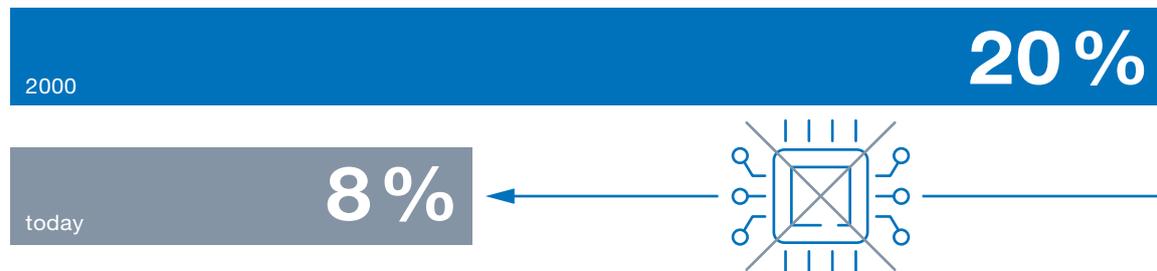




## Act now: EU Chips Act 2.0!

Europe's share of the global semiconductor market



# VDE Policy Brief

Edition 3/2025

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# Securing Europe's sovereignty

Microchips are vital for Europe in terms of innovation, economic growth and defense capabilities! This is particularly true in light of the current global upheavals. Politicians are called upon to promote European semiconductor production in an even more targeted manner. In its latest [position paper](#), [‘Hidden Electronics IV’](#), VDE highlights key areas for action.

Modern defense systems require highly integrated microelectronics; sensors, data processing and autonomous control are inconceivable without chips. Future technologies such as AI, robotics and quantum computers also require powerful chips. The problem is that although Europe has excellent expertise – see the Silicon Saxony success story – and is one of the world market leaders in individual areas such as sensor technology, the continent is falling behind in global competition, contrary to the objectives set at the beginning of the millennium. Its share of semiconductor production has fallen from 20 percent at the turn of the millennium to less than 8 percent. And in strategic market segments such as logic devices, Europe has dangerous deficits.

The EU Commission has recognized the relevance of the issue and proclaimed the EU Chips Act in 2023. The measures introduced are a step in the right direction, but they are far from sufficient to ensure long-term self-sufficiency in this key technology and to position Europe as an irreplaceable partner for other parts of the world. Europe needs an EU Chips Act 2.0. The core task is to create mutual dependencies through targeted investments, thereby increasing resilience to geopolitical disruptions. The key demands on European policy are:

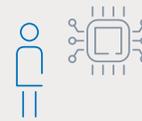
- **Strengthen the entire ecosystem:** Europe needs a strong semiconductor ecosystem across the entire value chain. There should be a special focus on manufacturing and design.
- **Targeted use of funds:** Funding must flow into areas where Europe already has strengths today. In addition, important technological shortfalls must be covered and the establishment of companies with the right focus must be promoted.

## Microchip industry as a job engine

The semiconductor industry has a broad economic leverage effect – from industrial suppliers to technology and IT service providers to regional infrastructures. Studies show that each job creates five additional jobs in related industries and trades.

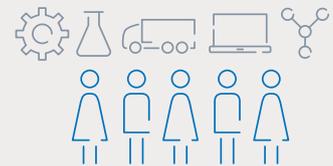
1

job in the chip industry



5

induced jobs



e.g. in plant engineering, the chemical industry, logistics, IT and infrastructure

Source: VDE, Hidden Electronics IV

- **Boosting innovation:** Europe must translate its excellent research more effectively into marketable innovation. Germany has some catching up to do in the area of start-ups and should provide targeted support, in particular by improving the availability of venture capital and lowering the barriers to access.
- **Benchmarking with other regions:** Governments around the world are launching XXL funding programs for semiconductor technologies and optimizing key framework conditions, as seen in the USA, China and South Korea. Europe must take a leaf out of their book and draw conclusions.
- **Strengthening partnerships:** Europe needs partners to ensure robust and diversified supply chains while securing skilled labor, critical raw materials and technological expertise. The focus should be on countries such as Japan, Taiwan and Singapore. These have complementary strengths, growing markets and technological expertise.



### VDE position paper

Hidden Electronics IV



### VDE website

Press release on the position paper



### Article from VDE Policy Brief 1/2025

Microelectronics: Facilitating technological sovereignty

# How renewables must work together

By 2045, Germany's electricity is to be generated in a climate-neutral manner. This is a mammoth project, especially in light of the planning and regulation required to achieve it. To help set the course for the future, VDE has published four background papers providing policymakers with a technically sound basis for the most important renewable energies.

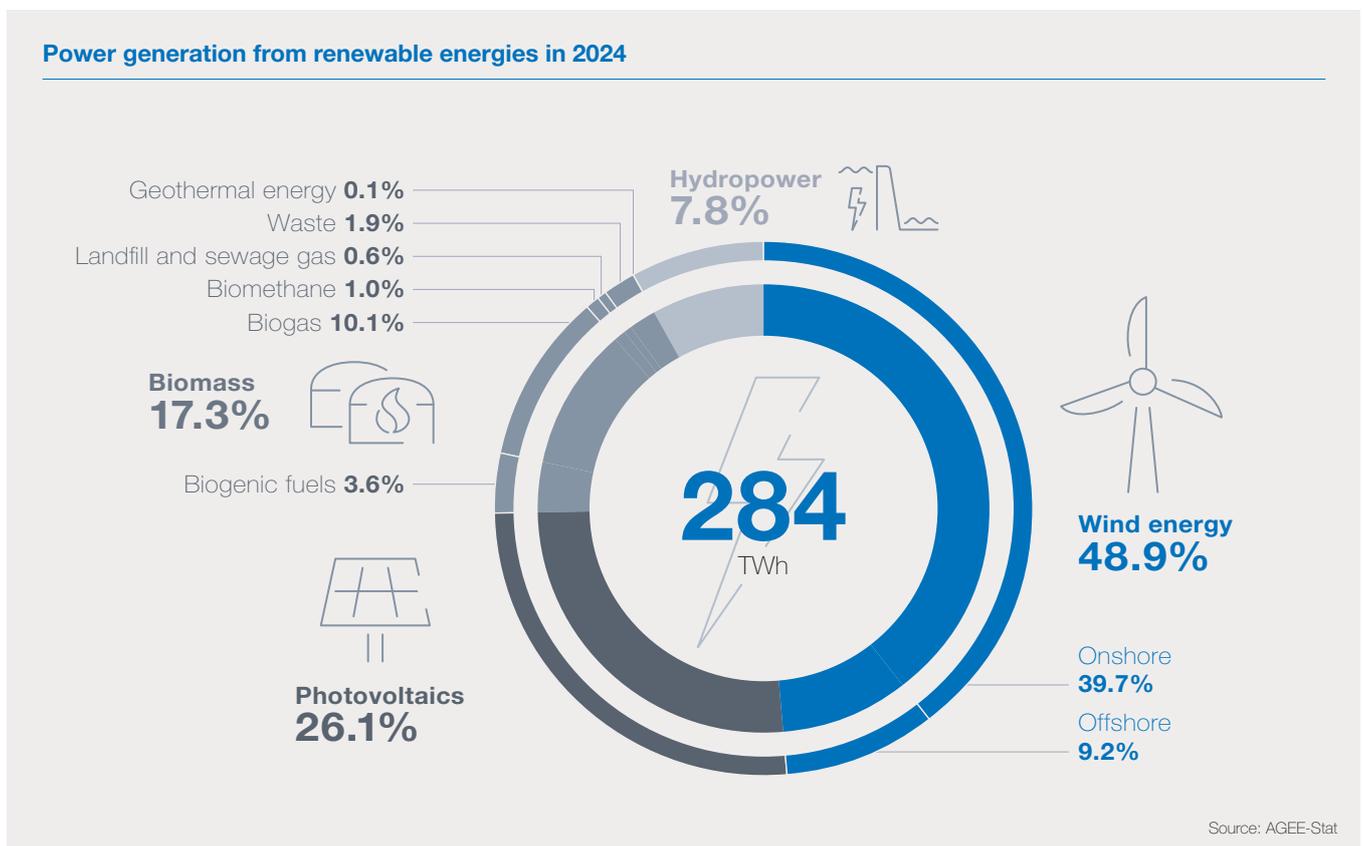
Even in the future, no single renewable energy source will be able to guarantee a sufficient and secure electricity supply around the clock and throughout the year. Only the coordinated interaction of technologies in conjunction with other generation technologies and storage facilities will ensure stability and security of supply. The profiles of the individual energy sources:

## Wind as the mainstay

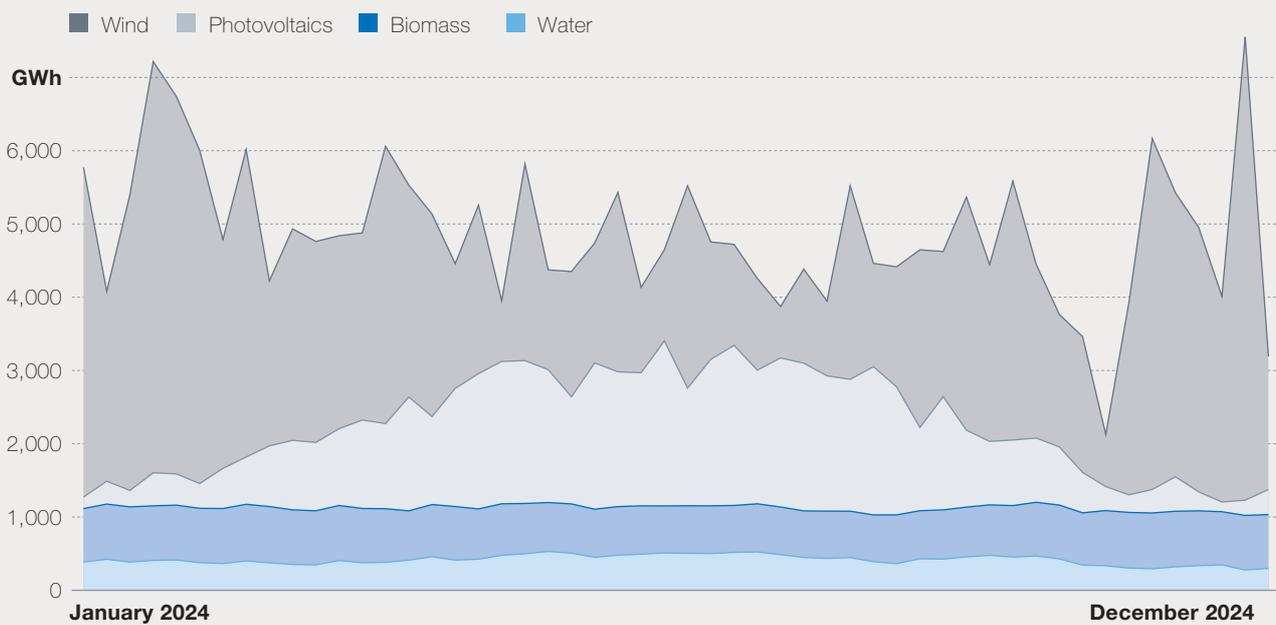
Wind power is the mainstay of renewable electricity supply in Germany. By 2045, it could roughly quadruple and supply up to 850 TWh of electricity. This would cover more than half of the projected electricity demand. The expansion is support-

ed by legislation. The Onshore Wind Energy Act obliges the federal states to designate minimum areas – by 2032, two percent of the nationwide area is to be achieved. By way of comparison, the figure was only 0.9 percent in mid-2024.

There are two fundamental limitations to the availability of wind energy. Firstly, electricity generation is subject to fluctuations depending on how strong the wind is blowing. Electricity yields are particularly high between October and April. Furthermore, there are always prolonged periods of several days with little wind throughout Germany. This means that when there is no wind, the wind turbines stand still. Secondly, at certain times, more wind power is produced than is demanded by the grid or than the lines can transport. In many



## Weekly net electricity generation by renewable energy source in 2024



Source: VDE background papers according to energy-charts.info

cases, wind turbines then have to be curtailed. In order to prevent this from happening to a large extent in the future, it is necessary to expand the high-voltage lines from the windy north to the industrially strong south of the republic. On the other hand, sector coupling under the slogan 'Power-to-X' offers possibilities for using surplus electricity. For example, green hydrogen obtained in electrolyzers can be used in the steel or chemical industry. Surplus electricity can also be used for heat generation or charging electric vehicles. Another option is to temporarily store the electricity in large battery parks or to use green hydrogen for long-term storage with subsequent reconversion into electricity. Nevertheless, the direct use of local large-scale consumers prevents high storage and grid costs.

### Strong growth in photovoltaics

After several years of stagnation, photovoltaics (PV) is growing significantly again. Today, over 100 GW are installed in Germany, with an expansion target of 400 GW for 2040. The advantages: PV can be used decentrally, is cost-effective and space-efficient. Seasonally, PV complements wind energy well, as solar power is mainly generated in summer when less electricity is available from wind power. A major challenge is that the sun does not shine all day long. For about half of the hours in a year, no PV electricity is generated at all. Conversely, PV systems already generate more electricity than the grid can absorb on many sunny days. Although many new buildings have battery storage systems, these

are usually designed for maximum self-consumption of PV electricity. Storage operation is therefore not network- or system-oriented. Since in many cases the storage units are already fully charged when the midday PV peak is reached, these home storage units do not relieve the burden on the grid. Furthermore, they are rarely used to provide system services such as balancing energy. With market-based incentives such as dynamic electricity tariffs and variable grid fees, home storage systems could contribute to reducing the load on the grid and increasing grid stability. Together with wind energy, temporary generation surpluses from PV systems can be used to supply flexible loads within the framework of the sector coupling described above or to charge large battery storage systems.

### Reliable and controllable hydropower

The 7,300 hydropower plants in Germany currently supply only a relatively small proportion of renewable electricity generation, at just under 8 percent. In Germany, there are also only a few unused sites with sufficient gradients for hydropower, meaning that the potential for expansion is very limited. Nevertheless, it plays a critical role in the system: its availability fluctuates only slightly and within narrow limits, depending on the availability of water. Hydropower plants thus provide a reliable supply of electricity and, depending on their technical equipment and environmental conditions, can be used flexibly and thus serve the grid. Unlike wind and PV plants, they feed electricity into the grid fairly evenly through-

out the day and throughout the year. Small hydropower plants in particular make an important contribution to local supply and grid stability thanks to their decentralized, constant feed-in. In addition, they can help to supply local island grids and rebuild the electricity grid in the event of a large-scale power failure – this is known as black start capability.

### Biomass flexibility reserve

Unlike wind and solar power, biomass is available all year round and can be stored in various forms – as wood, biogas or liquid energy sources. Biogas in particular offers great potential for system-oriented electricity generation. The prerequisite is that it is used flexibly rather than continuously. This allows biogas to supply electricity specifically when wind and solar power are unavailable. Today, however, biogas CHP plants often still run at constant output around the clock. Greater flexibility would make a significant contribution to the urgently needed flexible power plant capacity – and thus reduce the need to build new gas-fired power plants. The necessary market incentives for flexible use must be put in place here. In addition, storable substrates such as silage or straw provide further flexibility. Biogas, which is processed into biomethane and fed into the natural gas grid, can also be converted into electricity at a later stage. Biogas is thus increasingly becoming a buffer in the system – controllable to cushion peak loads.

### Holistic control of the system

The distribution of tasks for the transformation to 100 percent renewable electricity is clear: PV supplies mainly during the day and in summer, wind mainly in winter. Hydropower makes a largely constant contribution, and biomass can compensate for weather-related fluctuations when other sources are insufficient due to weather conditions. Sector coupling and long-term storage, for example via power-to-X or seasonal heat storage, convert surplus electricity into usable reserves. The right framework conditions are crucial – but so far, they are lacking.

## What needs to be done politically

- **Synchronizing grid and storage expansion:** The expansion of wind and PV plants must be consistently coordinated with the expansion of storage and grid capacities – particularly taking into account regional load centers and feed-in profiles.
- **Reward system- and grid-oriented operation:** Biogas and PV plants should be rewarded financially not only for the amount of electricity they produce, but also specifically for their contributions to grid stability and flexible feed-in. This also applies to the operation of storage facilities.
- **Securing hydropower as the backbone:** Where possible, hydropower should be modernized – with subsidies if necessary – in order to tap into controllable capacities.
- **Resolutely initiate flexible sector coupling:** The development of hydrogen infrastructure and the expansion of municipal heating networks and controllable loads must be driven forward in a targeted manner.
- **Accelerating digitization:** The rollout of smart meters must be accelerated and real-time control in the distribution grid enabled. Market incentives must be created for the flexible use of electricity in both consumption and feed-in, for example in the areas of e-mobility, heat control, and storage management.
- **Simplify building and planning laws:** Necessary construction measures – such as expanding biogas storage facilities – should not be hindered by bureaucratic hurdles. This requires targeted simplifications in building and licensing law.



#### Wind energy

VDE background paper



#### Photovoltaics

VDE background paper



#### Hydropower

VDE background paper



#### Biomass

VDE background paper



#### VDE website

Press release on background papers



#### Article from VDE Policy Brief 2/2025

System stability: preventing future blackouts

# Secure AI in network control technology

The power grid is becoming increasingly complex. Artificial intelligence (AI) can help to control it safely. However, its use in critical infrastructure must be well prepared. VDE shows how AI systems can be used sensibly and introduced safely. Politics and regulation play a central role in this.

The power grid is changing: more feeders, new loads, faster fluctuations. Grid control technology the control system used to monitor and regulate power grids so that generation and consumption remain in balance at all times – is under pressure. AI can provide support here with forecasts, status detection, or assistance systems. The first applications are already in use. They help to plan operations better, detect critical conditions early on, and relieve staff in a targeted manner.

## Using AI safely

AI in grid control technology must be reliable and traceable. VDE proposes a four-step model for this: define requirements, develop a model, test it, and put it into operation safely. The process is based on established standards such as technical safety management. This creates trust – even for sensitive applications. To promote its use, the model should be established as a reference framework for funding programs and approval procedures. A gradual introduction via low-risk applications is particularly useful. Real-world laboratories and test fields can help gather experience and build acceptance – among operators and regulatory authorities alike.

## Regulation must become practical

The legal framework is still unclear. The EU AI Act defines the term “AI system” very broadly, leading to uncertainty in practice. It is often unclear to network operators when an application is considered high-risk – and which requirements then apply. The result: delays in projects and uncertainty in investments. VDE is therefore calling for technical clarifications and comprehensible rules for documentation. There is an urgent need to strengthen the dialog between regulation, technology, and operation. This is the only way to prevent important innovations from failing due to excessive or unclear regulation.



### VDE study

Artificial intelligence in network control technology



### VDE website

Press release on the study



### Article from VDE Policy Brief 2/2024

AI Act: Specifying the law and strengthening Europe

## Risk categories according to the EU AI Act



Risk category	Regulatory requirement	Recommendation/obligation	Application examples
<b>Minimal risk</b>	Unregulated	Code of conduct recommended	Video games, spam filters
<b>Limited risk</b>	Low transparency obligations	Transparency regarding AI use	Chatbots, deep fakes, internal models
<b>High risk</b>	Comprehensive requirements for safe operation	Documentation obligations and transparency requirements	AI systems as security components for the management and operation of critical digital infrastructures
<b>Unacceptable risk</b>	Prohibition	Use of AI systems is not permitted	Social rating systems, manipulative AI, real-time biometric identification, emotion recognition in the workplace

# The next generation is ready

Global tensions, growing systemic conflict, and digital dependencies are putting pressure on Europe. Technological sovereignty is becoming a matter of survival. EUREL and VDE made it clear in Brussels: Young electrical engineers are ready to take on responsibility and will discuss the topic “Europe’s comeback: Microelectronics, resilience, and future technology” at EFTS 2025. This is particularly relevant in light of the upcoming consultations on the EU Chips Act 2.0.

Cross-border networks between young talent, research, industry, and politics are crucial. Only cooperation across national and system boundaries can open up solutions in microelectronics, energy transition, and cybersecurity – and thus lay the foundation for Europe’s stability and prosperity. The European Future Technology Summit (EFTS), organized by the umbrella organization EUREL under the leadership of VDE, offers a platform for this and is aimed at young and aspiring engineers from all over Europe. As in previous years, all available places were fully booked. VDE/EUREL EFTS rocks!

This year’s EFTS highlights:

- **7 workshops:** More than 50 young engineers took an in-depth look at the importance of modern microchips for AI applications, quantum computing, and other future technologies. Discussions also focused on how Europe’s communication networks can become more resilient and what framework conditions are necessary for technological sovereignty.
- **VDE Summer Reception in Brussels:** More than 200 guests from politics, science, and industry gathered at the Bavarian State Representation to the European Union. The keynotes by VDE CEO Ansgar Hinz and EU Commission representative Pierre Chastanet made it clear: If you want sovereignty, you have to improve location conditions, massively expand the training of skilled workers, and do both at the same time. VDE used the EFTS and Summer Reception to present its new paper [Hidden Electronics IV](#) in EU politics.
- **Award ceremonies:** The [EUREL PhD Best Paper Award](#) and the [EUREL TOPSIM International Management Cup](#) recognized outstanding research and practical business management. Because excellence in science and management is a prerequisite for Europe’s technological future.
- **Exchange with EU politicians:** During the visit to the European Parliament, there was an open exchange with MEP Moritz Kömer. The young engineers discussed issues relating to semiconductors, the energy transition, and digital security with him – a clear sign of the younger generation’s willingness to shape the future.

## EFTS 2025 in video

Three days of discussions, workshops and political meetings in Brussels: the European Future Technology Summit 2025 brought young engineers, politicians and industry representatives together around one table. Here are the highlights.



**Website**  
EUREL



**VDE Politics website**  
Highlights of the EFTS 2025



**Article from VDE Policy Brief 3/2024**  
EFTS 2024: We. Network. Europe. Young. Technology.



**Article from VDE Policy Brief 3/2023**  
EFTS 2023: Europe needs a future. The future needs Europe.

# VDE – the technology organization



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	Founded	<b>1893</b>
	Employees	worldwide <b>2,000</b>
	Honorary experts and members	<b>100,000</b>
	Sites	worldwide over <b>60</b>
	Research and funding projects	over <b>175</b>
	Events per year	over <b>1,600</b>
	Product inspections per year	<b>25,000</b>
	Electrical products bearing VDE certification mark	<b>billion</b>
	Norms and standards	<b>3,500</b>