

**5 days**

ChatGPT

until 1 million  
people have been  
reached

**150 days**

Spotify

**300 days**

Facebook

**730 days**

Twitter

### Dissemination at breakneck speed

ChatGPT is spreading at an unprecedented speed – another reason for the sometimes unobjective debate.

# VDE Policy Brief

Edition 2/2023

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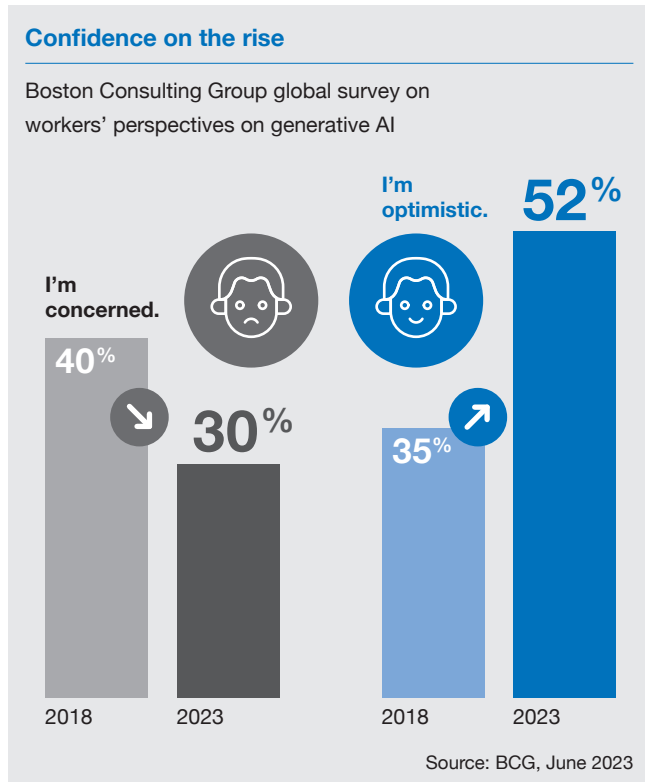
VDE Policy Brief online



**VDE**

# Facts, fiction, next steps

Generative AI – see ChatGPT – creates new and original content. Whether for text, image or video. The public debate ranges from enthusiasm through uncertainty right up to dystopia. Education on the implications is needed.



## Transparency: building trust infrastructure

Unfortunately, generative AI can also be used to falsify content in an automated and target-group-specific manner – an accelerant for disinformation and fakes in the digital space that can threaten the democratic community. Approaches like fact checkers are powerless against this. The idea of making AI-generated texts recognizable as such is not feasible. What matters first and foremost are infrastructures and technical solutions that make the trustworthiness of information and its sources recognizable. To this end, VDE is working with partners to establish a Trusted Information & Identity Lab (TIIL). Second, ethical guidelines and regulations that ensure responsible handling. [VDE's AI Trust Label](#) is ready for this. Politicians are urgently called upon to support these constructive approaches.

## Quality: Initiate research, enable testing

To date, no AI has its own will, its own consciousness. However: applications like ChatGPT formulate sentences in a way that is very polished and human-like – a dangerous illusion of quality and reality that cannot be verified today. This makes research projects all the more important for reliably identifying the gap between appearance and reality.

## Labor market: harnessing synergies

Wild estimates about the impact of generative AI keep circulating, barely rising above the level of coffee break guesswork. What is clear is that the new technology will greatly change the role of human workers in many industries and even replace them in some cases. This will give rise to sociopolitical challenges. At the same time, generative AI will open up new synergies between humans and machines. Three examples: technical texts can be formulated faster. AI applications will enable pharmaceutical researchers to identify effective active ingredients more quickly. Those who program apps will be more efficient with generative AI.

### We standardize AI

From VDE's perspective, the goal must be to achieve an innovation-friendly and responsible approach to generative AI. Norms and standards are an essential requirement here. VDE has been committed to this for years. See CEN-CENELEC JTC 21, which develops AI standards at the European level and thus underpins the EU's AI Act and makes it implementable. The chairman is Dr. Sebastian Hallensleben, VDE's head of digitalization and AI.

**Briefing**  
ChatGPT and other generative AI

**VDE website**  
Artificial Intelligence

**Article from the Policy Brief 2/2021**  
Enabling a trustful dialog

**Article from the Policy Brief 1/2021**  
AI ethics label offers orientation

## Growth in rail transport

# Driving AI-based systems forward

The transport sector is the German government's climate policy black sheep. To reduce CO<sub>2</sub> emissions, it is relying in particular on more rail transport. Passenger numbers, for example, are expected to double by 2030 compared to 2020. A mandatory prerequisite for this is maximized automation and the use of safe and tested AI systems.

The future of rail is fully automated and networked. Why? Trains can run at much tighter intervals, rail operations are more reliable, and safety is higher. So if you want to strengthen rail transport compared to road transport, you have to push automation. However, classic automation technologies have so far been insufficient to send, for example, regional trains – which have to pass through rail gates, arrive and depart at tens of stations every day and transport thousands of people safely over hundreds of kilometers – across the country without drivers. Remedies are promised by AI technologies, which have made enormous progress in recent years.

## VDE drives forward development

What is needed now are AI methods that are demonstrably robust and safe, for example, to be able to detect obstacles on the track with the necessary reliability. In the safe.trAI project, VDE is working with partners from research and industry to develop basic principles so that driverless regional trains can start in the future with quality assurance based on AI technologies.

### VDE E-Mobility Conference

VDE is driving the transportation and energy transition in a variety of ways. For example, the technology organization is hosting [its second E-Mobility Conference under the auspices of the German Federal Ministry of Digital Affairs and Transport \(BMDV\) on November 21 and 22, 2023](#). In addition to top politicians, around 200 decision-makers from industry and research are expected to attend.



#### VDE fact check

Autonomous driving in rail transport



#### VDE/DKE website

safe.trAI project

### Autonomous rail = climate protector

Within cities, autonomous trains are already running in several European cities – the efficiency gain is significant.



Energy demand for the metro in Paris and the London underground reduced by

**30%**

Source: German Railway Industry Association (VDB)

## Approval and standardization

Policymakers must now create framework conditions to enable AI methods to be used safely in rail transport. Particularly relevant:

- **Enabling approval:** To date, there is a lack of methodology to allow AI methods to be approved as safe. One important reason is that the AI's decisions are not sufficiently justifiable or comprehensible based on its training data. To address this challenge, the German Federal Railway Authority (EBA), the European Railway Agency (ERA), and research and industry must work more closely with established standardization organizations such as the DKE, which is supported by VDE. The aim must be to develop specific standards, test procedures and certification processes. Policymakers must support this by creating appropriate incentives such as funding and exchange platforms.
- **Reconcile global standards:** With around 55,000 employees, the German rail industry is the world market leader in many segments. It is therefore all the more important that standards on AI methods are advanced jointly with other world regions and within the framework of international standardization organizations. Resources must be made available for this.

## AI on the test bench

# Lighthouse project in Frankfurt

AI holds potential: for more climate protection and energy efficiency, for sustainable growth and product innovations. Companies must explore opportunities and launch successful projects. VDE, together with the state of Hesse, offers them the AI Quality & Testing Hub (AIQ).

In mid-February 2023, the AI Quality & Testing Hub was launched in Frankfurt. A global milestone: for the first time, interested companies can test, prove and improve quality properties of AI systems. What the AIQ offers specifically:

- **Consulting:** companies and organizations receive individual support for questions regarding AI quality.
- **Training:** Special training is being developed and offered to meet AI quality standards.
- **Training data:** Quality-assured test and training data sets are to be made available with which algorithms – and thus a core AI component – can be reliably tested.
- **Simulation environments:** AI applications require a comprehensive digital testing infrastructure. The AIQ will develop and lease the necessary simulation environments.

## Quality is a competitive advantage

Verifiable and secure quality is to become a unique global selling point of European AI systems – and thus an export hit. This also complements the objective of the AI Act, which is currently in the decision-making phase. One thing is clear: Existing safety standards must not be watered down for AI. It is equally important to ensure measurability:

For example, it must be clearly comprehensible how powerful, robust and transparent AI systems are.

For Europe to be at the forefront of 21st century technology, businesses and public administrations must invest in AI quality today. A hesitant wait until political requirements come into force, as with the GDPR, is not an option. With the AIQ, VDE is a competent partner.

### VDE as a pioneer

AI is one of VDE's main topics. In numerous discussions, workshops and hearings – see our work in the AI Enquete Commission from 2019 or our involvement in the European standardization organization CEN-CENELEC as well as the OECD – we offer our expertise to policymakers.

[The AIQ is a tangible result of this work.](#)

**AIQ**

AI QUALITY & TESTING HUB



### Website

VDE press release



### Article from the Policy Brief 4/2022

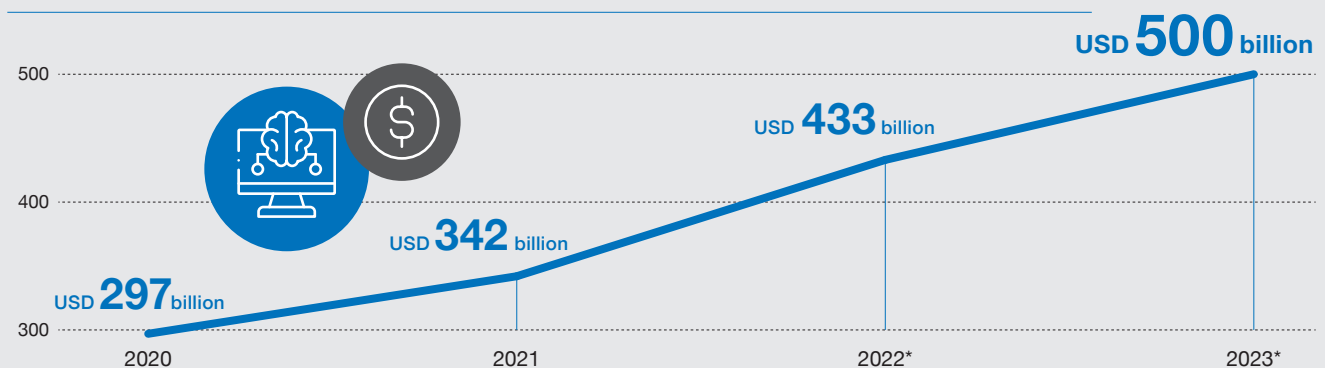
Germany and the AI pioneering role



### Article from the Policy Brief 2/2021

AI quality testing

## Global sales with AI



\*Prognosis; Sources: IDC, World Bank

# Germany needs more students – now!

Fewer and fewer people are starting a degree in electrical engineering and information technology. A political issue of the first order: This is where knowledge on topics such as the energy transition, electromobility or communication networks is taught. This creates the basis for Germany's technological sovereignty.

Within ten years, the popularity of studying electrical engineering and information technology has steadily declined by 35 percent. At the same time, the demand for corresponding engineers has risen considerably. What are the reasons for the lack of interest in higher education? How can countermeasures be taken? To this end, VDE has conducted a study that is unique in the world and surveyed around 710 students – including 50 high potentials with (very) good grades in math/physics/computer science – as well as almost 1,200 students of electrical engineering and information technology.

The good news: core topics in electrical engineering and information technology are catching on. For example, between 60 and 80 percent are interested in climate protection, AI and robotics. Two out of ten respondents would later like to work in the career field of IT, computers, engineering, technology. The bad news: the day-to-day job has a disastrous image. Young people associate

electrical engineering primarily with laying cables and installing Christmas lights.

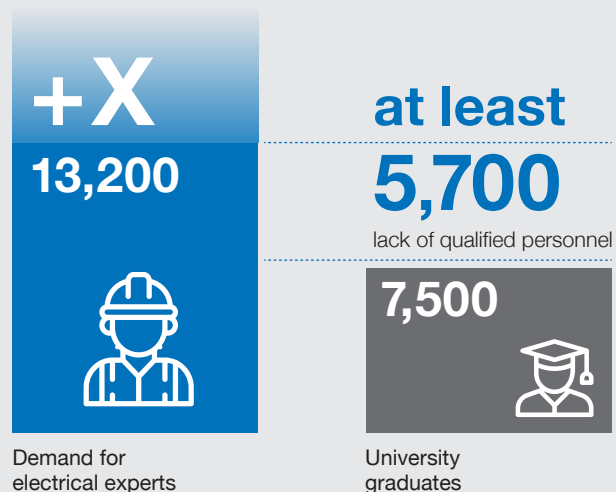
## Communication: 180-degree turnaround necessary

Schools, career counseling and the industry have obviously neglected communication about the occupational field. At the same time, the study tested elements of possible information campaigns with remarkable success. What to do now:

- **Improve career counseling:** From the young person's point of view, the offerings – whether in schools or the employment agency – are inadequate. Policymakers must make improvements here and aim for a direct exchange between interested students and companies and universities.
- **Support young people's events:** Young people can best inspire prospective students! For example, members of [VDE's Young Net](#) have held inspiring events with high school students in recent months. A success format that should be supported financially.
- **Launch an image campaign:** Germany urgently needs to promote electrical engineering and information technology on a broad scale. VDE is currently having a concept drawn up for an image campaign based on its study results.

### Not enough electrical engineers

Overall demand for electrical experts versus graduates in 2023



Sources: IW Cologne, microcensus, Federal Statistical Office; VDE

- **Clip**  
Technology Day @ School in Saarland
- **VDE study series**  
Publications on image and career choice
- **Website**  
INVENT a CHIP competition
- ⬇ **Article from the Policy Brief 1/2023**  
INVENT a CHIP impresses

## Energy transition

# Digital or not at all

With a massive increase in electricity demand, the share of renewables is set to rise from 48 percent to 80 percent by 2030. The task requires the transformation of the entire power grid – and more digital solutions.

Policymakers and companies must drive the digital transformation of the energy system to overcome hurdles such as planning and construction times or shortages of skilled workers. Digital twins – mirroring the real world with millions of charging stations and heat pumps, wind energy and photovoltaic plants – speed up planning and optimize operations. That's why digital twins must be advanced alongside the roll-out of smart meters.

### Breaking down data silos

Digital twins are well established in the industrial sector and have been proven to increase efficiency. In a comprehensive study, VDE has analyzed potential and use cases in the grid and electricity industry. Core task for companies: Break down the data silos that have been cultivated over the years, validate and merge the data. Then implement initial digital twins for specific use cases.

### Creating appropriate framework conditions

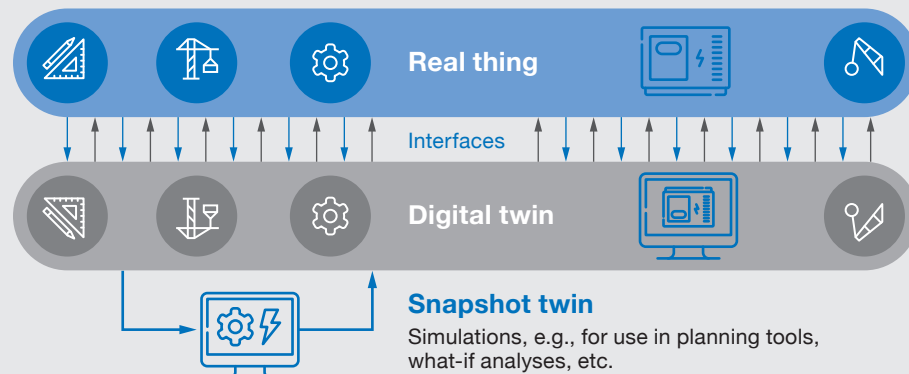
At the same time, policymakers are called upon to drive the use of digital twins. Key tasks are:

- **Allow higher network utilization:** Digital twins enable better risk management. Electricity grids can thus be utilized to a higher degree – an important measure in light of faltering grid expansion. However, the legal and regulatory framework is holding back this curative grid operation and urgently needs to be revised.
- **Demand digital transformation:** The expansion of renewable energies must be consistently linked with digital solutions. Because digital twins offer corresponding foundations, policymakers should demand them from grid operators.
- **Initiate support measures:** The potential of digital twins is considerable. In order to make them a reality and to push further research, government funding measures should be launched.
- **Accelerate standardization processes:** Digital twins are based on systems that are independent of manufacturers and hardware. Policymakers must provide incentives so that manufacturers and users jointly drive forward standardization.

### Carry out simulations more efficiently

Digital twins enable groundbreaking what-if simulations as early as the planning phase. To leverage the full potential, interfaces need to be determined and research projects initiated.

Planning — Construction — Operation — Disposal



- Study  
Digital twin in the grid and electricity industry
- Website  
VDE ETG
- Article from the Policy Brief 1/2023  
Shaping 100% renewables

## New life for old car batteries

# Tapping into potential

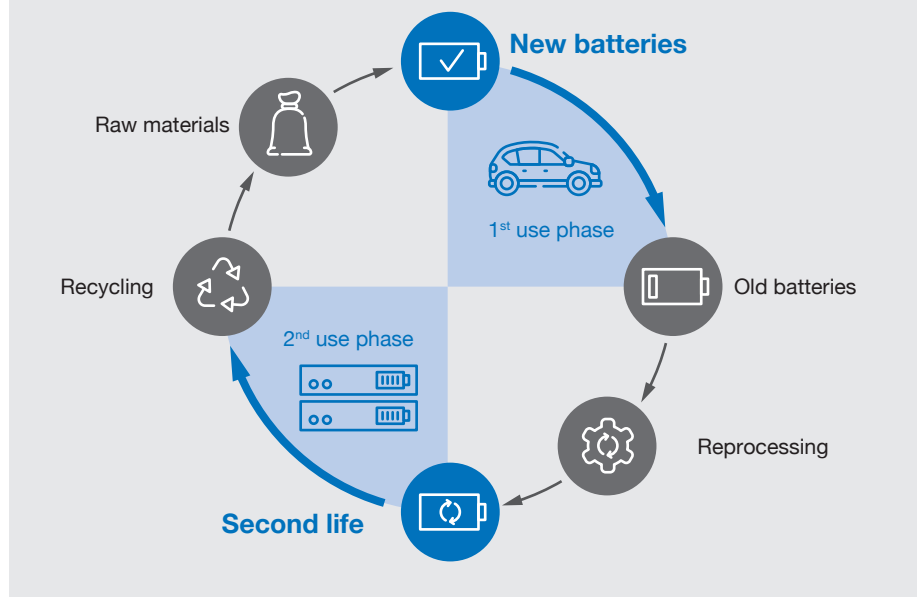
There are currently around one million electric cars on Germany's roads. The number is expected to rise to 15 million by 2030, according to the German government. This is accompanied by hundreds of thousands of used batteries every year. How to deal with them?

Political regulation is picking up speed, see the EU Battery Regulation. Second-life approaches in particular are under discussion. They aim to continue using discarded batteries from electric cars for other uses, especially since the energy storage units still have around 70 to 80 percent of their original capacity at the end of their life in the car.

VDE is playing an active role in the debate and recently published a fact check:

- **Building block for the energy infrastructure:** the growth of renewable energies requires a decentralized energy infrastructure including storage capacities for electricity from wind and solar energy. For example, the electricity supplier EnBW is testing a reference storage system comprising twelve former car batteries. The total capacity is around one megawatt (MW) – enough to supply several hundred households with electricity simultaneously, at least in the short term.
- **Time buffer for more efficient recycling processes:** Currently, lithium batteries cannot be completely recycled. For example, according to the EU Battery Ordinance (BattVO), the recycling of lithium is only expected to reach 50 percent by the end of 2027. The longer the batteries are used in each second life, the more time there is to recycle them using more efficient and resource-saving processes.
- **CO<sub>2</sub> reduction:** battery production contributes significantly to our carbon footprint. The longer the period of use – regardless of the type of use – the smaller the carbon footprint.

### Second Life essential approach to keeping batteries in circulation



To reap the benefits of the second-life approach, legislators must now create a uniform strategy for battery recycling and reuse. With the standards organization the DKE, which it supports, VDE is working on an initial EU standardization mandate on performance and shelf-life data for batteries. Nationally, the DKE has already developed a preliminary standard for the safe reuse of vehicle batteries – an essential prerequisite for the safe use of second-life batteries.

### VDE creates knowledge

There are numerous questions to be answered on the topic of second life. What condition are batteries in? What can rapid aging tests look like? We create clarity. This is how [VDE Renewables](#) evaluated safety and reliability as part of the [EMILAS project](#) funded by the BMWK. And on July 4, the DKE is inviting several hundred experts and top politicians to the [Innovation Campus](#) – where the future of the battery is to be focused on among other aspects.



**VDE fact check**  
Second-life batteries



**Website**  
Expert interview on battery regulation



**VDE/DKE website**  
All about lithium batteries

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## Facts and figures

	Founded:	<b>1893</b>
	Employees:	worldwide <b>2,000</b>
	Members:	almost <b>30,000</b>
	Volunteer experts:	over <b>100,000</b>
	Locations:	worldwide over <b>60</b>
	Research and funding projects:	<b>175</b>
	Events per year:	over <b>1,600</b>
	Product inspections per year:	<b>25,000</b>
	Electrical products bearing the VDE certification mark:	<b>billions</b>
	Norms and standards:	over <b>3,500</b>