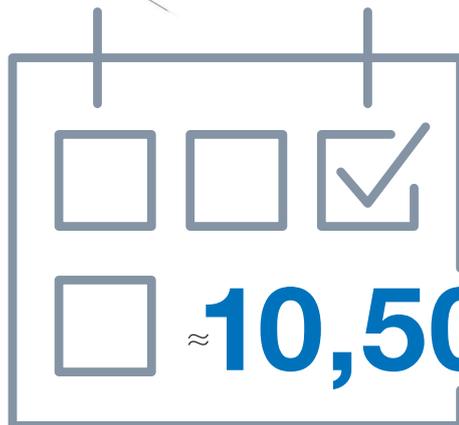


Standardization roadmap for hydrogen technologies

Standards pave the way for
future technologies – and are
costly to create!



180 recommendations 

in
≈ 10,500 working days

by
460 experts 

VDE Policy Brief

Edition 3/2024

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Hydrogen

VDE drives forward topic of the future

Hydrogen is the energy source of the future. This applies to industrial production as well as to electricity, heat and areas of mobility. VDE is involved in a variety of ways to advance this topic, which is so important for Germany. An overview.

July 2024: Standardization roadmap

Hydrogen technologies urgently need to be standardized. For example, there is a lack of clear rules on how to connect electrolysers safely to electrical circuits. As a result, each individual plant is considered a pilot project, which increases the effort for all market players immensely. The demand is considerable: at the end of July, the DKE, the standardization organization supported by VDE, published the hydrogen technologies standardization roadmap together with partners – and made over 180 relevant recommendations for action.

Standardization is thus the foundation for enabling the market ramp-up of the new technology. In addition, early standardization also puts Germany in a position to help shape requirements at the international level – a clear

competitive advantage for domestic companies to successfully compete in tomorrow's markets.

March 2024: Impulse paper

For hydrogen technologies, critical raw materials such as platinum or iridium often have to be mined – including significant CO₂ emissions. The concept of the circular economy uses materials that are already in the value cycle and thus offers great potential for reducing emissions. Within this context, standards are key drivers, as VDE and its partners show in an impulse paper from March 2024.

January 2024: White paper

Europe will need immense amounts of hydrogen in the future. Debates are often characterized by fantasies of importing 50 plus x percent. In a white paper published in early 2024, VDE was able to show that there is another way: Europe can produce green hydrogen itself on a large scale at competitive prices. How can this be achieved? Reducing bureaucracy, mobilizing private capital and communicating successful projects are the key words.

December 2023: Conference

VDE also promotes direct exchange. With VDE's FINANCIAL DIALOGUE HYDROGEN, the technology organization has created a platform that brings together experts along the entire hydrogen value chain. Core topic: developing commercially promising business models.

Standardization: a complex task

Standardization means: finding a common understanding on future topics and agreeing on essential rules with numerous stakeholders from industry, science and civil society. The effort is considerable, see the development of the standardization roadmap for hydrogen technologies, which was commissioned by the Federal Ministry for Economic Affairs and Climate Protection (BMWi):

7 project partners

40 participating employees



≈ 8,300 working days*



39 working groups with representatives from companies, associations and institutions

600 participating employees



≈ 2,200 working days**



* Basis: project planning; ** Rough estimate



VDE website

Standardization roadmap for hydrogen technologies



DKE website

Hydrogen and resource efficiency



VDE white paper

The hydrogen economy



Article from VDE Policy Brief 1/2024

Europe's energy independence



Article from VDE Policy Brief 1/2023

Flexible use of electrolysis

We. Network. Europe. Young. Technology.

Europe must focus on the future. Tense security situations, cyber threats and increasing dependence on despots around the world condemn us to succeed. Otherwise, Europe will lose out in the technological showdown with America and China. The generation under 35 years of age will have to play a prominent key role.

VDE and the European umbrella organization EUREL regularly bring together the next generation of engineers in electrical engineering, electronics and information technology with decision-makers – as they recently did at the [European Future Technology Summit – EFTS 2024](#) in Brussels. Russia's terrorist war of aggression on Ukraine has ruthlessly exposed our vulnerability. We need electricity and communication networks that are highly resilient across borders. One thing is clear: AI, standardization and technological collaboration will determine the survival of the continent in the coming years. With this in mind, VDE and EUREL have brought together 50 students and young professionals from Europe to discuss with experts from science, research and politics:

■ 10 workshops:

Using the example of Ukraine, the effects of military and terrorist activities against critical infrastructure (energy and communication)



were highlighted. How can the resilience of European electricity and communication networks be strengthened? What challenges need to be overcome? What role can new technologies play and where are potential new gateways for unfriendly manipulation? A [video of the EFTS](#) and a detailed report on the contents of the workshops, the speakers and their presentations are available on the [EUREL website](#).

■ **VDE Summer Reception:** VDE's Summer Reception in Brussels traditionally takes place as part of the EFTS. Particularly impressive this year: two female experts from a Ukrainian energy supplier gave a first-hand account of the daily challenges faced by Ukrainian engineers in the face of Russian missile attacks on infrastructure and cyber attacks that have been taking place for over ten years. Her report left no room for illusions: Europe must learn from Ukraine's experiences before it is too late.

EUREL Field Trip 2024: Embodying European technological diversity

To overcome borders, EUREL organizes annual [Young Engineers Field Trips](#). The 2024 host was the Spanish EUREL member Ingenieros Industriales. In the Madrid area, 20 students and young professionals in electrical engineering, electronics and information technology were given exclusive insights into various power plants, technology companies and wind farms.

- **Dialog with EU policymakers:** At a meeting in the European Parliament, the young engineers from EUREL discussed with [Prof. Andrea Wechsler](#) (Committee on Industry, Research and Energy), a member of the European Parliament for the Christian Democratic Union (CDU). Their clear message: European collaboration is key – especially in the technical and engineering fields. Institutions like VDE help policymakers understand the role that technology can play.
- **Awards ceremonies:** The EUREL International Management Cup (IMC) introduces students and young professionals to management areas of companies. The EUREL PhD Best Paper Award honors groundbreaking doctoral theses – the winners of the competitions were honored in Brussels.



Website
EUREL



Article from VDE Policy Brief 3/2023

Europe needs a future – the future needs young people

VDE inspires young talent

Germany needs young people who are passionate about electrical engineering and information technology. They are passionate about driving innovation and overcoming key challenges – from climate protection and cyber security to the energy and mobility transition. VDE supports them in a variety of ways. Four examples:

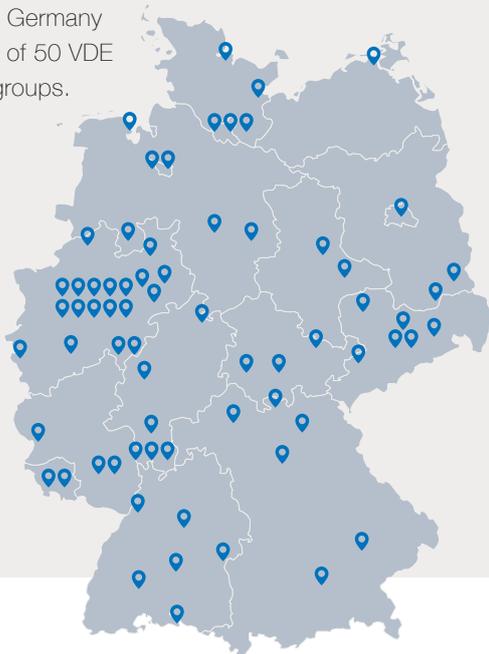
- **Student competition:** The whole world is talking about AI – and VDE is encouraging students to design their own microchips with AI voice control as part of the [INVENT a CHIP \(IaC\) competition!](#) For over 20 years, the competition has been reinventing itself in collaboration with the Federal Ministry of Education and Research (BMBF). Tens of thousands of young people have already been reached. The young people are shown the highest level of appreciation. See November 26, 2024: The prizes will be awarded in Berlin at the festive 70th anniversary of the Informationstechnische Gesellschaft im VDE (VDE ITG) by BMBF State Secretary Dr. Roland Philippi, among others.
- **Student competition:** In [VDE's COSIMA competition](#), students develop new microsystems technology applications. Objective: to improve and facilitate the interaction between people and technology in a wide range of areas of daily life. And it has been a success: the winning teams in the competition regularly achieve top results at international level too – see the recent iCANX

conference in Davos, where all four German COSIMA teams achieved top placings.

- **Business festival:** The unique [VDE music event 'bits, bonding, bassline'](#) brought together the world of students and young professionals with the world of business in June 2024. Hundreds came to discuss the industry's future prospects and to make contacts. Whether it was speed dating, company pitches or other formats. The festival sets completely new standards for the classic career fair.
- **School presence:** In mid-July, VDE was able to organize an entire day at the Romain-Rolland-Gymnasium in Berlin under the label [Day of Technology@School](#). More than 1,000 students took part and were able to immerse themselves in the world of electrical engineering and information technology at around 60 different stations – from a knowledge quiz to lectures and workshops to a drone flight. Christina Henke, Berlin's state secretary for education, and district councilor Julia Schrod-Thiel were also in attendance. VDE has also already held the Technology Day@School in Saarland.

VDE Young Net

VDE's Young Net brings together around 3,500 students and young professionals – and is present throughout Germany with a total of 50 VDE university groups.



Save the date

November 26, 2024 in Berlin

[VDE Capital City Forum 2024 & 70 years of VDE ITG with the IaC award ceremony](#)

December 4, 2024 in Berlin

[Microelectronics for Future 2024](#)



VDE website

INVENT a CHIP – STEM student competition



VDE Young Net website

bits, bonding, bassline Festival of Electronics



Article from VDE Policy Brief 3/2023

Sparking enthusiasm among the next generation



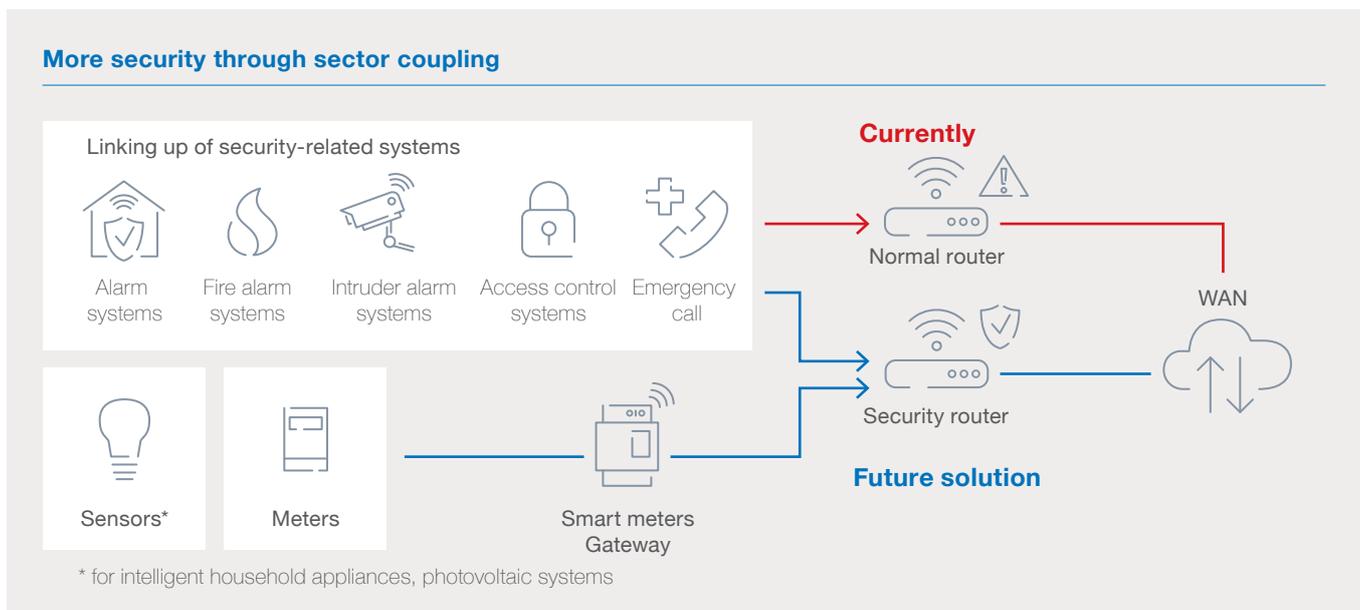
Article from VDE Policy Brief 2/2023

Germany needs more students

Secure routers

Use the interface for other sectors

Germany is currently experiencing the roll-out of intelligent measuring systems, also known as smart meters. They replace the classic electricity meters and are connected to the internet via secure routers that are highly protected against cyber attacks. The aim is to use this cyber security infrastructure for other applications as well and save millions in costs.



Smart metering systems receive data on electricity consumption from photovoltaic systems, electric car charging stations, heat pumps and smart home appliances and can control them at the same time. The systems in turn communicate with metering point operators, electricity suppliers and distribution system operators. To ensure the highest level of cybersecurity, the communication channels are classified as critical infrastructure (KRITIS) and the gateways can withstand even serious cyberattacks using state-of-the-art technology. The German Federal Office for Information Security (BSI) specifies technical rules and updates them continuously.

Integration of emergency call systems, etc.

The secure connections are currently used exclusively in the electricity sector. They could also be used to communicate data from emergency call systems, fire alarm systems or access control systems in companies. The main advantage is that these so-called value-added services could use an established and secure infrastructure at relatively short notice. In addition, there is no need to set up secure router systems for individual applications.

Therefore: Open the gateways from the electricity sector to other sectors in order to reduce effort and costs, to increase the energy efficiency of buildings by means of an IT infrastructure that is as lean as possible, and at the same time to offer the highest level of security.

BSI called upon

In a [white paper](#) sponsored by the Federal Ministry of Education and Research (BMBWF), the DKE, the standardization organization supported by VDE, together with other partners, shows how this sector coupling will succeed. The BSI is now called upon to adapt the technical guidelines for secure routers for value-added services. *der sicheren Router für Mehrwertdienste anzupassen.*



DKE website

Sector coupling with secure routers



Article from VDE Policy Brief 1/2024

Strengthening electricity and communication networks



Article from VDE Policy Brief 1/2023

Smart meters

Clarify the key issues now

Germany is under extreme pressure as an automotive center. New competitors are entering the market, sales figures are falling, and plant closures are being discussed. What matters now for German carmakers is to successfully occupy the future field of electromobility, to join forces and to work with policymakers to develop solutions. VDE's E-MOBILITY CONFERENCE on November 20 and 21 provides the framework for this.

VDE's E-MOBILITY CONFERENCE has developed into a unique platform. What makes the event special in Europe: key players from the automotive industry, charging infrastructure, energy industry and electricity grid operators, as well as leading policymakers, scientists and experts from funding projects come together here to discuss key issues and develop viable solutions.

The topics range from the political framework and questions about digitalization, AI and cybersecurity, battery storage and the transformation of traditional drives to consumer protection and safety.

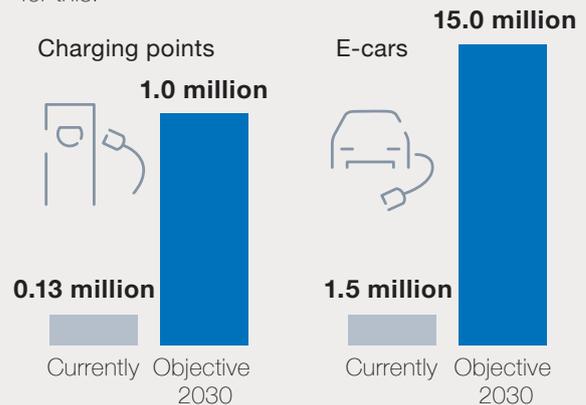
After the great success in previous years, around 150 participants are expected. Under the motto 'Innovations, infrastructure and integration – shaping electromobility,' the conference will feature keynotes, lectures and panel discussions, fireside chats and project pitches. Top speakers and their topics include:

- **Dr. Josef R. Wünsch**, Senior Vice President R&D Performance Materials, BASF: From the perspective of the chemical company, he outlines how materials for the e-mobility of the future must be created. He will highlight the challenges for various material classes and present solutions.
- **Dr. Frederik Zohm**, Board Member for Research & Development, MAN: In March, MAN and ABB jointly charged an eTruck for the first time at an MCS charging station with more than 700 kW and 1,000 A. Within half an hour, the battery went from 10 to 80 percent. What requirements can be derived from this? And what does the perfect interaction of all players look like?

This successful concept is receiving broad support from industry and politics – for example, the German Federal Ministry of Transport (BMDV) is acting as patron for the third time.

E-mobility: picking up speed for 2030 targets

The German government has set ambitious targets for 2030 in terms of electric mobility. Now it is time to pick up the pace in terms of charging infrastructure and fleet growth, and to transfer important lessons learned – for example, on the subject of e-trucks. VDE's E-MOBILITY CONFERENCE provides the framework for this.



Policymakers especially welcome!

VDE's E-MOBILITY CONFERENCE offers policymakers exclusive opportunities for dialog with experts from industry and science. To make it easier for them to attend, policymakers receive free admission – simply send an e-mail to politik@vde.com.

Save the date
November 20–21, 2024,
Frankfurt am Main



VDE website

VDE E-MOBILITY CONFERENCE



Video

Review of 2023



VDE mobility study

Resilient automotive location Germany 2035



Article from VDE Policy Brief 2/2024

Resilient automotive location

VDE – the technology organization



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Facts and figures

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 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 VDE's certification mark:	billions
 Norms and standards:	over 3,500