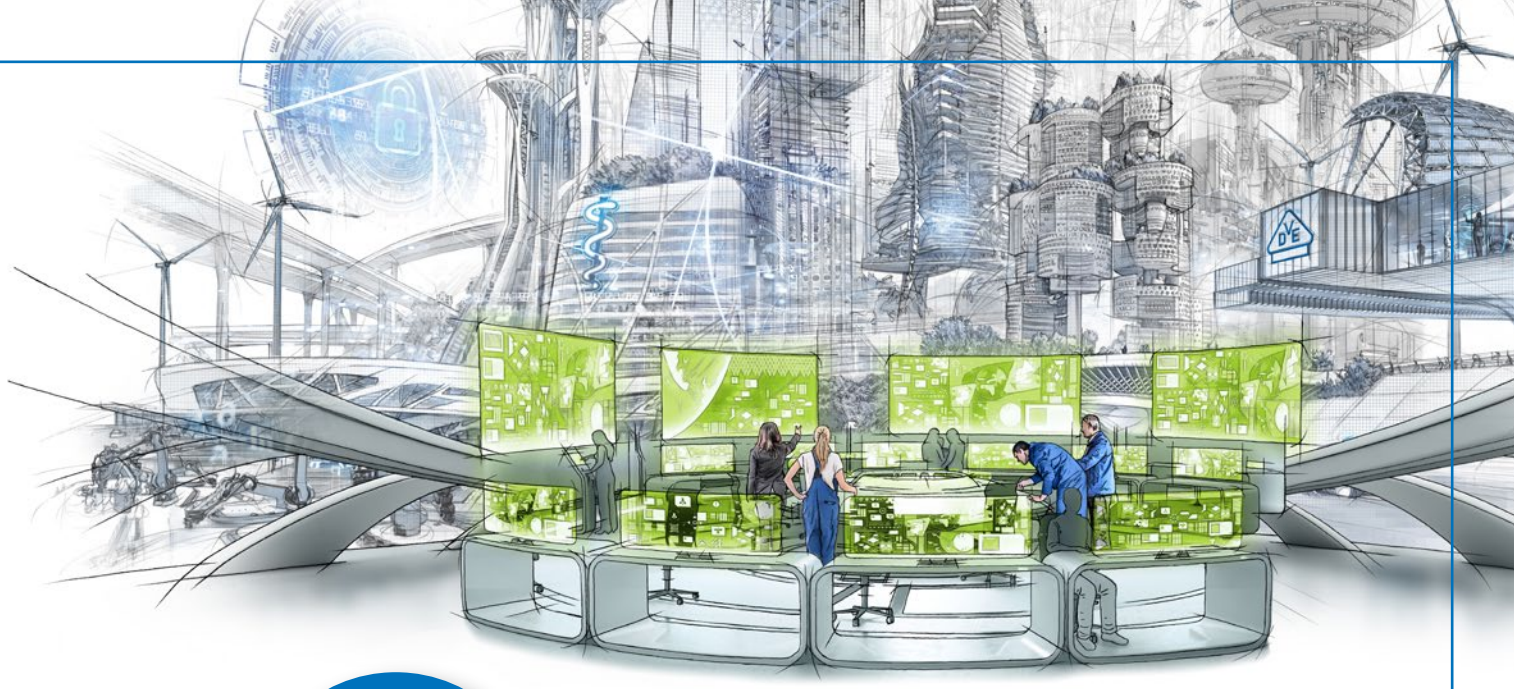
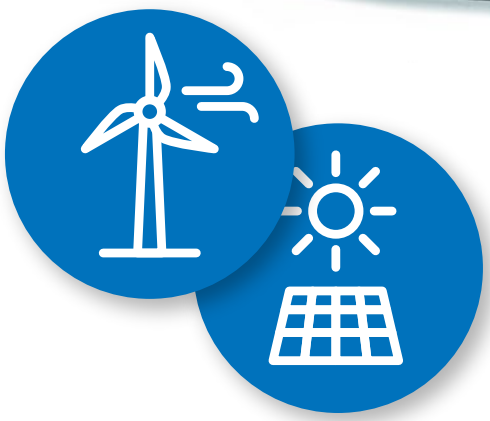




DKE Commitment

100 %

Renewable energies

VDE Policy Brief

Edition 3/2022

VDE Policy Brief online

VDE

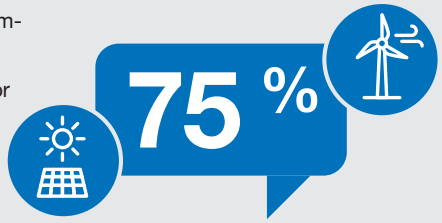
All-electric society

Alternative to the fossil age

No gas, no oil, no coal: The all-electric society will meet its energy needs entirely on the basis of electricity generated on a renewable basis. This is the only way Germany and Europe can become climate-neutral. The DKE is the recognized national standardization organization for electrical engineering, electronics and information technology, and is a reliable partner.

Standards central to climate protection

Among 1,400 companies surveyed, 75 percent call for standardization to drive climate protection.



Source: German Standards Panel, Indicator Report 2022

Solar, hydro and wind power, as well as geothermal energy and bioenergy, will supply Germany with electrical energy in the future. This will force a radical transformation of all sectors, whereby industry, buildings, mobility, infrastructure and energy must all be digitized, automated and electrified. The key idea here is intelligent sector coupling to optimize energy efficiency across systems. Fluctuations in electrical energy generated from wind or sun can be managed through flexible and coordinated consumption and the use of storage. A highly complex task that is only conceivable at all through global standardization.

In mid-August 2022, the standards organization DKE, which is supported by the VDE, made a commitment to consistently align its activities with the All Electric Society. It will drive the topic forward in specific terms at three levels:

- **Networking:** The DKE establishes a cross-stakeholder dialog and coordination platform for standardization on the all-electric society – independent and neutral!
- **International solutions:** The all-electric society requires far-reaching agreements at international level. The DKE will push this important process and advocate accordingly in the global standardization organization International Electrotechnical Commission (IEC) – thus strengthening the innovative power of the German economy at the same time.
- **Product portfolio:** The DKE will create so-called SMART standards on a digital basis. This will enable users to implement sector coupling in a timely and value-adding manner as quickly as possible.

DKE Innovation Campus

At the end of June 2022, the DKE explored the prospects of the all-electric society with around 400 experts as part of the Innovation Campus. Including Stefan Schnorr, State Secretary at the Federal Ministry of Digital Affairs and Transport:

“The DKE is a guarantor that we can make our way to the all-electric society. Sustainability and climate neutrality are impossible without standardization.”

G7 conference on standardization and climate protection

At the beginning of September, the German Federal Ministry for Economic Affairs and Climate Action (BMWK) held a multi-stakeholder conference as part of Germany’s G7 presidency. Topic: Standardization as a strategic tool for greater climate protection On the part of the DKE, President Roland Bent, among others, gave a keynote speech.

DKE participants: Lea Emmel, Nadine Petermann, Michael Teigeler, Roland Bent, Florian Spiteller, Johannes Koch and Alena Widder (from left to right) during the G7 conference.

DKE Commitment 2030
All Electric Society

Website
DKE

Article from the Policy Brief, issue 2/2022
Energy system 2030

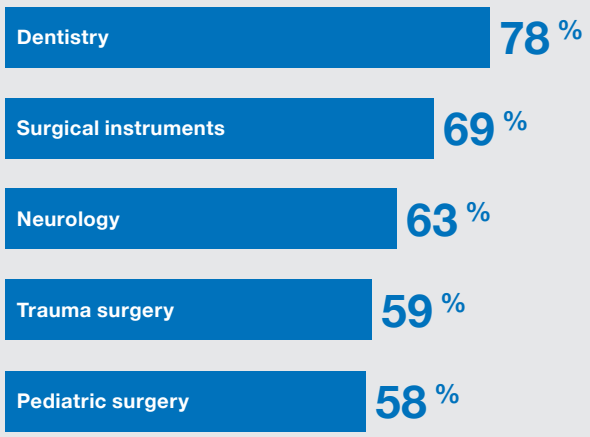
Medical devices

EU regulation threatens supply

In addition to exploding energy costs, Germany's hospitals are increasingly suffering from a lack of medical devices. Particularly concerning is the supply of so-called balloon catheters, which newborns with heart defects urgently need. The EU Medical Devices Regulation (MDR) is responsible for this shortage. In a current position paper, the VDE outlines key solution options.

MDR catapults thousands of medical devices out of supply

Proportion of medical device manufacturers by selected application areas that are discontinuing individual products, product lines or entire product ranges due to the MDR



Source: Joint survey by DIHK, Medical Mountains and SPECTARIS, May 2022

Since the end of May 2021, the MDR has regulated how medical devices may be placed on the market in the EU. The requirements have been tightened significantly and in many cases lack clarity. The documentation effort has increased massively. Small and medium-sized manufacturers as well as start-ups have a particularly hard time under these conditions. According to estimates, the MDR implementation costs for the German medical device industry alone amount to 7 to 10 billion euros. Numerous companies will go bankrupt or stop selling essential medical devices. Particularly in the SME sector, innovation is at risk of dying out.

Averting total disaster

The MDR is already jeopardizing supply. The situation will continue to worsen, with the MDR transition period expiring at the end of May 2024. Around 18,000 existing medical devices will then have to be recertified, even though they have been proven safe. To avert the impending disaster, the VDE has formulated 32 recommendations for action. The three most important topics are:

- **Expand capacities:** There is a significant bottleneck of approved certifiers; the so-called notified bodies. The EU Commission is called upon to shorten notification times and comprehensively enable remote audits – instead of on-site inspections.
- **Simplify certification of existing products:** So-called rolling review procedures make it possible to fulfill documentation obligations step by step instead of submitting all information in advance of an approval application. This approach should definitely be opened up to existing products: The products could continue to be marketed during the procedure and the notified bodies could be relieved.
- **Improve clinical evaluation of existing products:** The MDR has significantly increased the requirements for clinical data. They represent a huge hurdle for established existing products in particular. What is needed is a realistic approach to documentation requirements and, if necessary, an extension of transition periods beyond May 26, 2024. In addition, manufacturers – one and a half years after the MDR came into force – must finally receive clarity regarding numerous detailed requirements.

VDE position paper
Recommendations for implementation

Website
VDE DGBMT

Article from the Policy Brief, issue 3/2021
Maintain sovereignty in biomedical technology

Fuel cells for trucks

Reducing costs through standardization

Heavy-duty and long-haul freight transport urgently need fuel cell drives if they are to achieve climate neutrality. Essential for this are higher volumes through series production and falling costs. The VDE demonstrates options which at the same time strengthen Germany as a high-tech location.

There are still considerable gaps in the standardization of fuel cell drives. How should the interface between fuel cell and battery be designed? What requirements must subsystems for supplying the electrics fulfill, and how is safety to be ensured?

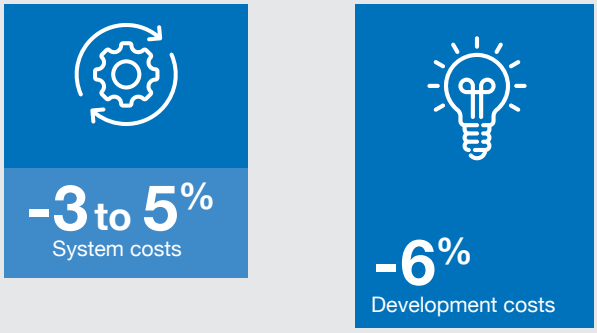
Standardization now!

Questions of principle of this kind must be clarified in order to optimize research and development processes and establish cost-effective series production. The potential is there: According to the latest VDE study – sponsored by the German Federal Ministry for Economic Affairs and Climate Action (BMWK) – standards alone can reduce development costs by around 6 percent by 2025. Rapid standardization is thus good for more climate-friendly heavy-duty transport.

What's more, those who set norms and standards at an early stage enjoy an important advantage in international competition. The clearer the rules, the faster approval processes, testing and certification take place. Other study findings:

- **Expand funding programs:** Fuel cells are currently primarily produced outside Europe. In order to catch up, a joint research and development offensive by politics, business and science is required.

Standardization:
Savings potential for fuel cells by 2025



- **Further develop research networks:** The intensive dovetailing of science and industry in joint research projects and funding programs must be extended to the field of fuel cell technology – this is the only way to maintain the leading role of the German (automotive) industry.
- **Targeting standardization loopholes:** The focus of standardization should be on the interfaces between fuel cells, battery and electric motor. The interaction of individual components must be optimally coordinated.

VDE E-Mobility Conference

Over 30 keynotes, presentations and open panel discussions, top speakers from politics, business and science: the VDE E-Mobility Conference on October 25/26, 2022 in Frankfurt drives forward visions of the future and offers a very special setting for networking. The patron is the Federal Minister for Digital and Transport, Dr. Volker Wissing.

Tickets and information at
https://e-mobility-conference.vde.com/de

Website
VDE Mobility

VDE Study
Fuel cell systems in e-mobility

Article from the Policy Brief, issue 1/2022
Push for low-CO_2 drivetrains

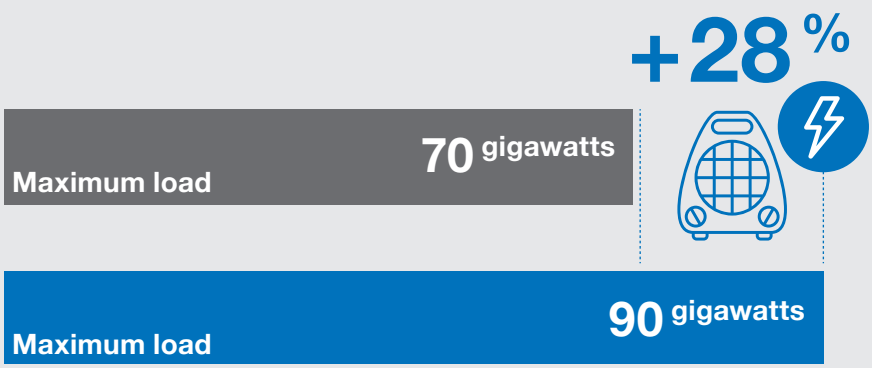
Article from the Policy Brief, issue 2/2021
Drive technologies and energy concepts

Direct electric heaters

No alternative to gas heating

Russia's war of aggression against Ukraine threatens energy security. Gas prices are reaching unimagined heights, while heating is becoming hugely more expensive. In search of alternatives, thousands of consumers are turning to mobile electric direct heating devices such as fan heaters or radiators – a massive threat to power grids in an emergency.

Impending peak load not bearable



About half of the approximately 40 million German households currently heat with gas. If every second household were to operate just one electric heater with a typical output of 2,000 watts – despite the fact that there are often several running at the same time – the additional electrical load would be around 20 gigawatts.

DIY stores report an increase in sales of direct heating devices of up to 100 percent compared with the previous year. A further increase in demand is to be expected, especially as the devices are considered to be inexpensive – many people, however, are not aware of the enormous strain they place on the power grids.

Threat of power outages

The fact is that the power grid is not designed for numerous fan heaters to be operated simultaneously in individual streets or neighborhoods. In cases of uncertainly, what is known as overload protection kicks in, resulting in a power outage for the entire street or neighborhood. This would also make it very difficult to restore the power supply: Only after as many of the affected consumers as possible have actively taken their fan heaters off the grid would a stable power supply be possible again. The network operators are powerless here, as they cannot switch off the fan heaters independently – unlike heat pumps or night storage heaters. Consumers need to be educated now! Without electricity, it will then be difficult to operate in an emergency.

But the hype surrounding direct electric heaters must also be countered from a consumer protection perspective:

- **Enormous operating costs:** According to current calculations, the additional costs compared to gas heating for an 80 square meter apartment are 3,600 euros per year. Heating with direct appliances is not worth it – it is an enormous false economy!
- **Special protection:** In light of the filling gas storage facilities, a gas emergency for the coming winter seems unlikely at present. In addition, private customers are specially protected by law – they will receive a reliable source of gas.

Raising savings potential

So what to do? As banal as it sounds, heating costs are best reduced by means of lowering room temperatures and reducing waste. Even one degree less reduces energy consumption by six percent. In addition, consumption can be effectively reduced, for example, via online control of radiator thermostats and by optimizing gas heating at an early stage.

VDE press release
Still using gas heating

FAQ
Heating with electricity

Website
VDE ETG

European chip law

Addressing the shortage of skilled workers

Microchip production is the basis for Europe's technological sovereignty. Only those who have comprehensive know-how of the entire production chain can successfully address future issues. The EU Commission shares this view and wants to lay the foundations with the chip law. The key is to set the right priorities.

With the chip law, the EU Commission wants to mobilize public and private investments amounting to 43 billion euros. The success of the chip law will not fail for lack of money. Critical to success, however, is the dramatic shortage of skilled workers: In Germany alone, the demand for electrical engineers is more than twice the number of graduates. The EU and its member states need to do more than they have in the past to provide incentives and explore options that do not restrict free thought. Examples:

- Target funding for energy/electrical professions instead of treating all STEM subjects equally
- Use the budgets of public film funding and the support of ARD and ZDF to produce a hit series – with a heroine or hero from electrical engineering
- Showing young people the impact of electrical engineering and finally increasing the proportion of women studying the subject to an acceptable level.

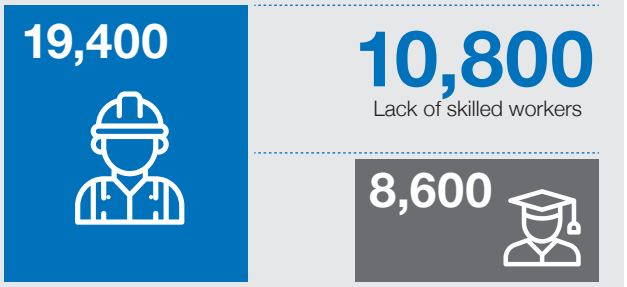
NIn addition to fighting the shortage of skilled workers, two other important tasks are developing a roadmap that encompasses all players along the microchip value chain and establishing a funding system that is both designed for the long term and, at the same time, enables quick decisions.

MICROELECTRONICS FOR FUTURE

The VDE specifically seeks to engage in a dialog with policy-makers. For example, on November 8, 2022, the technology organization, together with the ZVEI, will be hosting the Micro-electronics for Future summit not far from the Reichstag in Berlin's Futurium. High-profile experts will shed light on quantum technology and its groundbreaking innovation potential. The event will be preceded by the award ceremony for the Invent a Chip competition for school students – a VDE initiative sponsored by the German Federal Ministry of Education and Research (BMBF).

Who should develop and produce microchips?

Overall demand for electrical experts versus the number of graduates in 2022 in Germany



Source: IW Cologne, microcensus, Federal Statistical Office; VDE calculations

The VDE has been committed to the domestic microchip industry for years and highlights the importance of the technology in numerous brochures. See Smart Grid: The energy transition is forcing a complete transformation of the current power supply. Wind power, photovoltaic and biomass power plants must be intelligently integrated – which requires the mass use of microchips. See autonomous driving, where the mobility of the future is set to massively change behavioral patterns and living spaces. Germany has a good chance of benefiting from this – provided the companies know something about microelectronics. See medical assistance systems: High-tech systems already enable unimagined precision in surgical procedures and make everyday life easier for many people. The development is rapid – and is driven by the quality of microchips.

Website
VDE ITG

Website
VDE GMM

VDE position paper
Hidden Electronics III

Article from Policy Brief, issue 3/2021
Preserve Europe's technological souvereignty

Article from Policy Brief, issue 1/2022
Inspiring young people

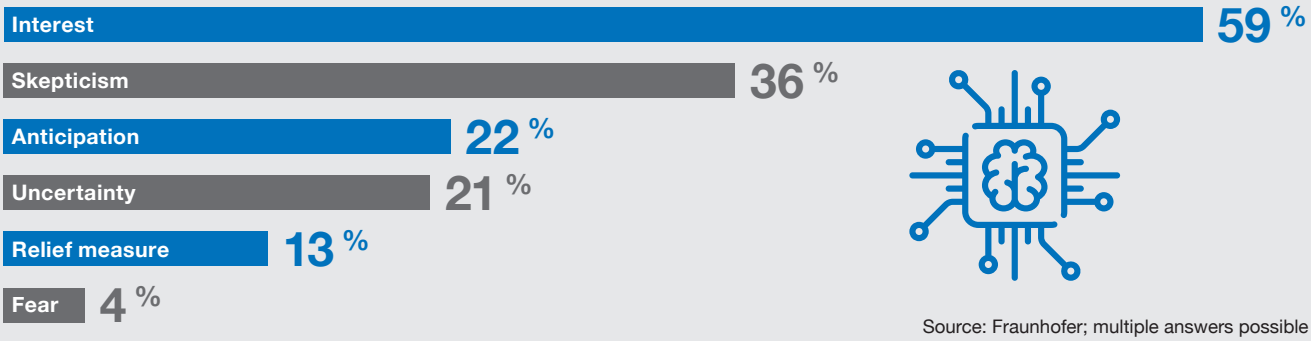
Human-machine interaction

Setting the framework now

Be it engineering, IT or skilled trades, the shortage of skilled workers will continue to worsen. Digitalization and, in particular, human-machine interaction offer the opportunity to mitigate this effect. The prerequisite is that the framework conditions for this are sensibly designed.

Ambivalent feelings

"How do you feel about the idea of working with artificial intelligence and robots in the future?"



Source: Fraunhofer; multiple answers possible

New technologies are changing our working world. Artificial intelligence (AI) and smart devices can recognize work tasks and act independently. For German companies, their use means greater efficiency and flexibility with higher quality. This secures advantages in international competition. At the same time, older or impaired people can participate in working life for longer and their know-how, which is sometimes irreplaceable, is retained. The new working from home options would also be inconceivable without digital solutions.

However, the technological change also poses challenges for employees: On the one hand, they are being relieved by smart assistance systems; on the other, they are relinquishing part of their job and must learn to operate and accept new systems. On the labor market, this requires a boost in qualifications.

VDE Ddives HMI topic forward

The VDE HMI expert group has already been bringing together key players since 2018: startups, SMEs and corporations, as well as science and policymakers. This is the prerequisite for making digital success projects "Made in Germany" around the topic of human-machine interaction an export hit.

Standards, legislation and support measures must be used to create an environment in which the potential of HMI can be exploited to the full:

- **Developing qualification measures:** Companies are required to provide employees with appropriate qualifications for new digital jobs. To this end, the VDE has developed scenarios on and through the machine – taking into account technological, psychological and legal aspects. Practical webinars for skilled workers are being prepared. The qualification offensive must be pushed politically.
- **Clarifying legal issues:** Robots and AI algorithms act on the basis of data – but who is liable in the event of errors? How can occupational safety be ensured when using VR glasses? Laws and regulations must provide answers to these questions. The VDE HMI expert group would be happy to discuss this with policymakers.
- **Expanding norms and standards:** Existing norms and standards must be expanded in order to ensure humans and machines can continue to work together safely and successfully. At the same time, new standards are needed for new technologies, among other things. The VDE expert group on human-machine interaction has identified the need.

Website
VDE Human-machine interaction

VDE – the technology organization

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Publisher
VDE Verband der Elektrotechnik
Elektronik Informationstechnik e.V.
Merianstraße 28
D-63069 Offenbach am Main
Germany

Legal notice
www.vde.com/en/legal-notice

Editorial deadline
21 September 2022

Agency partner
Köster Kommunikation
GDE | Designing communication

Facts and figures

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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 VDE mark:	**billions**
Norms and standards:	over **3,500**