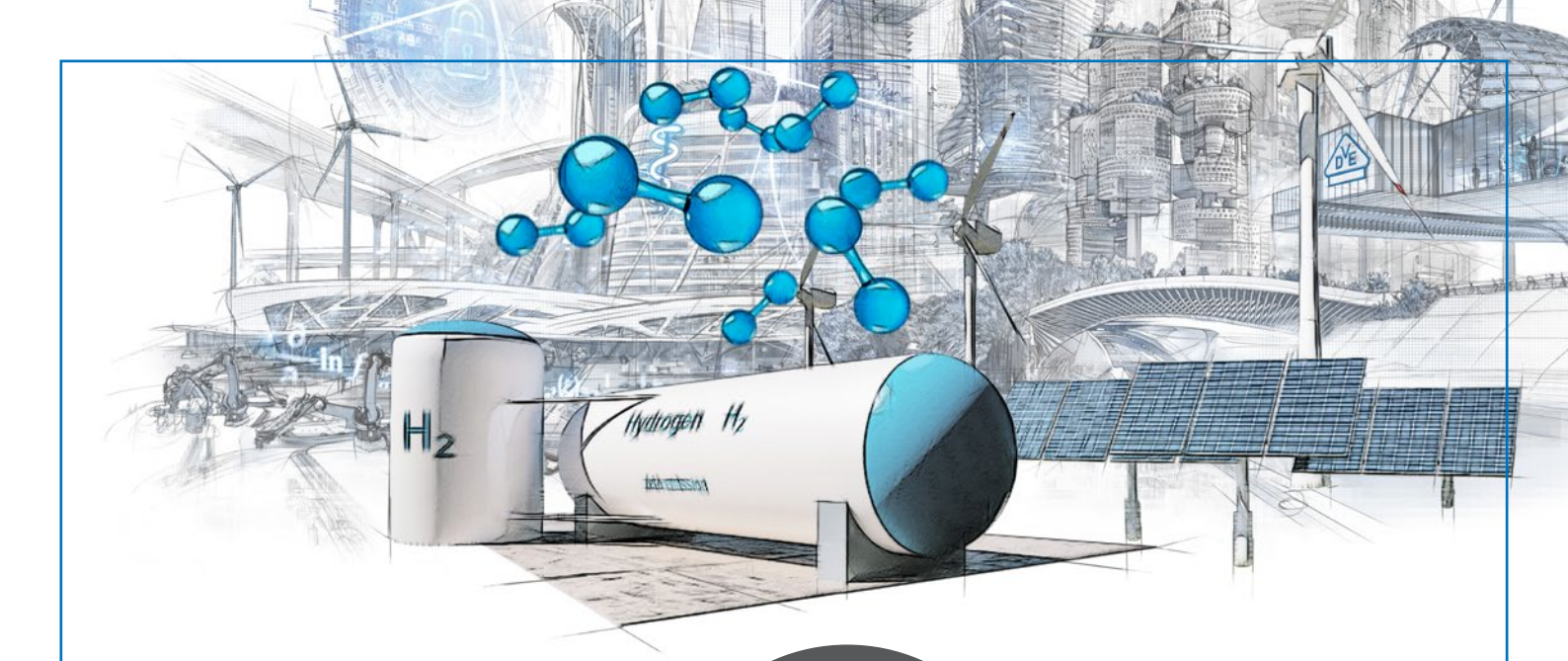


REPowerEU: reduce dependency on Russian energy as soon as possible

Europe must become independent of Russian energy imports. At the beginning of March, the EU Commission presented a plan to achieve this. It will be possible to offset around two-thirds of Russian natural gas imports as early as the end of 2022 – the VDE is on hand to discuss the specific technical implementation.

155
billion m³
natural gas

imported into the EU from Russia in 2021

102
billion m³
natural gas

can be offset by the end of 2022

VDE Policy Brief

Edition 1/2022

VDE Policy Brief online

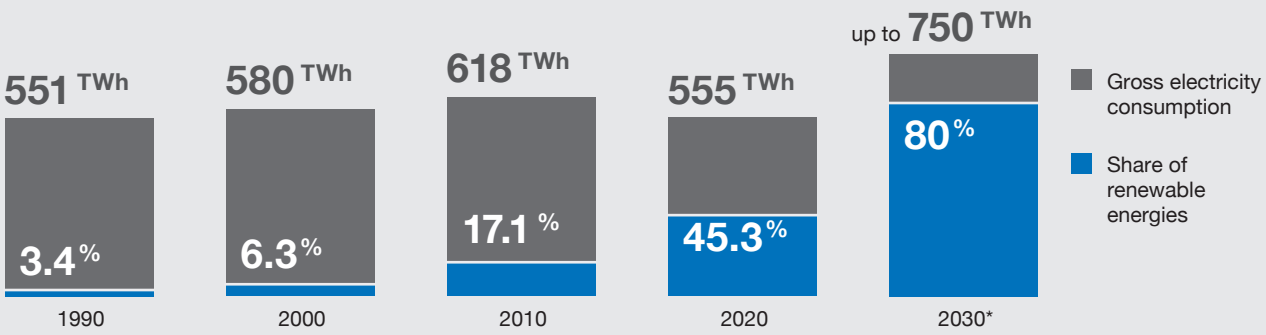
VDE

Energy strategy

Act now!

The war of aggression against Ukraine ordered by Russia's President Putin emphasizes that Germany must reduce its dependency on Russian gas as soon as possible – not least to ensure a secure and sustainable energy supply.

Gross electricity consumption and share of renewables in Germany 1990 – 2030



* Projection; sources: Federal Environmental Agency on the basis of AG Energiebilanzen; Federal Ministry for Economic Affairs and Climate Action

In the fall of 2021, the VDE published recommendations for an energy strategy aimed at the massive expansion of renewable energies – the equivalent of freedom energies. The recommendations are more current than ever:

- **Expanding renewables:** In principle, the potential of wind and solar energy in Germany is sufficient for a power supply based entirely on renewable sources. They complement each other seasonally and in combination can successively replace fossil fuels. The expansion targets for wind and solar must be raised.
- **Secure gas supply:** The secure supply of gas and subsequently hydrogen requires reliable strategic reserves. In addition, supply sources must be diversified and transport routes guaranteed.
- **Secure power supply:** At the same time as the coal phase-out, electricity generation must be sufficiently plannable and flexibly available. In a transitional phase, these are gas-fired power plants without Russian gas, with a view to decarbonizing them with green hydrogen in the future.
- **Provide reliable framework conditions:** Planning certainty is key to medium- and long-term renewables expansion. If market incentives are not sufficient, accompanying regulatory measures must be taken.
  This also applies to incentives to increase energy efficiency in all sectors.
- **Make direct use of RE surpluses:** Flexibly connectable loads such as e-cars can absorb surplus power as part of sector coupling. Battery and pump storage are available as short-term solutions, for instance day-night balancing and the provision of balancing power.
- **Pursue targeted use of green hydrogen:** Climate-neutral hydrogen should be used primarily in those sectors of industry and transport that cannot use renewable energy directly. It is also suitable as long-term storage for larger and longer-term power surpluses.

Energy system of the future – secure and affordable

The market and framework conditions must facilitate economic business models in a decentralized, regenerative electricity supply. This is currently not the case. The VDE is currently developing proposals for the right incentives and remains at policymakers' disposal for the purposes of maintaining a dialog.

VDE Position
Sustainable energy strategy

Website
Energy technology society in the VDE (VDE ETG)

Lessons from Putin's war in Ukraine

Strengthening resilience

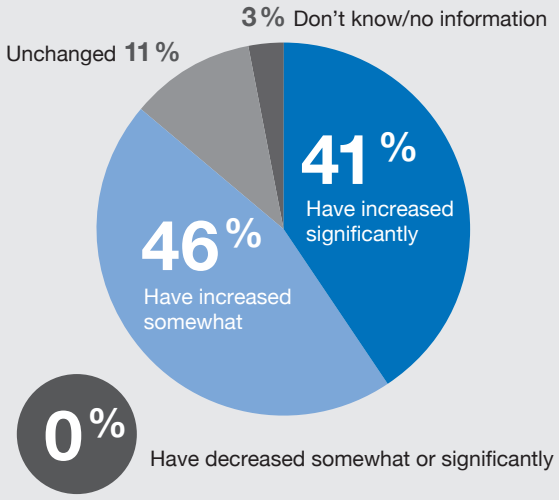
Putin's war against Ukraine is also an attack on Europe's freedom. Aside from the military aspects, Germany must be able to fend off cyberattacks and disinformation campaigns, as well as attacks on critical infrastructure and communication channels, Chancellor Olaf Scholz said when addressing the government on February 27, 2022. The key term is technical resilience – always a core issue for the VDE.

Digital vulnerability is omnipresent. In January 2022, Ukrainian government websites were paralyzed, including those of the emergency services. German ministries and authorities at all levels, as well as members of the German Bundestag, are regularly under attack. In the case of the latter, the damage was so severe in 2015 that consideration was given to replacing the Bundestag's entire IT system. In the economy, total losses amount to 220 billion euros per year – and this figure is sharply on the rise. What does the state need to do to increase resilience?

- **Technological sovereignty:** What level of sovereignty should be achieved in key technology fields? The VDE has developed a methodology for this, which also includes security policy considerations and economic benefits. The main political tasks include pushing research and teaching in the field of electrotechnology – and increasing the attractiveness of the degree.
- **Power and communications networks:** In the short term, both sectors must strengthen their resilience. In the medium term, mutual dependencies must be considered and interests clarified. The VDE can act as a balancing facilitator for an overarching resilience approach.
- **Trusted Information:** Social bots are increasingly being used for social manipulation. To protect the democratic formation of opinion, "authentic pseudonyms" show us the way. They preserve a minimum of anonymity online and at the same time exclude bot posts on online platforms. The VDE is a global pioneer in this area.
- **Cyber security:** In line with the coalition agreement, the German government urgently needs to further develop its cybersecurity strategy, providing targeted support for small and medium-sized enterprises in particular. Key elements are also standardization and certification. These topics are among the core tasks of the VDE, and the technology organization makes its expertise available at all times.
- **Future scenarios:** Imagining various hazard scenarios helps to identify weak points at an early stage and develop alternative courses of action. Stakeholders from industry, politics and society must be involved – the VDE can bring them all together.

CRITIS increasingly under pressure

Development of cyberattacks in CRITIS sectors according to companies' assessment over the past 12 months



Source: Bitkom Research 2021
Not equal to 100% = rounding inaccuracies

VDE Recommendation
Resilient power and communications networks

VDE Impuls
Resilience of electricity and gas supply networks

VDE Position paper
Technological sovereignty

Website
VDE Artificial Intelligence

Website
Energy technology society in the VDE (VDE ETG)

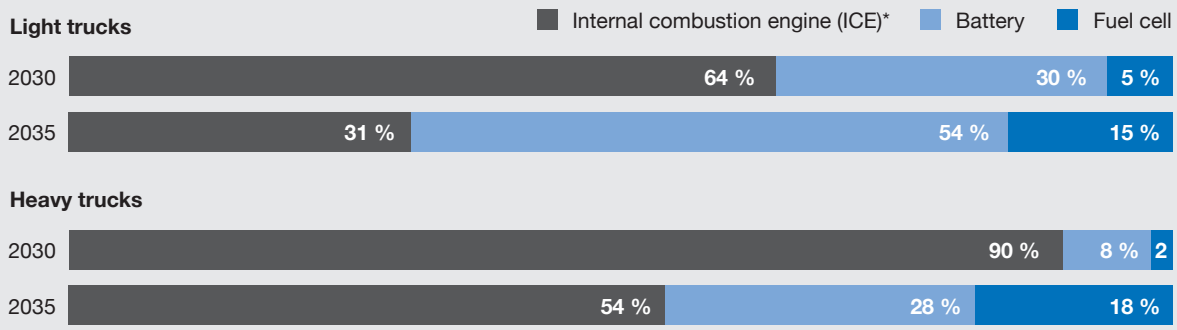
Website
Information technology society in the VDE (VDE ITG)

Commercial vehicles

Push for low-CO_2 drivetrains

While sectors such as energy or industry have been able to reduce their CO_2 emissions over recent decades, emissions on the roads have increased significantly. Commercial vehicles (CVs) are of particular importance: trucks, buses and vans account for around 38 percent of CO_2 emissions in EU road traffic.

Climate-friendly drivetrains gain massive market share in Western Europe



* incl. synthetic fuels and hybrids

Source: J. Neuhausen et al.: Making zero-emission trucking a reality. Truck study 2020: Routes to decarbonizing commercial vehicles. Strategy& 2020

According to EU regulations, CO_2 emissions from heavy and light commercial vehicles must fall by around 30 percent by 2030 compared with 2019/20 and 2021 respectively. The German goal of achieving climate neutrality by 2045 can only be achieved if heavy and light commercial vehicles also use renewable energy sources. In a joint study, the VDE and VDI have for the first time outlined technology paths to achieve this. The core message is that in the long term, diesel will also be replaced by electric drivetrains in commercial vehicles. Depending on the required range, vehicle weight and user behavior, the focus is on battery technology solutions (BEV) and fuel cell systems (FCEV).

How should policymakers push the switch to carbon-neutral drivetrains?

- **Support market introduction:** In order for fleet operators such as freight forwarders to invest millions, they must firstly be able to rely on a sufficient number of hydrogen refueling and charging stations. The corresponding infrastructure must be expanded. Second, financial incentives are an important means of generating leverage. In particular, longer-term exemption from tolls or tax incentives might be conceivable.
- **Promote competitiveness:** The logistics industry is highly competitive and internationally oriented. Since climate-neutral commercial vehicle drivetrains will remain relatively expensive for the time being, policymakers must strengthen their competitiveness. In particular, the EU should harmonize tax and legal structures in the transport sector and prioritize climate friendliness.
- **Support user acceptance:** Logistics operators want to maintain the familiar usage options of their vehicle fleets. In particular, it must be possible to integrate loading or refueling operations into the prescribed driving times. In order to reconcile range, user behavior and economic efficiency, research into batteries and hydrogen tank systems with higher energy densities should be pursued more intensively.

VDI/VDE Study
Climate-friendly commercial vehicles

Article from the Politikbrief, issue 2/2021
Drivetrain Portfolio of the Future/Mobility 2030

Website
VDE Mobility

Website
VDE Electromobility

Website
Energy technology society in the VDE (VDE ETG)

Uniform requirements with norms and standards

The economy in Germany and Europe is to be made more digital and sustainable. One key to this is the Digital Product Passport (DPP). Through it, product information for industry and consumers can be accessed digitally at any time. With existing international standards in the field of industrial automation, the standards organization DKE, which is supported by the VDE, already provides a suitable framework for industry so that the DPP can be implemented consistently.

Tailwind for increased sustainability

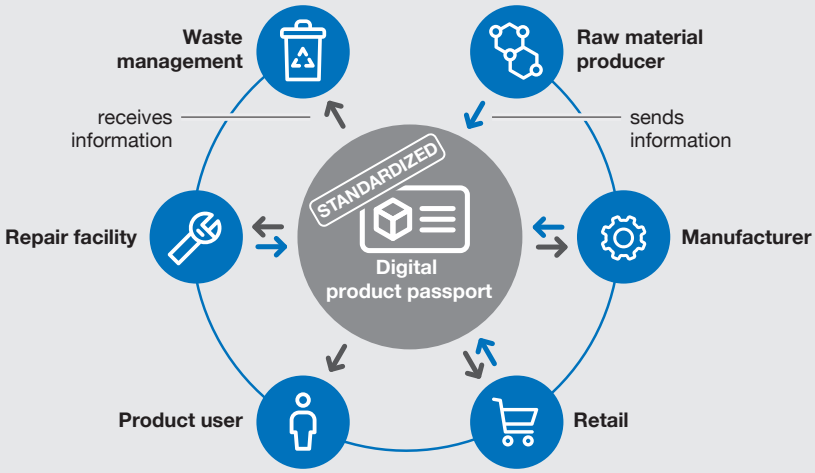
The need for us to sustainably transform our economy is intensifying at an alarming rate. Manufacturers often lack information on whether for instance prefabricated imported parts meet sustainability criteria. Consumers lack transparency. The DPP is intended to solve this deficit: It will soon be possible to read the social and ecological footprints of products via smartphone. Policymakers want to exploit this potential. The EU Commission is calling for the DPP as part of the circular economy action plan and the ecodesign directive, and the German government is also backing it.

Involve industry at an early stage

The implementation of the DPP raises numerous questions: What data can actually be collected? How can reliable and cost-efficient processes be designed across all industries? In what way can the special requirements of small and medium-sized enterprises be taken into account? Here, the business community must be involved at an early stage so that the right answers can be found. Norms and standards are central to the DPP. This is the only way to create maximum reliability and fair competitive conditions.

How the digital product passport works

The requirements for data formats and interfaces of a DPP must be standardized and allow easy data processing. Data must also be secure, reliable and machine-readable.



The DKE coordinates crucial standards

This is precisely where the DKE comes in: In close collaboration with the key sectors of mechanical engineering, electrotechnology and information technology, the DKE is already developing essential standards for the DPP. In the Industrie 4.0 (SCI 4.0) standardization council, the DKE coordinates standardization together with the leading associations and companies and systematically shares information on concepts and use cases. In addition, the European standardization organization CENELEC – under the presidency of the DKE's Managing Director Wolfgang Niedziella – is driving the issue forward at European level.

Website
The DKE

Website
The DKE: Digital Product Passport

Technology expertise throughout Germany

Volunteer work shapes VDE e.V.

Politicians regularly emphasize the importance of volunteering. The focus is then on soccer clubs, shooting clubs and volunteer fire departments. Rightly so! But volunteering goes far beyond that – just look at the VDE.

The VDE is a driver of technology throughout Europe: its nearly 30,000 members – from research, science and academia as well as from small family businesses and corporations – determine the fate of the independent technology organization. On a voluntary basis, the experts address key issues without pursuing their own interests. Instead, the focus is on non-profit. For over 125 years. VDE technical societies are of particular importance in this respect:

Technological sovereignty, mobile communications 6G: The information technology society (VDE ITG) pools the knowledge of 10,000 information technology experts for essential topics of technological sovereignty. Current issues are addressed in more than 80 expert committees.

Sustainable energy transition, thermal energy transition, and sustainable mobility transition: With over 12,000 members, the energy technology society (VDE ETG) is essentially the spiritus rector of sector coupling. Together with the ITG, the ETG is developing a comprehensive paper on resilience that the federal government will be able to take into consideration in its planning. The issue has been high on the political agenda since Putin's attack on Ukraine.

Purpose of the statute

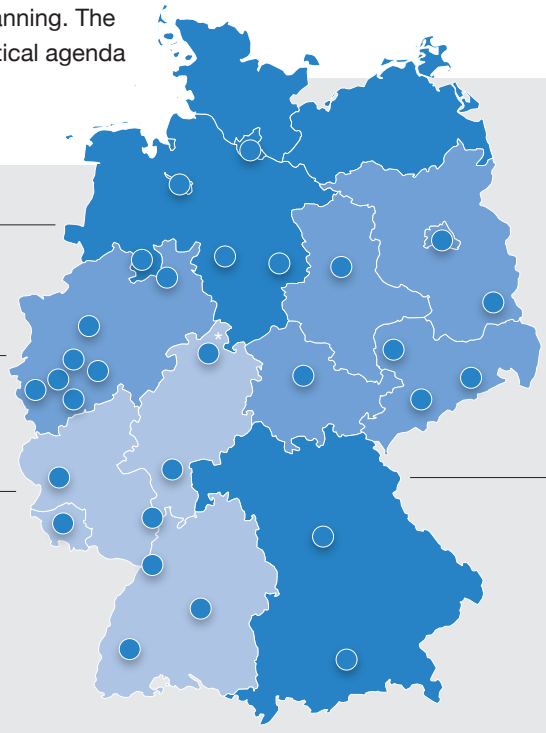
The VDE's essential purposes are to promote science, research, teaching, and contributions towards general safety and consumer protection, as well as to support technical-scientific and socio-political discussion. The VDE is a neutral advisor in matters of technologies.

Hidden Electronics II and III: The VDE/VDI microelectronics society (VDE GMM), together with the ITG, has highlighted the importance of memory chips for Europe's technological sovereignty – and in so doing has co-initiated the EU Chip Act.
9,500 members are involved in seven specialist areas and around 45 specialist committees.

Sovereignty in biomedical technology: With more than 2,500 members, the German society for biomedical technology (VDE DGBMT) is the largest scientific and technical society in medical technology and addresses future topics such as the use of AI.

Knowledge for every Bundestag constituency

The VDE offers policymakers technical and scientific expertise and contacts in almost every constituency.



Hanse region
Matthias Konen

Western region
Daniel Rinkert

Southwestern region
Dr Kevin Rick

Eastern-central region
Ralf Berger

Southeastern region
Peter Rief

VDE district associations

For policymakers seeking to make contact with the VDE on site, please email: **politik@vde.com**

Electrotechnical studies

Inspiring young people

Fewer and fewer young people are studying electrotechnology. The problem is that key issues such as technological sovereignty, the energy transition, e-mobility, digitalization and Industry 4.0 can only be mastered with electrotechnical know-how. Policymakers and society must take countermeasures with new concepts.

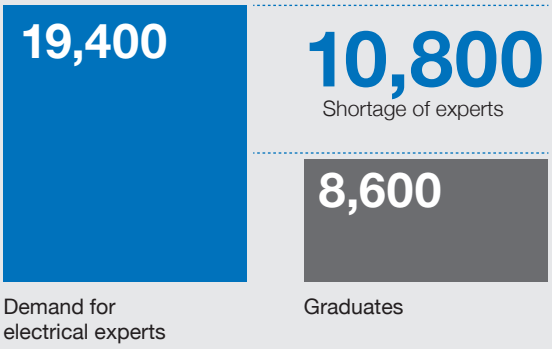
According to the VDE's latest study, Germany needs over 19,000 electrotechnicians a year – but only 8,000 or so will graduate each year over the coming years. This is something that has been becoming increasingly problematic for years now. Back in 2011, around 5 percent of first-year students opted to study electrotechnology, in 2021 only 3.5 percent opted to do the same. In the same period, the proportion of those who fail to complete a degree in electrotechnical studies after having started rose from 48 percent to 62 percent. The situation is becoming untenable!

Policymakers must come up with appropriate incentives and explore options without hindering rational thought. Possible approaches include:

- **Differentiate STEM more strongly:** For years, policymakers have been spending considerable resources on promoting so-called STEM subjects. This should be prioritized based on requirements – according to the STEM report of the German Economic Institute (IW), the biggest bottlenecks are in the energy/electrical professions.
- **Appealing to the imagination of the next generation:** Fictional films and series provide important stimuli for career choices. For example, the crime series CSI has increased interest in forensics as a field of study, and the sitcom The Big Bang Theory has increased interest in chemistry, physics and biology. Why not a hit series focusing on electrotechnology nerds? Policymakers have creative influence via ARD and ZDF and the multi-million budgets of public film funding.
- **Providing basic information in an attractive way:** According to young people, the job portals of the Federal Employment Agency lack basic elements – user-friendliness, networking options, playful elements and target-group-specific presentation of content. StickTo, the social network for career guidance, shows how it can be done.
- **Reaching women – leveraging potential:** As at the start of the semester, the proportion of women studying electrotechnology is 17 percent. Even in mechanical engineering and civil engineering, the proportion is 23 percent and 28 percent respectively. Policymakers must help uncover stereotypes and, wherever possible, show girls and young women the impact electrotechnology has on climate protection – studies show that such aspects motivate women in a special way.

Shortage of electrotechnicians

Overall demand for electrical experts vs. graduates in 2022



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

VDE Commitment

The VDE is committed to attracting more young people to electrotechnology. Two examples for this are the technology organization VDE together with the BMBF, which have been addressing high school students for more than 20 years with the Invent a Chip competition. Students and young professionals from VDE faculties have access to networking opportunities via the VDE Young Net and are able to implement their own projects as evidenced by the future project Earth 2250.

VDE Study
Press release on the job market 2022

Policymaker representatives and media representatives will be sent the study **free of charge**. Please send an e-mail to markusb.jaeger@vde.com

Website
VDE Study, Career and Society

Website
INVENT a CHIP competition

VDE – the technology organization

Your contact

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Facts and figures

Founded:	**1893**
Employees:	worldwide **2,000**
Members:	almost **30,000**
Volunteer experts:	more than **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**

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