS® offers and opens up.

A few years ago, for instance, we tried to get a foot in the door for MOVITRANS® in automobiles themselves and electric mobility. However, we discovered that fulfilling the strict standards set down by automakers in Europe requires an extremely high level of complex outlay that we were not prepared to pursue. The idea itself is still on our radar, however. We are currently working on a new version of this subject on our Chinese market, where we have been able to show excellent approaches in interesting projects. Even in such seemingly exotic projects as rail technology, we can see potential applications for MOVITRANS®. This includes transrapid technology, which has been sold to China. That gives some indication of how diverse our concept is.

SEW-EURODRIVE offers a comprehensive, well thought-out system that has a wide range of applications far beyond purely industrial automation.

What makes MOVITRANS® so special in this regard?

The conventional energy infrastructure we know so well has been around for over 100 years. Now we need the new infrastructure to be just as simple to control.

This means that we have systematically designed our MOVITRANS® system for simplicity – in both installation and startup. By developing our solution to be just as convenient to operate as conventional installations, we can counteract misgivings and reservations. Many classic applications such as sorters, where you would previously accept maintenance intervals and plan for them, now run 24/7. That does not leave any time for a maintenance interval, because downtime leads to a loss of sales. This is where MOVITRANS® comes up trumps with its wear-free properties.

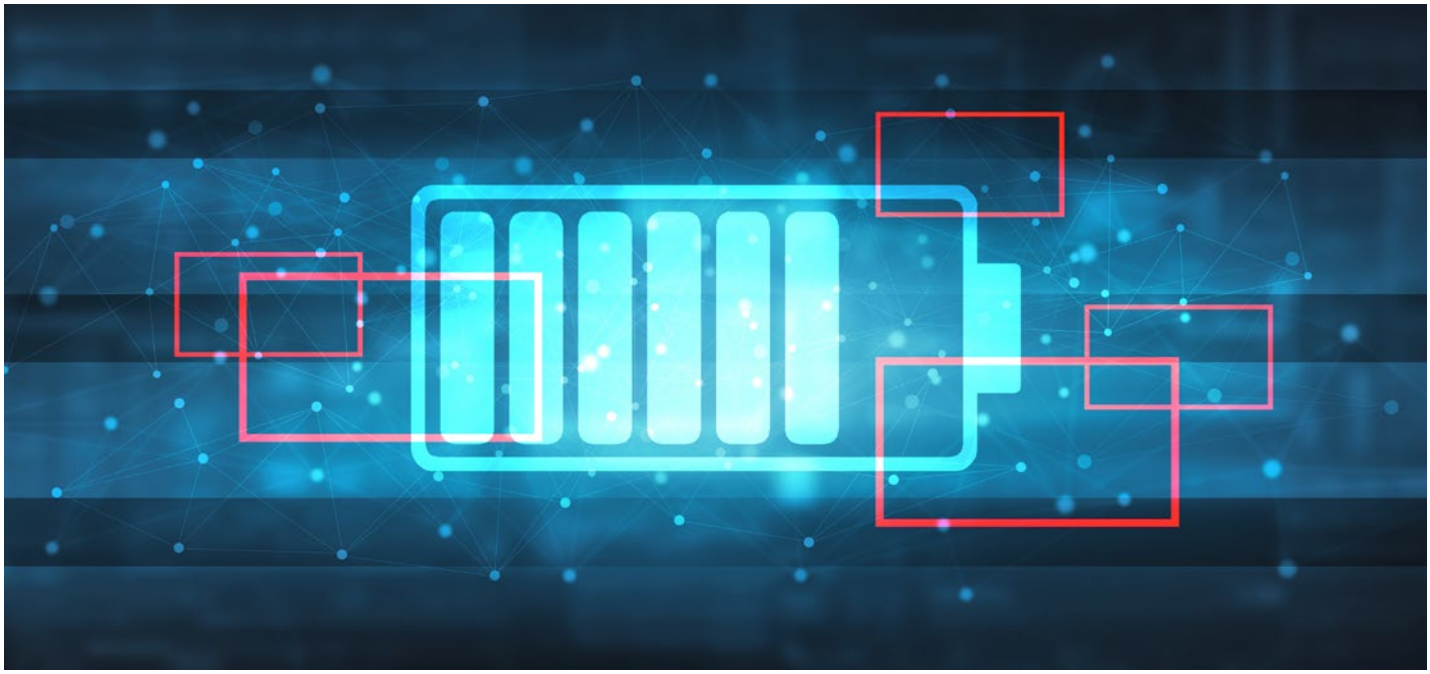
MOVITRANS® spot

MOVITRANS® line

How big is the demand for MOVITRANS® on the market?

The desire for free movement is huge, and continues to grow. With MOVITRANS® spot, we have now created the energy supply situation for this. At the moment, the difficulties I see are more in free navigation. There are already lots of solutions that work well, but I believe there are still a couple of problems to solve.

I think you could say that line-based systems are very popular at the moment due to their user-friendliness. Navigation makes things more complex for solutions that require free movement. However, I think once we get completely on top of that, there will be a clear trend toward factory workshops having more vehicles that move around without tracks than line-based ones. This in turn will mean the subject of “swarm intelligence” will become more relevant.



And what about the energy storage units? How high-performance are they?

Driven by electric mobility, we have in the past experienced an equivalent development in batteries with high energy density. Even in lightweight batteries that were expensive initially. The industrial demand is now leading to a rapid fall in prices in this area. **This is, of course, another point that will help MOVITRANS® spot take off.** After all, if the energy storage units required are available at suitably lower prices, then the proportion of vehicles moving around freely will grow further.

> **“The energy infrastructure worldwide is subject to a set of standards that is uniform on the one hand, but can still vary greatly at a regional level on the other.”**

Are there regional differences for contactless energy transfer, or special requirements when it comes to certification and standards, for example?

Fundamentally, MOVITRANS® can be used everywhere, because it is a system that can be connected to different voltage systems. Ultimately, however, there is always energy flowing, and if something goes wrong, it can cause a lot of damage under certain circumstances. This is why the energy infrastructure worldwide is subject to a set of standards that is uniform on the one hand, but can still vary greatly at a regional level on the other.

In the United States, for example, you need UL approvals. Traditionally, the requirements there are always somewhat higher. Particularly for insurance reasons, you have to take special measures there that you don’t have to worry about in other countries. In addition, there are also standards relating to field strength that must be observed in all systems that generate electromagnetic fields. There are regional variations in this, too. And last but not least, it has to be said that there are also local interests pushing certain systems or even discouraging them.

You mentioned the subject of insurance-related reasons. Do you have any reservations in that regard?

This is something that shouldn't be underestimated. In emerging countries that are currently seeing very dynamic development – and that definitely includes China – there are fewer reservations about these kinds of technologies.

In established industrialized countries such as ours, electricians learn the technology of energy installation from the ground up – first in school and then during their training. When they are familiar with the technology, they can use it without any problems. However, if they have not come across a certain technology in the course of their career, then there may well be more reservations about it. We have observed that there is a much greater readiness to switch to such systems in emerging regions. Interestingly, we are therefore experiencing a very dynamic response to the MOVITRANS® system in these markets – something that is great to see.

> **"Customers do not just buy a product, system or innovative functions from us – they buy a complete system, along with the associated reliability."**

So you might say it is an all-round package! What does that mean for customers who are aiming to set up a new infrastructure?

Well, infrastructure is the life-blood of every factory, after all. If the energy supply fails, then nothing works. The expectations on the power supply and its stability are therefore extremely high. You need a reliable partner at your side. That's why customers do not just buy a product, system or innovative functions from us – they buy a complete system, along with the associated reliability.

If something does not work, then they know they can call SEW-EURODRIVE at any time of the day or night and get skilled assistance – worldwide. Along with all the benefits I have already mentioned, this is the one thing that sets SEW-EURODRIVE apart and simply makes it the perfect choice for customers. After all, they know that once installation is complete they have created a reliable infrastructure with our help. As a full-service supplier, we support and accompany our customers and their infrastructure projects from the planning phase to installation and beyond, leaving them free to focus on their actual core tasks.

> **"Our whole life, which is becoming increasingly electrified, is influenced by how we can easily transfer energy – electrical energy – to other systems."**

You raised the subject of clean energy. There is hardly another subject that gets as much attention as environmental and climate protection at the moment. Do you think that MOVITRANS® can make a major contribution for the future in this regard?

I do. We have two infrastructure components that are perfect for cutting-edge energy management – first, there is MOVITRANS®, and second, we have Power and Energy Solutions, or PES, from our MOVI-C® modular automation system.

This is among the first approaches for our contribution to the Green Deal, something that is getting a lot of attention at present. The European Union is already creating requirements on this subject. We are already seeing the consequences of climate change in all the storms, floods, heat waves and forest fires – I think everyone must have realized by now that climate change is real and we urgently need to change something.

We will therefore do our part, too, and focus strongly on the subject of the 'Green Deal' in the coming years. This is why we are developing and working on this portfolio of MOVITRANS®, Power and Energy Solutions, etc., because these are all infrastructure components that are simply necessary for reaching the goal of CO_2-free energy supply. It is also why we will continue to invest systematically and keep driving the system forward. And it is the reason I am convinced that MOVITRANS® will become far more widespread than we can imagine now.

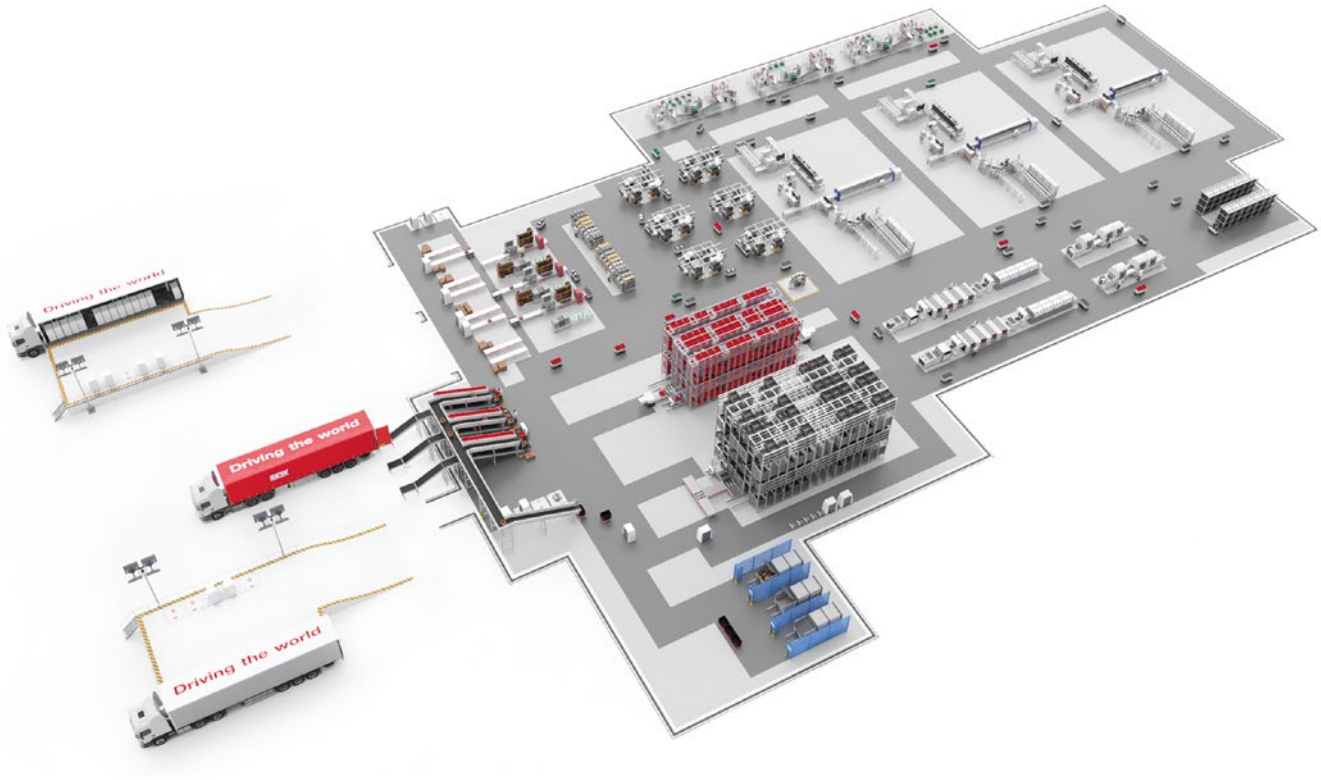
> **"We really are systematically focusing on the future and aim to design factories not only along Industry 4.0 lines in terms of automated communication, but also with energy networking."**

Power and Energy Solutions from the MOVI-C® modular automation system

What makes the possibility of combining the two infrastructure components MOVITRANS® and PES so unique on the market? And what innovative plans do you have for the future?

While MOVITRANS® is responsible for contactless energy transfer, that is to say transferring energy from the grid across an air gap from a line cable or field plate into the AGV, the PES safeguards the power supply and management of the energy stored in the energy storage units. **Thanks to this intelligent power and energy management system, we can protect systems from supply fluctuations and even power failures. This provides the highest level of availability.**

What's more, the PES system ensures that only as much power as absolutely necessary ever has to be drawn from the grid. No other provider offers this form of power supply. However, we have not yet linked these two infrastructure components. But we will in the future. We really are systematically focusing on the future and aim to design factories not only along Industry 4.0 lines in terms of automated communication, but also with energy networking.



What do you see as the link you are still missing? What remains to be done in terms of energy connections?

The link that I mean is to happen via energy storage units. Although both systems can currently fill the storage units, they can't fill the same unit at the same time. I can also see huge opportunities in connecting stationary systems with the mobile systems in terms of power, too.

Especially when it comes to applications with storage/retrieval systems, we are currently working on a couple of ideas. If we connect the PES system and MOVITRANS® cleverly with each other for this, particularly via energy storage units, then this opens up huge room for maneuver for us that we cannot even begin to imagine right now. SEW-EURODRIVE is therefore focusing on power supply and energy operations in factories, along with movement. There are already structures that link factories, but as things currently stand, energy only flows in one direction – into the factory.

> **"Industrial systems and industrial workshops have gigantic potential for energy generation. An active factory would be one that produces something while at the same time delivering a positive energy contribution. By connecting Power and Energy Solutions and MOVITRANS®, SEW-EURODRIVE is already offering the first possibilities for supporting such an aim."**

In other words, SEW-EURODRIVE is, so to speak, on the way to creating active factories, to draw the parallel to active houses – is that right?

For residential buildings, it has now become completely normal to talk about active houses, but I have never heard the term "active factory" before. But that is a good way of putting it. After all, industrial systems and industrial workshops have gigantic potential for energy generation. An active factory would be one that produces something while at the same time delivering a positive energy contribution because the surfaces it has available or that it occupies are simultaneously used to generate energy, and managing that energy, too.

I don't want to go too deeply into the technology, but in energy technology we often talk about reactive power. As things currently stand, even reactive power systems in factories are implemented externally – generally in a power plant hundreds of miles away. In the future, this will no longer be possible in a Green Deal without extra effort.

For a factory to be able to manage its own energy, it needs new components. With the combination of PES and MOVITRANS®, SEW-EURODRIVE is already offering the initial possibilities for achieving this. We have strong partners in this, especially when it comes to producing regenerative energy. These include many major partners with whom we have been working for a long time.

Such active factories could be very interesting for the automotive industry, where the much-discussed carbon footprints are an increasingly important factor. At present, the energy consumption in the factory is added to the footprint of the end product – that is to say, the vehicle. There are quite clear efforts to create a factory zero, or potentially even a factory that has a positive impact on the end product's footprint. If we can get to the stage of printing our CO_2 emissions certificates in the factories ourselves rather than buying them as is primarily the case at the moment, then this is a clear goal that plays a part in reaching the climate goals.

"Connected systems also make it possible to manage energy and performance better. In this way, I only provide energy when it is actually needed. And I feed it to exactly where I need it. We will therefore continue to move forward with this systematically, so that our devices fit perfectly well in networked systems. We are digitalizing our product portfolio."

Find out more about MOVITRANS®:

Interview 1: Factory automation // Smart factory
Interview 2: Charging vehicles inside and outside production facilities

On the corporate website:

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