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September 2025

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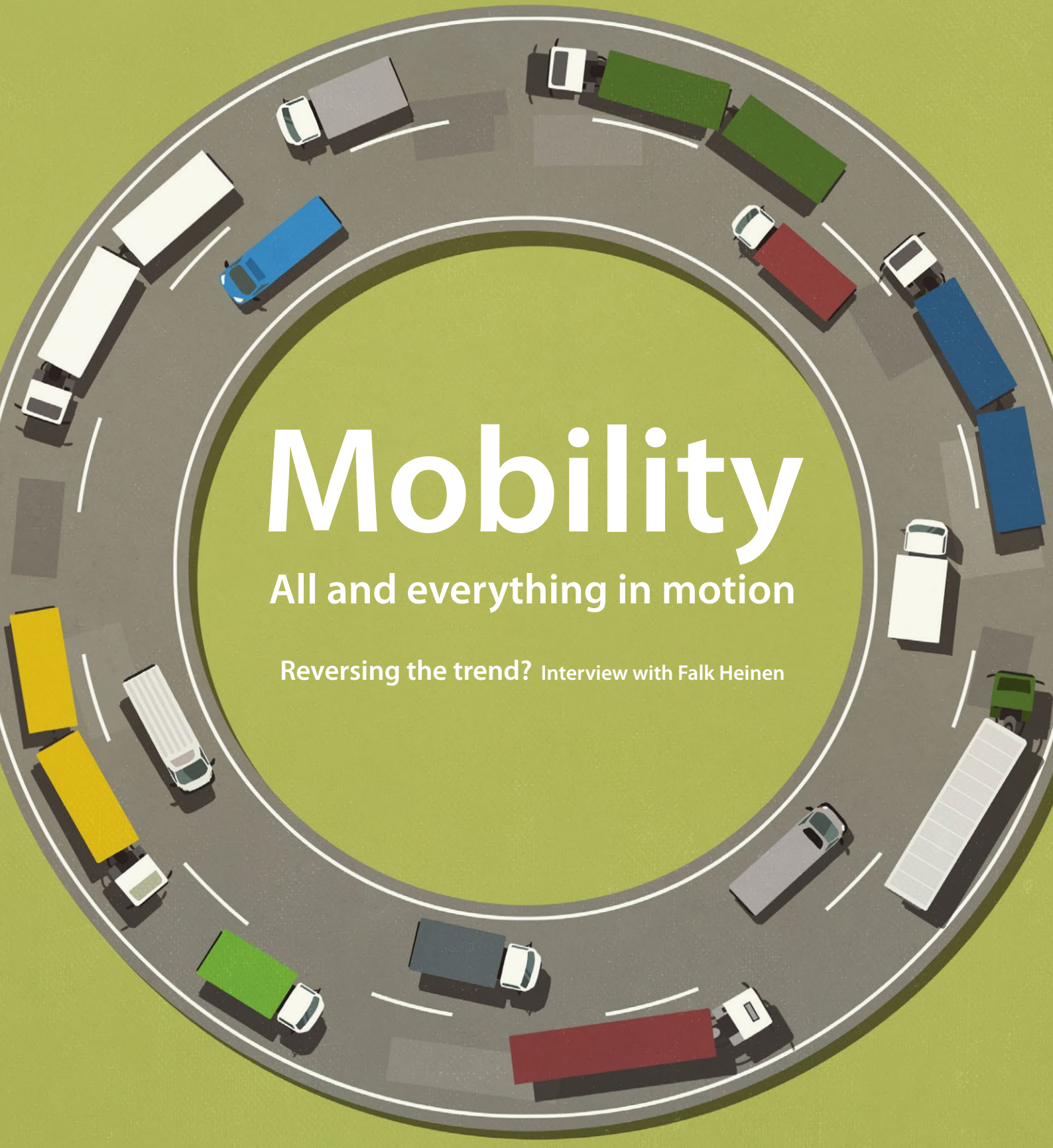

Mobility

All and everything in motion

Reversing the trend? Interview with Falk Heinen

Silent – with an added bonus

Anke Herold
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A silent revolution is under way: the mobility transition. By that, for once, I don't mean that electric vehicles are quieter than the combustion engine, but that change is happening almost by stealth in German mobility. This is evidenced by the fact that passenger car use has been continuously declining for more than 10 years: from 31.7 passenger-kilometres per individual per day in 2014 to just 27.7 in 2022. Average vehicle mileage has also fallen noticeably – by 17 per cent from 2011 to 2021. The number of registered passenger cars and motorcycles increased by 15 per cent over the same period.

People are now cycling and using public transport more often, showing that while a major leap forward in the mobility transition is still awaited at the federal government level, the public is increasingly climate-conscious. And in municipalities across Germany, there are countless initiatives that aim to make mobility more sustainable and equitable. A glance at Belgium shows the kind of positive impact that this can have: in Ghent, an ambitious mobility plan has greatly improved quality of life for everyone. The city started by massively expanding public transport and the network of cycle and foot paths. Then in 2015, it imposed strict limits on vehicle access and parking in the city centre. Multiple sites were unsealed and greened, and the cityscape has been significantly enhanced. Improved air quality and declining accident figures are an added bonus. The pace of change is impressive: Ghent achieved its 2030 targets for the mobility transition back in 2019, with car usage falling by around 50 per cent within just seven years.

When it comes to freight transport in Germany, there are major barriers, mainly due to the sluggish expansion of infrastructure. Policymakers need to make e-mobility a clear priority here, instead of slashing the funding for application-oriented research in this area, as occurred in 2024. We protested this move as part of a broad coalition of researchers and businesses. Germany is already losing ground here, putting both industry and the climate at risk.

Many policymakers are hesitant to interfere too much in private transport, often fearing that this could jeopardise their re-election prospects. They might like to know that following the measures taken in Ghent, Deputy Mayor Filip Watteeuw was re-elected by a large majority of voters. And wouldn't you do the same, given the great improvement in quality of life?

Yours,
Anke Herold

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Further information on our topics can be found online at www.oeko.de/en/ecowork-magazine

eco@work – September 2025 – ISSN 1863-2025
Published by: Öko-Institut e.V.
Edited by: Mandy Schoßig, Christiane Weihe
Responsible editor: Anke Herold
Translated by: Christopher Hay
Design/Layout: Hans Löbermann – Technical implementation: Markus Werz
Address of editorial office: Borkumstraße 2, 13189 Berlin, Germany
Phone: +49 (0) 30/4050 850, redaktion@oeko.de, www.oeko.de

Account Details for Donations:
GLS Bank, Bank Code No.: 430 609 67, Account No.: 792 200 990 0,
IBAN: DE50 4306 0967 7922 0099 00, BIC: GENODEM1GLS
Donations are taxdeductible for German income tax purposes.

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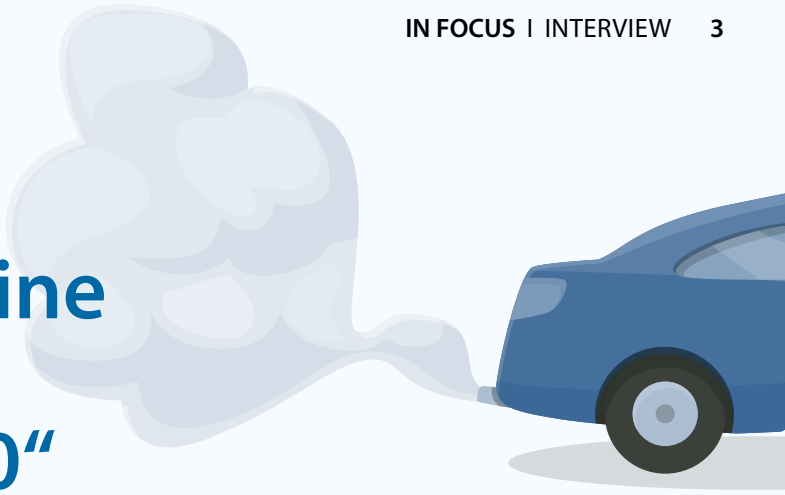

"Combustion engine vehicles will still exist beyond 2040"

When it comes to climate action, countless rules are in place to keep the transport sector on track – such as fleet limit values and carbon pricing. Which tools are most effective? What can Germany do better? And is electromobility the uncontested drive energy of the future? We discussed these questions with Falk Heinen, Head of the Technical Transport Issues and Fuels Division at the German Environment Ministry.

Falk Heinen, in your view, has a reversal of the trend as regards climate action in the transport sector finally been reached?
It is gratifying that after many years of stagnation, the forecasts finally offer us some hope of a reduction in emissions. This shows that fleet limit values for passenger cars and light commercial vehicles are an effective tool. However, they are now due to be reviewed and updated. Changes to the fleet limit values could undoubtedly weaken the ramp-up of e-mobility and thus dampen down the positive impacts on climate change mitigation. There is massive pressure from market players to soften the rules here; indeed, their efforts have already been successful.

What happened, exactly?
The CO_2 emission reduction targets set for 2025 were extended by three years to 2027. Naturally, this slows the pace of the transition. In fact, the manufacturers had enough time to prepare and many of them are already well on track to reach the targets. And of course, it's unfair on them if companies that didn't set the right course in time are now being rewarded.

Besides that, which instruments are effective?
The greenhouse gas reduction quota obliges all companies that sell fuels to cut these fuels' emissions through the use of renewable energies. As a legal requirement for the oil industry, the quota is already making a very significant contribution to emission reductions and will lead to further substantial cuts in the coming years. Our concept for implementing the Renewable Energy Directive in the transport sector envisages reductions ranging from 26 megatonnes in 2026 to 65 megatonnes in 2040. Regrettably, there have been cases of fraud, including falsified claims, in connection with biofuels in recent years, one outcome being that climate-damaging palm oil found its way to the petrol pumps. Extreme vigilance will therefore be required here.

What could Germany do better?
Quite a lot – with regard to transport planning or infrastructure, for example. In future, far more extensive parking and charging facilities for e-trucks will be needed along the motorways. On the issue of noise, too, there is still a lot of work to do; motorcycles are one example that springs to mind. Fundamentally, however, with the European rules, we have a very good framework that offers scope for effective climate action in the transport sector, provided that this framework remains in place and all countries comply.

What do you see as the greatest challenges in the transport sector?
In my view, it's important to look at transport through a global lens – and there are multiple challenges here. For example, in many booming countries, the number of combustion engine vehicles is increasingly dramatically. And not much has happened in aviation so far, although work on this sector has been ongoing for years. This particularly applies to the effects of greenhouse gases other than the climate gas carbon dioxide, which are extremely harmful to the climate, particularly as regards changes in natural cloud formation. There is no alternative to low-carbon fuels and mandatory quotas here – with corresponding risks such as land use effects in the case of cultivated biomass. But it makes no sense for one country to go it alone here: global agreements are required.

Is electromobility the uncontested drive energy of the future?
I would say so, yes. We simply have to cast a glance at Asia or America, where it is already very successful. The efficiency of the electric motor will ensure that it prevails. At the same time, a large residual share of combustion engine vehicles will still exist for some time. However, to ensure that Germany's transport sector is truly climate-neutral in 2045, these vehicles must be powered exclusively by climate-friendly fuels that are genuinely sustainable and protect the environment.

Thank you for talking to eco@work.
The interviewer was Christiane Weihe.

Talking to eco@work: Falk Heinen, Head of the Technical Transport Issues and Fuels Division at the Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety. Falk.Heinen@bmukn.bund.de

Breaking the gridlock

Movement in the mobility transition

For years, the mobility transition looked much like the German autobahn just before Easter: everything was at a standstill. But now the gridlock slowly seems to be breaking at last. Projections by the Oeko-Institut point to a downturn in emissions in future – mainly thanks to the EU Green Deal, particularly its fleet targets and combustion engine phase-out from 2035. Researchers from the institute's Resources and Transport Division are therefore expecting a further and more rapid decline in greenhouse gas emissions from transport in the coming years – but only if the policy framework remains unchanged or if, of course, its level of ambition is raised.

The future trajectory of emissions from the transport sector is underscored by the latest greenhouse gas projection data produced by Oeko-Institut experts in collaboration with M-Five and Fraunhofer ISI on behalf of the German Environment Agency (UBA). "Granted, they show that the transport sector is likely to miss its reduction targets for 2030 by 169 Mt CO_2eq. But it is also becoming apparent that the long-term emission curve is now very clearly heading downwards at last," says Peter Kasten, a mobility expert at the Oeko-Institut.

To a large extent, the transport sector currently has EU rules to thank for the downward trend – for the EU has set itself the legally binding target of achieving climate neutrality by 2050. Key mechanisms for reaching this target in the transport sector are carbon pricing, the greenhouse gas reduction quota – which requires the oil industry to use a certain percentage of renewables in its fuels – and fleet targets, along with the combustion engine phase-out, mentioned above. From 2035, all new passenger cars and light commercial vehicles registered in the EU must have zero carbon emissions. "With the EU legislation, we have a robust framework for climate action in the transport sector," says Peter Kasten, who heads the Resources and Transport Division. Indeed, he goes a step further: "In my view, we have already moved past peak emissions in the transport sector. This is partly due to more rapid renewal here compared with industry or the building sector, for example. Most of the passenger car fleet is replaced every 15 years or so."

To keep the transport sector moving in the right direction in the long term, however, the rules should not be contested. "It is not only about taking climate action seriously. It is also about providing a dependable environment for industry and its investments, instead of creating uncertainty with slogans like 'technology openness'. Continuity is also important to build consumer confidence in electromobility. Anyone clinging to the combustion engine is on a nostalgic trip into the past – that's evident from the number of e-vehicles, which is clearly increasing worldwide."

A CLEAR DOWNWARD TRAJECTORY

A downturn in emissions is certainly a good start – but greenhouse gas neutrality by 2045 is not yet within reach. How can it be achieved? In other words, how can we speed up the mobility transition? This was analysed by researchers from the Resources and Transport Division in cooperation with INFRAS in a project titled "Getting the Transport Sector on Track" on behalf of the German Environment Agency (UBA). "An accelerated transition requires more electrification and a shift to public transport. And for that, in turn, more investment is needed in climate-friendly transport options, as well as taxation that is more consistently aligned with vehicle emissions," Peter Kasten explains. A mileage-based toll for passenger cars also makes sense in the medium term, he says. The project team further looked at the economic effects of consistent action. "There are positive effects in terms of value added and employment. And a proportion of the additional revenue could go towards easing the burden on vulnerable households, who should also be given more support in switching to climate-friendly mobility."

BOOSTING INVESTMENT

Germany needs to invest in more sustainable transport. "The special fund agreed by the German government is welcome and has an important role to play, but reliable additional investment is required." The importance of this is also illustrated by the study "Towards a Climate-Neutral Germany", which was conducted in 2024 by the Oeko-Institut, Prognos, the Wuppertal Institute and the University of Kassel on behalf of Agora Think Tanks. "The good thing about the transport sector is that much of this investment is necessary regardless of the transition and the additional costs of more climate action are not particularly high. The change that is needed here can be initiated with a comparatively small injection of cash," says Peter Kasten. This is underscored by the study, which shows that more than 85 per cent of the investment projected for climate action in the transport sector by 2045 is necessary anyway. The main objective is therefore to channel the funds towards climate-neutral solutions. "This can be achieved with price-based mechanisms such as a motor vehicle tax that is more strongly aligned with vehicle emissions than at present. Some of the revenue could then be used to fund targeted incentives for low-income households to switch to electric vehicles." It is essential,

he says, to use these and other mechanisms to ensure a socially just mobility transition and to guarantee that everyone shares in the benefits – with options such as discounted public transport tickets for vulnerable households.

More rapid expansion of public transport and safe paths for cyclists and walkers is also crucial for a socially just mobility transition. "However, we shouldn't forget about rail transport – and this is where the costs are likely to soar. But then again, this is also where we are paying for past omissions," says Peter Kasten. The project team forecasts that in addition to maintenance costs, the funding requirements will amount to at least 4.6 billion euros per year between 2025 and 2030, rising to at least 6.3 billion euros per year in the subsequent period up to 2045, in order to significantly boost rail transport performance in passenger and freight transport.

STEP ON THE GAS!

In other words, in Peter Kasten's view, policymakers should not be complacent now that the EU Green Deal is in place. Instead, they should ask themselves how they can accelerate the mobility transition in Germany. There are numerous potential points of leverage here. The charging infrastructure for electric vehicles is a case in point. "A key step is to simplify and expedite approval procedures for the charging infrastructure. This is especially important for e-trucks." In addition, more price transparency at charging stations is required. "When you fill up your car with petrol, you can see when you drive onto the forecourt how much it is going to cost. Drivers of electric vehicles often have to find out this information for themselves, which takes a lot of effort, and there are countless offers that bear no relation to each other. At the very least, driving an electric vehicle should not pose more problems than driving a combustion engine car."

Christiane Weihe

Peter Kasten works on climate action and sustainability in transport. A graduate in Energy and Process Engineering, he develops strategies for CO_2 reduction in the transport sector and provides advice to policymakers and businesses. He heads the Oeko-Institut's Resources and Transport Division.
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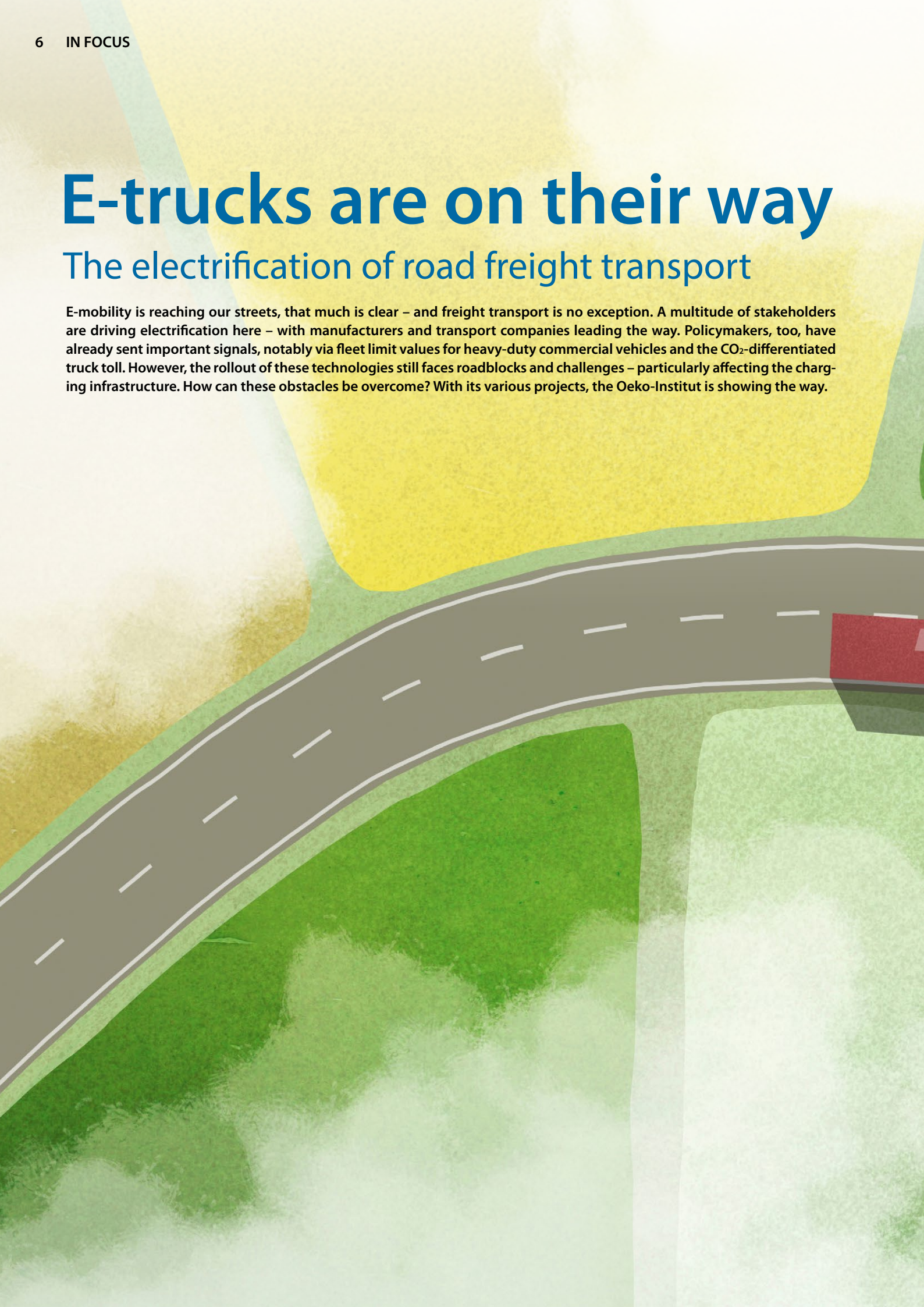
The latest revision of fleet targets reduces transport emissions by

3.9 Mt CO_2eq. by 2030

E-trucks are on their way

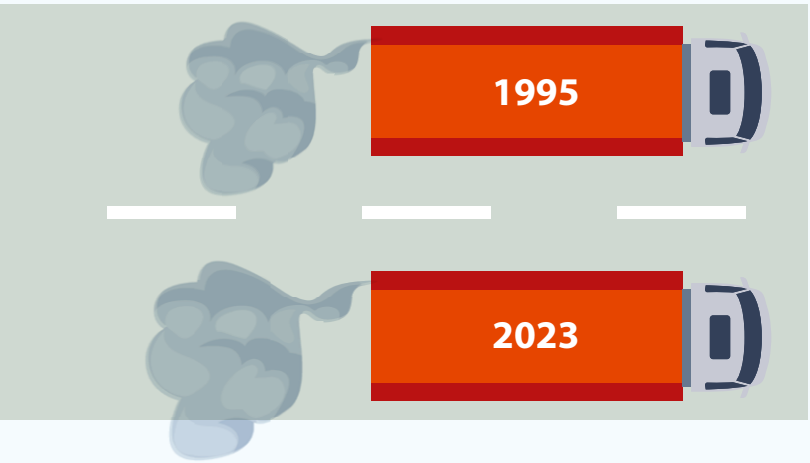
The electrification of road freight transport

E-mobility is reaching our streets, that much is clear – and freight transport is no exception. A multitude of stakeholders are driving electrification here – with manufacturers and transport companies leading the way. Policymakers, too, have already sent important signals, notably via fleet limit values for heavy-duty commercial vehicles and the CO_2-differentiated truck toll. However, the rollout of these technologies still faces roadblocks and challenges – particularly affecting the charging infrastructure. How can these obstacles be overcome? With its various projects, the Oeko-Institut is showing the way.

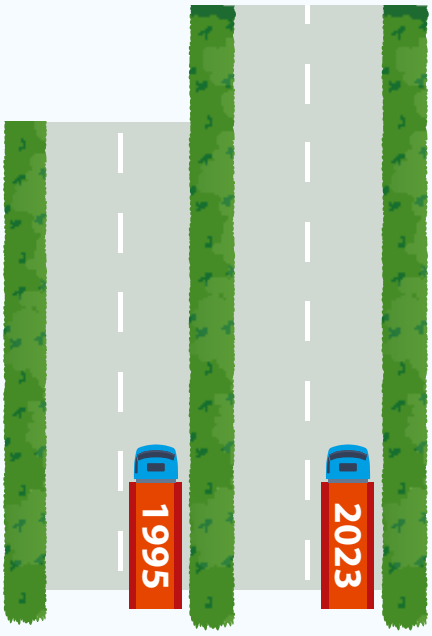


Electric road freight transport pays off – not only for the climate. A conversation with Florian Hacker, a Senior Researcher at the Oeko-Institut and Deputy Head of its Resources and Transport Division, reveals that e-trucks offer great benefits for drivers as well. "It's a very different workplace compared to a truck with a combustion engine, especially as regards background noise and vibration. I've spoken to many drivers who say: 'It's only now that we see how physically stressful the other ones were.'" An e-truck is also a far more modern working environment. "This particularly appeals to younger people, and in an industry that is struggling with a major shortage of drivers, this is a great competitive advantage that is actively used in recruitment." And as Florian Hacker emphasises, e-mobility works over long distances as well. "These days, the trucks have a range of up to 600 kilometres. At a speed of 80 km/h, this would normally include a mandatory break before the journey ends, and that's an opportunity to charge the battery."

The challenges for e-mobility in long-distance road freight transport mainly relate to the charging infrastructure. "Apart from that, there is already a shortage of parking facilities along the motorways, so it's important to create additional sites here," says Florian Hacker. However, appropriate infrastructure is also required in the depots where the trucks are parked and – ideally – charged overnight. "Establishing the infrastructure is feasible, of course, and anyone opting to generate their own power using photovoltaics can make considerable savings here. But first, they need to have a substantial amount of cash to hand to set up the system – and that's often extremely challenging, particularly for small companies." It also requires a grid connection with adequate capacity – which is an additional hurdle. "The charging stations for e-trucks need a far higher power output than those used to charge passenger cars. Installing them can take quite some time because the process is far more complex and costly than for a domestic grid connection, and there are currently long lead-in times." That's why forward planning of grid expansion is important, as is creating transparency about available grid capacity. "And the procedures for connecting to the grid must be simplified and accelerated as a matter of urgency at the same time."



CO_2 emissions from road freight transport increased by 14.6 per cent from 1995 to 2023 – despite technical improvements.



Between 1995 and 2023, truck mileage in German haulage increased from 47.8 to 60.5 billion km.

HEAVY-DUTY TRUCKS, SMALL BUSINESSES, FASTER EXPANSION

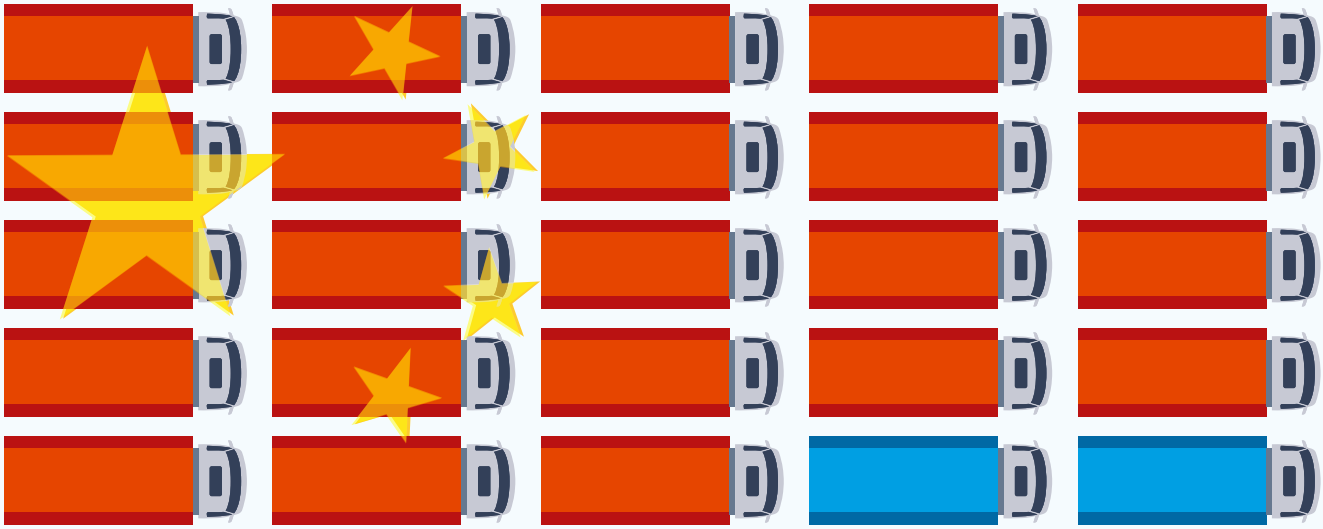
Low-emission vehicles and the required energy supply infrastructure have already received support from Germany's Federal Ministry for Digital and Transport in recent years. The corresponding funding programme under the KsNI funding guideline was evaluated by the Oeko-Institut in cooperation with the Fraunhofer Institute for Systems and Innovation Research ISI and aproxima Gesellschaft für Markt- und Sozialforschung Weimar mbH. "The evaluation found that thanks in part to the funding, far more low-emission trucks were registered – the number increased from around 9,600 vehicles in 2020 to more than 22,000 in 2023. The funding undoubtedly led to an early market ramp-up for e-trucks," says Florian Hacker. "At the same time, we recognised that more targeted funding will be needed in future, with a focus on heavy-duty vehicles, prioritising support for small and medium-sized companies and accelerating the expansion of infrastructure."

THE PRACTICAL TEST

Researchers from the Oeko-Institut were able to gain a very focused insight into companies' reality in the research project "Supporting research on the use of battery-powered heavy-duty vehicles in day-to-day logistics operations – ELV-Live". "Previously, the concrete effects of the use of e-trucks in practice and the need for charging infrastructure had not been investigated. So we monitored various areas of application and companies and the practical suitability of battery electric trucks over several years," Florian Hacker explains. "We also analysed the level of acceptance among companies and customers and looked at how things stand with regard to technical feasibility and economic viability." The project team also surveyed numerous manufacturers, including DAF, Daimler Truck and Volvo Group Trucks, about their product strategies.

The project, which is funded by the German Federal Ministry for Economic Affairs and Climate Action (BMWK), reveals that all the manufacturers surveyed are predicting the future dominance of battery electric trucks in road freight transport. There is also a high level of consensus within the industry on the challenges that lie ahead. "These mainly relate to reliable long-term frameworks and infrastructure," says Senior Researcher Florian Hacker. Here, too, it is apparent that the transformation puts heavy pressure on small transport companies in particular and that they need advice and support. "We also found that large logistics companies are already thinking about models of cooperation that enable subcontractors to access their infrastructure."

The charging of e-trucks in logistics depots was analysed in a further study, titled "Truck depot charging", conducted by the Oeko-Institut and the Fraunhofer Institute for Systems and Innovation Research ISI on behalf of the environmental organisation Transport & Environment (T&E). Depot charging is a key lever for decarbonising road freight transport. Around 40 to 50 per cent of heavy trucks drive less than 300 kilometres a day. These distances can easily be covered with night-time charging at the truck depot. "Currently, however, there is a severe shortage of data on the depots, grid connections and space restrictions, and therefore on the available potential of depot charging. That needs to change as a matter of urgency," says Florian Hacker. In the study, the researchers looked at e-trucks in Germany, France, Spain and the United Kingdom and conclude that the problem of grid connection is not unique to Germany. However, what is lacking, in addition, is reliable, publicly accessible information on available grid connection capacity. The study also highlights the difficulties faced by small and medium-sized enterprises (SMEs), which dominate the transport sector with a share of 70 to 80 per cent. "They are far less able to cushion investment risks than large logistics companies, as their



China is the world's largest market for zero-emission heavy-duty vehicles, accounting for 92 per cent of sales.

businesses have lower margins, uncertain contractual situations and often a lack of access to depots." The project team therefore recommends setting up funding programmes with simple application procedures and practical information services specifically for SMEs. "Unless we support them, they will cease to be competitive within a few years."

DEPOTS IN THE CAPITAL

Depot charging is a valuable resource, as the specific example of the state of Berlin reveals. Berlin Partner für Wirtschaft und Technologie GmbH approached us and asked what the switch to electric freight transport means in terms of infrastructure – specifically, what the level of demand will be, and where, and what practical action Berlin can take to establish suitable charging options." The project team, which also includes the Reiner Lemoine Institute, projects that around 3,300 battery electric trucks will be registered in Berlin and surrounding area by 2030, rising to between 20,000 and 26,000 by 2045, with a total electricity demand of 395-430 gigawatt-hours per year by 2045. "We assume that most of the charging demand will be met outside Berlin; however, publicly accessible charging hubs will also be required," says Florian Hacker. How can a charging infrastructure be established successfully? The analysis, which forms part of the "Electric Commercial Vehicle Study for the State of Berlin", identifies 23 recommendations for practical support measures. "Here too, depot charging is the preferred option, so this – along with grid connection for SMEs – should continue to receive financial support. However, some transport companies are reliant on publicly accessible charging points – and providing these in an urban setting is a challenge." Another sensible move, he says, is to promote cooperation with companies, expand the provision of information about the charging infrastructure for heavy-duty commercial vehicles, and intensify cooperation with the state of Brandenburg. Baseline data and research on the use of the charging infrastructure should also be expanded. Only on this basis is it possible to plan ahead and thus avoid not only obstacles in the development of e-mobility but also an uneconomical oversupply.

A STEADY HAND ON THE WHEEL

As well as infrastructure and support for SMEs, policy frameworks are a key factor in the expansion of electric freight transport, says Florian Hacker. "In our conversations with manufacturers, we repeatedly heard that the EU's strict carbon emission standards were the trigger for technological change. Regulation had a very powerful effect. What we need now are reliable long-term frameworks." Change can happen very quickly. "Vehicles that do a lot of mileage are generally replaced after four years, by which time they have clocked up half a million kilometres." And there are many potential beneficiaries of the switch to e-trucks. They include companies that are already investing in zero-emission transport, but also the climate and, not least, the drivers whose job it is to ensure, day after day, that goods reach wherever they are needed.

Christiane Weihe

Florian Hacker works on sustainable mobility through various lenses. His key focus of research includes alternative propulsion technologies and fuels, and electrification of passenger cars and heavy-duty vehicles. A graduate in Geoecology, he is the Deputy Head of the Oeko-Institut's Resources and Transport Division.
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