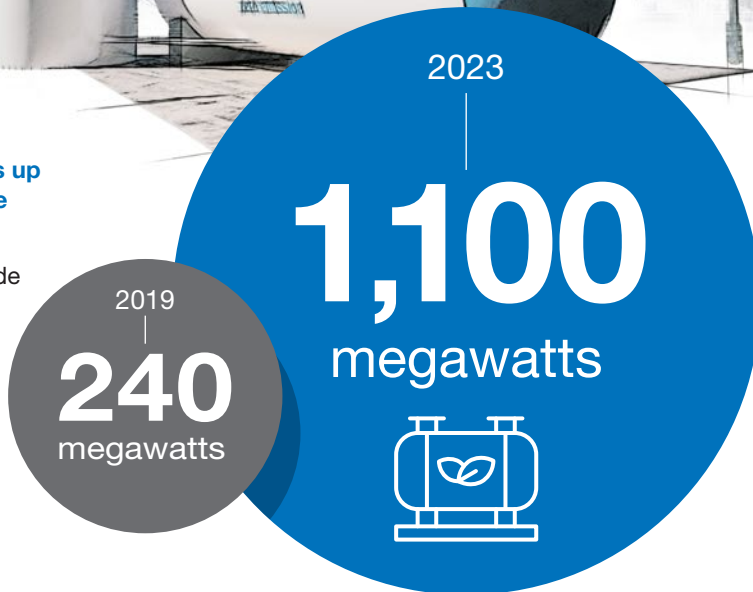


Green hydrogen production picks up speed worldwide

Electrolyser capacity worldwide



Sources: Hydrogen Council; McKinsey

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Edition 1/2024

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Strengthening resilience

Power supply and communication technologies are becoming increasingly interdependent – take smart meters and smart grids, for instance. Digital solutions depend on stable communication connections – which in turn depend on a stable power supply. In times of tense security situations and war, cyber threats and extreme weather events, these interdependencies harbor an entirely new set of risks.

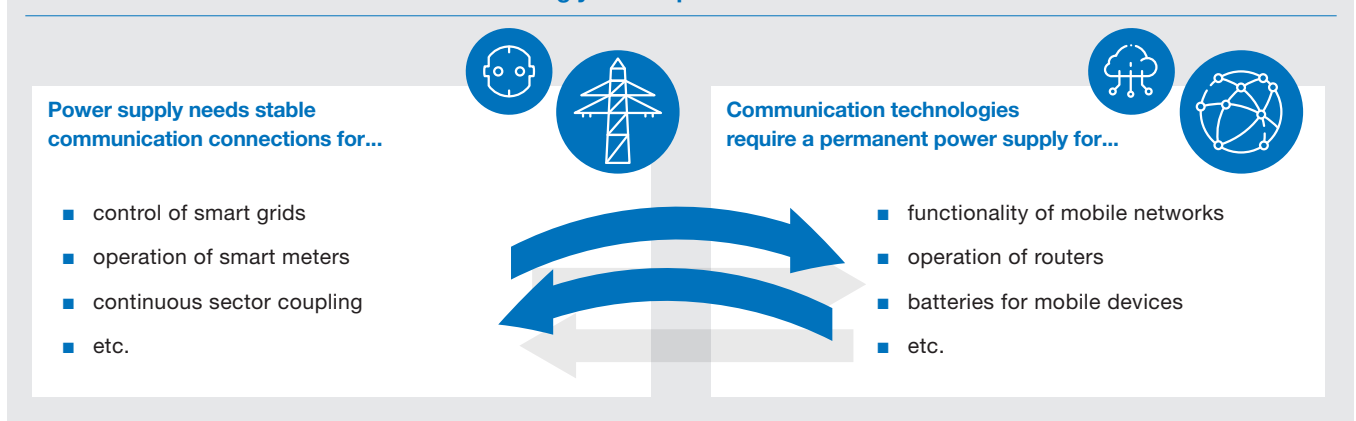
In a discussion paper, VDE examined the interactions between power and communication networks, and has identified solutions for strengthening the resilience of the overall system in four dimensions:

- **Raising awareness:** Electricity and communication networks and their reliable operation must become more of a social focus. They form the basis for all other infrastructures. Although resilience is associated with additional costs, it pays off economically because outages and damage can be avoided.
- **Acting across sectors and industries:** In a similar way to how thinking across different energy grids is already being done within the context of sector coupling, electricity grids and public communication services must also be considered together systemically. Thinking and acting across sectors requires the relevant knowledge and skills of the experts involved at operators, manufacturers and authorities, as well as

appropriate training and further education. This must be coordinated.

- **Thinking about disasters and terrorism:** Against the backdrop of possible exceptional cases, for example as a result of climate change or terrorist events, more measures must be taken. For example, the resilience of power and communication networks must be ensured in an appropriate and graduated manner with regard to technical developments and future risks.
- **Comprehensive planning and consistent implementation of measures:** A holistic plan can better safeguard power and communication networks. Measures should be assessed in terms of their effectiveness, urgency and technical and economic feasibility, prioritized and then planned and implemented.

Power and communication networks increasingly interdependent



 **VDE discussion paper**
Greater resilience for power and communication networks

 **Article from VDE Policy Brief 4/2023**
Promote flexibility now

 **Website** VDE ETG  **Website** VDE ITG

 **Article from VDE Policy Brief 1/2022**
Lessons from Putin's war in Ukraine

VDE is the first point of contact

The EU Battery Regulation (BattV) has been in force since mid-February. The goal: to strengthen Europe's battery market and reduce the negative environmental and social impact along the battery life cycle, from raw material extraction to recycling. This presents companies with opportunities, but also considerable challenges. VDE offers companies unique support – and helps to ensure that the legislator's goals can be achieved.

The pressure to act is enormous. In accordance with the BattV, companies must reliably meet initial requirements for battery performance and shelf life, safety and service life by August 2024 – otherwise they risk being excluded from the market. At the same time, the standardization organizations must work together with the industry to create numerous harmonized standards, including test standards. VDE offers unique support throughout Europe to master these challenges.

What we do:

- **Standardization:** The standardization organization DKE, which is supported by VDE, deals with topics such as reparability and the carbon footprint of batteries. As part of the European standardization organization CENELEC, the DKE is particularly responsible for issues relating to performance and shelf life. We ensure that new standards are formulated in a practical manner and that the requirements of the BattV are implemented.
- **Battery test:** In addition to the battery test center in Offenbach am Main, VDE operates the world's most modern test laboratories and can test all types of batteries and storage systems – whether for consumer electronics, medical devices or energy storage systems. Even during product development.
- **Certification:** The VDE Testing and Certification Institute ensures that batteries meet the requirements

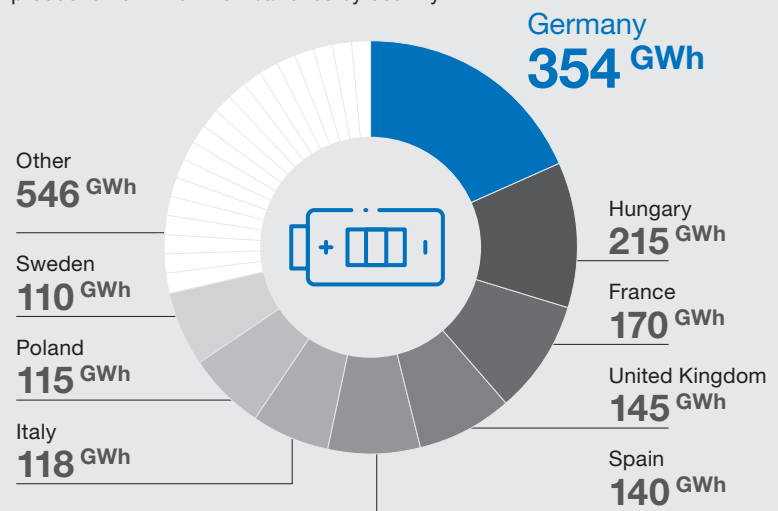
Need information in your own constituency?

Regardless of whether you are a start-up, medium-sized company or corporation: VDE supports German companies so that they can take advantage of the opportunities offered by the BattV. Policymakers can refer to the expertise of the technology organization at any time.

Please contact: politik@vde.com

Europe's battery cell production: Germany in the lead

Battery technologies are essential for the energy transition and battery markets are booming. Planned and already implemented projects in the production of lithium-ion batteries by country:



Source: Battery-News.de, date: December 2023

of the BattV and comply with the limit values for mercury and lead, for example. The institute also offers laboratory-based life cycle analyses and can calculate the carbon footprint in detail – setting VDE apart from everyone else.

- **Consulting:** VDE Renewables offers [public seminar series on the implementation of the BattV](#). The focus is on topics such as compliance requirements, potential and risk management. VDE Renewables also provides customized training and demonstrates best practice solutions for dealing with the regulatio.



VDE info paper

Battery Ordinance



VDE fact check

Second life batteries



Article from the Policy brief 2/2023

Potential of old car batteries

How the Energy transition will succeed

Germany is on its way to achieving a climate-neutral electricity system. The share of renewables is set to rise to 80 percent by 2030. However, wind, photovoltaic and battery storage systems have so far made hardly any contribution towards stabilizing the electricity grids. The System Stability Roadmap adopted by the German government at the end of 2023 now shows who has to do what and by when in order to ensure a secure power supply even with 100% renewables – and thus make the energy transition a success.

For decades, conventional power plants have automatically ensured that frequency and voltage are kept as constant as possible. They can compensate for any deviations due to disruptions in the electricity grid or excessive wind power feed-in within seconds. It is imperative that these capabilities are compensated for.

VDE plays a key role

The goal of the roadmap: From 2025, every new photovoltaic and wind power plant and every storage facility must also make a contribution towards system stability. The roadmap outlines 51 processes in detail that need to be mastered to achieve this goal. The VDE Grid Technology/Grid Operation Forum (VDE FNN) – whose membership includes over 480 manufacturers, grid operators, utilities, system operators, authorities and scientific institutions – and the standardization organization DKE (German Commission for Electrical, Electronic & Information Technologies), which is supported by VDE,

play a key role here: around every second process mentioned in the roadmap takes place under their leadership or with their involvement.

In general, VDE FNN, DKE and the Energietechnische Gesellschaft im VDE (VDE ETG) are doing pioneering work for secure system operation in three areas:

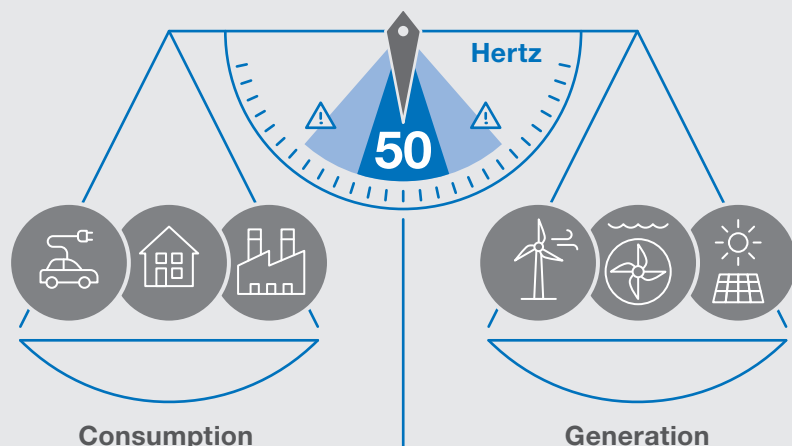
- **System balance:** The balance between generation and consumption must be ensured at all times.
- **Grid security:** Voltage and equipment loads must be kept within the permissible limits.
- **System stability:** The system automatically returns to a stable state in the events of faults.

Driving forward the energy transition

VDE is driving the energy transition. It offers unique expertise worldwide – and is the first point of contact for policymakers, society and practice.

Taking frequency as an example: ensuring stable grid operation

In Europe, the frequency of alternating current (grid frequency) is 50 Hertz. To achieve this, power generation and consumption must be in balance at all times and deviations must be responded to quickly. The roadmap shows how this service can also be provided with 100 percent renewable energy.



Federal Ministry for Economic Affairs and Climate Protection
System Stability Roadmap



Article from the Policy Brief 4/2023
Promote flexibility now



Article from the Policy Brief 4/2022
Strengthen the network

Focus on hydrogen

Hydrogen is of immense importance. It is needed for a carbon-neutral and diversified energy supply. Import considerations of 50 plus x percent are currently dominating many debates. Based on recent experience, it should be clear that Europe must avoid any dependency traps. The good news is that the continent has considerable hydrogen potential, as VDE points out in its white paper.

Europe has the potential to independently produce green hydrogen – made from H₂O and renewable electricity – at competitive prices! **Firstly**, the continent has considerable potential for solar and wind energy. In some regions, the production of photovoltaic electricity already costs less than 1 cent per kWh. **Secondly**, the extensive natural gas network can be used for transportation in the future. **Thirdly**, Europe offers political stability, which makes investment decisions easier.

This starting position should be used to ensure that hydrogen “Made in Europe” makes an important contribution towards the EU’s strategic energy sovereignty. Europe must not allow itself to be left behind again in an important field of the energy industry – namely photovoltaics and lithium-ion battery technologies. VDE’s white paper on the hydrogen economy provides the necessary impetus:

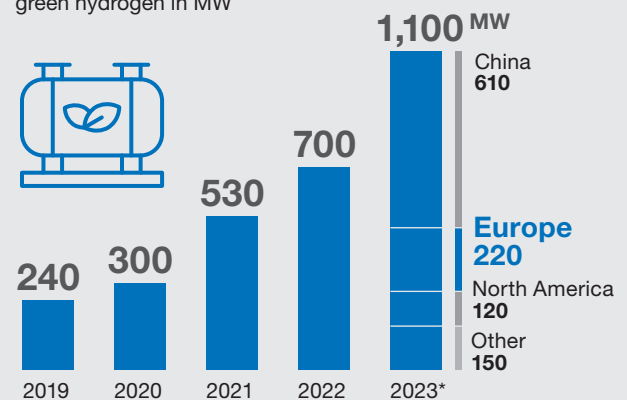
- **Reduce bureaucracy:** For years, the industry has been insisting on a remedy, but progress has been marginal. For example, the approval processes within the framework of the IPCEI (Important Projects of Common European Interest) funding instrument sometimes take over three years – too long a period of time.
- **Mobilize private capital:** The development of the hydrogen economy requires many billions of euros. In order to attract private and institutional investors, the risks must be minimized through forward-looking legislation and corresponding regulations and standards. New financial instruments are also required. A good example are the current guarantees from the European Investment Bank (EIB) for the expansion of wind energy.
- **Build trust:** Ignorance and unfounded skepticism about the hydrogen economy still prevail in many cases. It is important to report on successful projects with economically viable models and thus build trust among banks, policymakers and society.

VDE FINANCIAL DIALOGUE HYDROGEN 2023

At the beginning of December 2023, the [VDE FINANCIAL DIALOGUE HYDROGEN](#) brought together experts from business, politics and science along the entire value chain of the hydrogen economy. Core topic: Developing commercially promising business models for hydrogen technologies in conjunction with renewable energies and battery storage systems.

Hydrogen production: China in the lead

Installed capacity of electrolyzers for the production of green hydrogen in MW



*Date: October 2023

Sources: Hydrogen Council; McKinsey



VDE white paper

The hydrogen economy



DKE discussion paper

Circular economy and hydrogen technologies



DKE website

Hydrogen and resource efficiency



Interview

Background from the authors of the DKE discussion paper



DKE website

Standardization roadmap for hydrogen technologies

Harmonized European standards

EU Commission under pressure to act

Harmonized European standards are a cornerstone of the internal market and a strategic tool for companies. The European Court of Justice (ECJ) recently dealt with these standards. Key statement: In the case of an overriding public interest, they must be freely available. But how does this fit in with copyright law? The EU Commission must now find a solution – and we are offering our support.

Harmonized European standards are developed in the European standardization organizations CEN and CENELEC. The standardization organization DKE, which is supported by VDE, also plays a leading role in Europe. In total, thousands of experts from industry, research, civil society and the public sector are involved in standardization processes. Apart from the voluntary commitment, the work of the standardization organizations is financed by the sale of standards. This shows that standardization is geared towards actual needs.

Division of labor confirmed

Important: The ruling does not call into question the copyright protection of standards – and therefore not the established European standardization system either. The ECJ also confirms that harmonized standards are created and managed by private-sector standardization organizations and that their application is voluntary. Although they are part of EU law, they are not to be regarded as laws or regulations. This also confirms the tried and tested division of labor between the European Commission and private-sector standardization.

EU: Standardization of paramount importance




This robust European standardization system is of paramount importance for Europe. In its standardization strategy, the EU Commission emphasizes that Europe's competitiveness, technological independence and the protection of European values depend heavily on the successful involvement of European players in international standardization.

In order to achieve these goals and expand Europe's leading role in international standardization, a well-functioning European standardization system and links to international standardization are essential.

Standards are drivers of transformation

The green transformation of the economy is only possible if numerous players around the world cooperate and develop solutions. Standardization is a key factor in this regard.

Here are three examples:

- **Artificial intelligence:** climate change poses highly complex questions that need to be answered quickly. AI will be indispensable here – and must be mastered safely. With the application rule VDE-AR-E 2842-61, DKE has developed the first normative framework for the complete life cycle of cognitive systems. 
- **Sustainable raw material cycle:** The international standard IEC 62430 provides knowledge for the implementation of circular economy strategies. This standard is an indispensable guide for companies that want to design their products in an environmentally conscious way. 
- **Electromobility:** E-mobility requires a Europe-wide charging infrastructure. To achieve this, the vehicle, charging station and power grid must interact optimally – the ISO 15118 series of standards helps to implement the necessary communication interfaces. 



Press release

Copyright protection remains intact



DKE interview

Strengthening harmonized standards



Article from the Policy Brief 1/2023

Standardization as a geopolitical instrument



VDE press release

Standards as drivers of transformation

VDE – the technology organization



Your contact

Markus B. Jaeger

Head of VDE Policy

VDE Verband der Elektrotechnik
Elektronik Informationstechnik e.V.
Bismarckstraße 33
10625 Berlin

Cell +49 171 7631986

markusb.jaeger@vde.com

Contact details as vCard:



Publisher

VDE Verband der Elektrotechnik
Elektronik Informationstechnik e. V.
Merianstraße 28
63069 Offenbach am Main

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Facts and figures

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