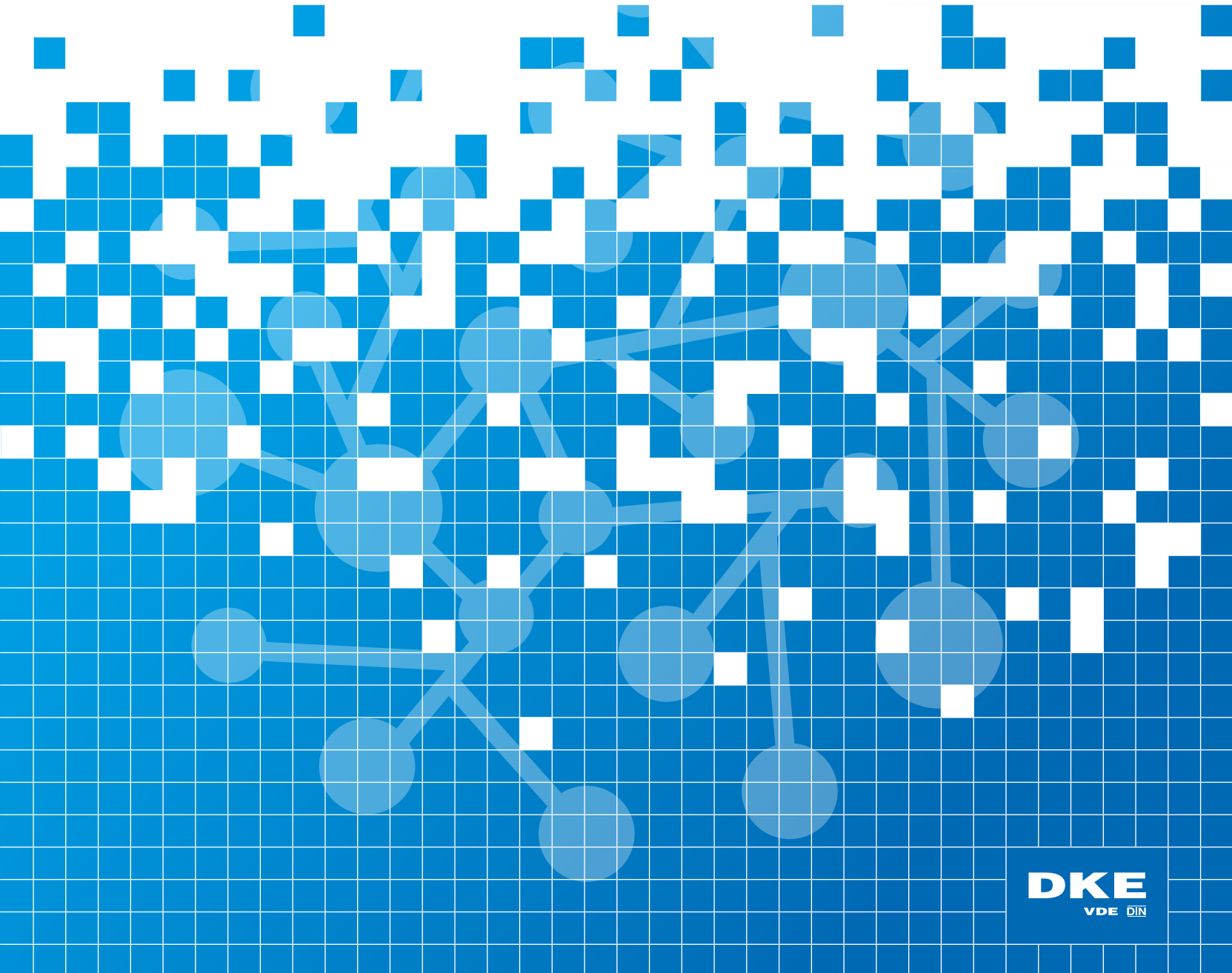
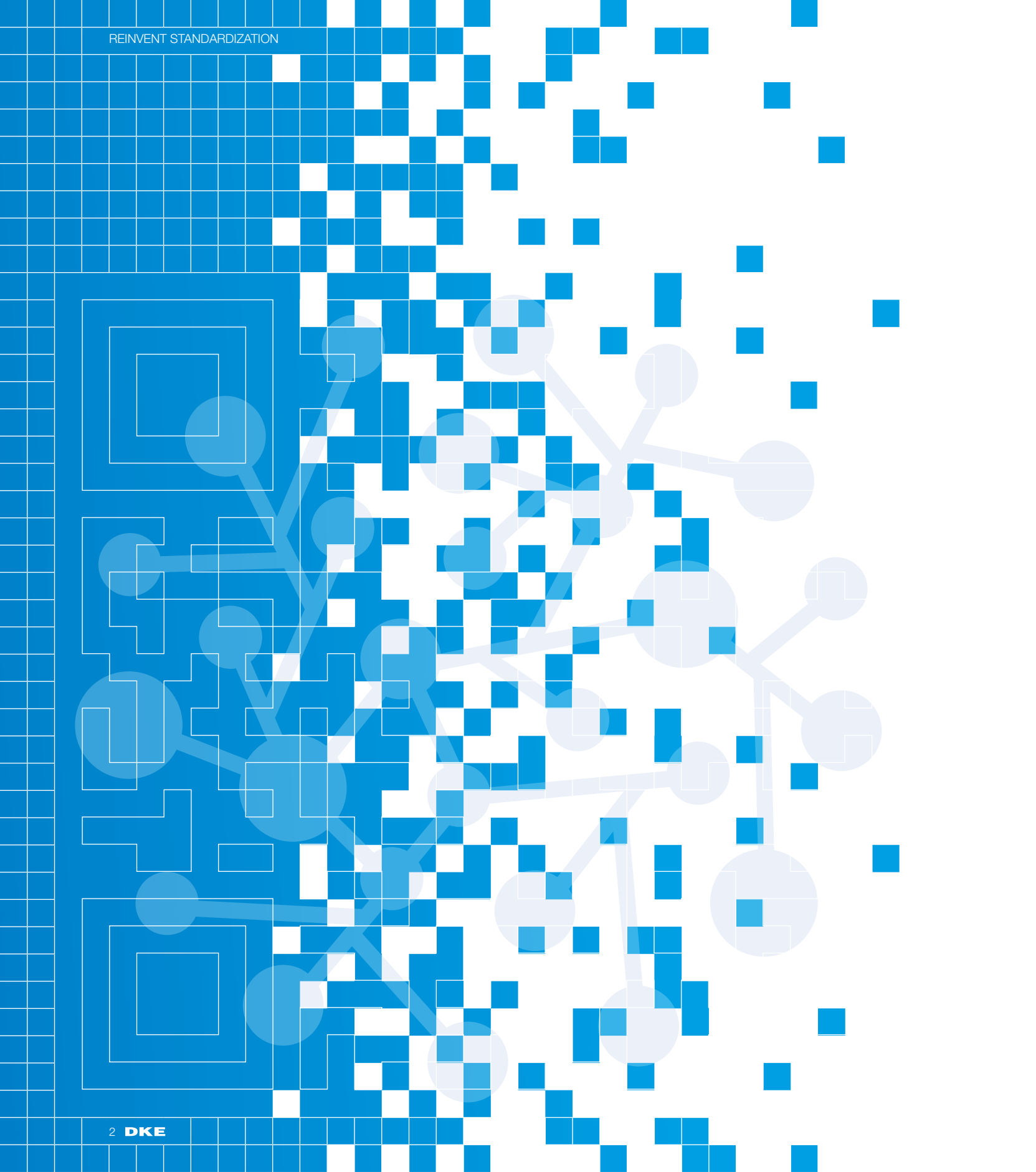
REINVENT STANDARDIZATION
ANNUAL REPORT 2016



DKE
VDE DIN



REINVENT STANDARDIZATION **6**
DIGITAL TRANSFORMATION OF STANDARDIZATION 8

STANDARDIZATION SUCCESSES **12**
ENERGY 14
HEALTH 18
MOBILITY 22
INDUSTRY 28
HOME & BUILDING 34
BASIC FUNCTIONS 36
COMPONENTS & TECHNOLOGIES 40

CONNECTING COMMUNITIES **42**
EVENTS 44
PERSONNEL/AWARDS 48
SERVICE 54

> *www.dke.de/Jahresbericht2016*
(also available in the app)

"I see the 80th IEC General Meeting as the dawn of a new era of standardization."

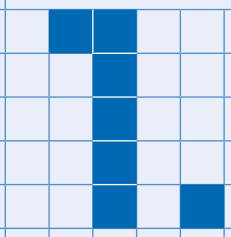
Roland Bent, President of the DKE Council

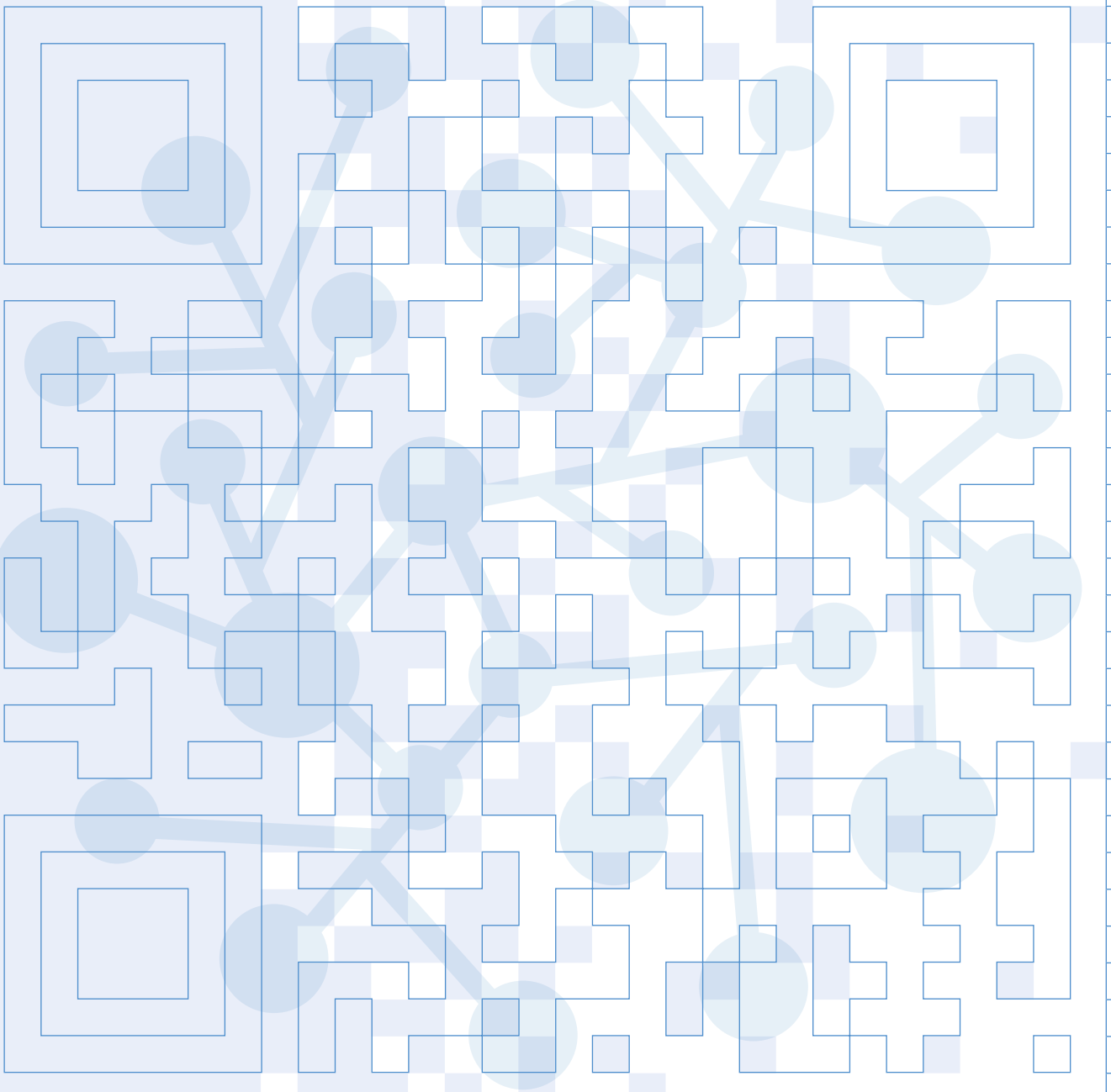
"Standardization must reinvent itself and strike out in new directions if it is to gain further significance."

Michael Teigeler, DKE Board of Directors

"The theme of the IEC General Meeting and the ReInvention lab came as a pleasant surprise to many - which was our intention."

Dr. Bernhard Thies, DKE Board of Directors





THE DIGITAL TRANSFORMATION IS WELL UNDERWAY: REINVENT STANDARDIZATION

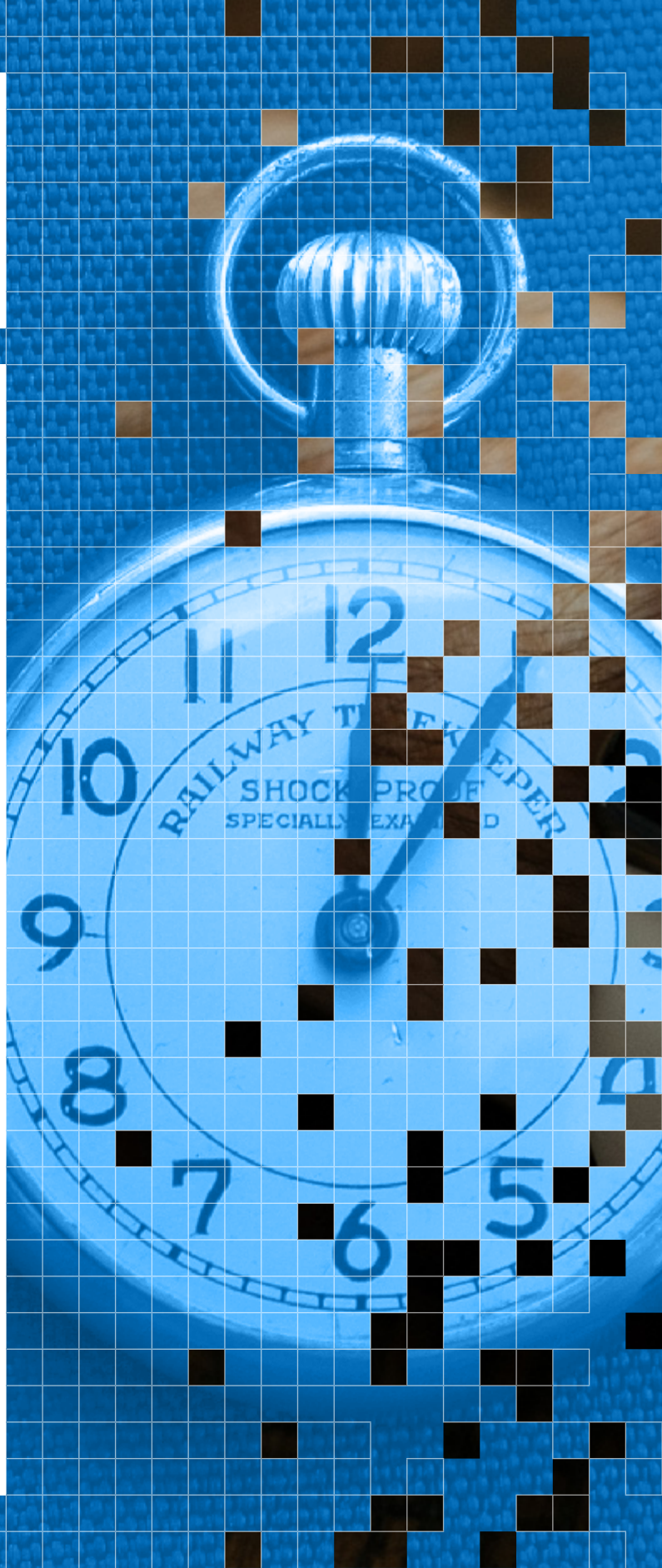
1.

DIGITAL TRANSFORMATION OF STANDARDIZATION - CONCRETE STEPS

The content of standards is being influenced more and more by digital issues, but standardization itself is also expected to undergo further digitalization in the next few years. In 2016 a number of pilot projects were successfully presented by the DKE at the IEC General Meeting in Frankfurt. For two years now, the DKE and its experts have been working on a vision for the standardization of the future in the “Standardization 2020“ programme.

OBJECTIVES

Standardization processes should become faster, more efficient and of greater quality - for the standardization experts, the standards users and for the DKE itself. It should be easier to access the content and it should be presented to standards users in a more individualized form through complementary services in terms of “standards as a service“.



SPECIFIC IMPLEMENTATION INITIATIVES

Examples of standard generation and usage process represent concrete first steps in implementing the “Standardization 2020“ vision.

Collaborative editor for committee work and virtual meetings

In a pilot project, IEC committees were invited to test a collaborative editor for their work on standards. Users can carry out Web-based work simultaneously on the document. All changes are visible and trackable. A variety of comment functions simplifies and accelerates the asynchronous and hitherto mostly offline exchange of views. The complete development history is documented at the same time. In particular, the test users called the collaborative features of the editor ‚pioneering‘. Further aspects were also deemed to be useful, e.g. the fact that this new form of collaborative work must be accompanied by new, ongoing standardization processes which achieve the desired result without interruptions and thus faster. The pilot project also included the example of a virtual meeting created by means of virtual reality and an augmented reality presentation (display of digital content in a real environment).

THE “DIGITAL TWIN“

The standard itself is digital, yet it is still intended for use by people. What the experts and the standards users desire is a machine-readable standard. Here the DKE joined forces with industry partners to present the “Digital twin“ project at the IEC General Meeting. The content of standards is stored in the engineering system, and can thus be incorporated directly in the development and checked for compliance. Clear demands were also made by users in the Reinvention Laboratory (a new format proposed by the DKE) during the IEC General Meeting: “I would like to download the standard directly to my device.“ Standards content should be directly usable - e.g. in engineering tools, test equipment or testbeds.

COMPUTER-BASED TRANSLATION: TRANSLATION MEMORY

An important and labour-intensive step of standardization in Germany is translation of the English content prior to publication as a German standard. The DKE cooperates with translation service providers that use a so-called translation memory system, overseen by the DKE. The resulting translation memory compares sentences and sentence segments with existing and previously translated content. Known content is used directly and need not be translated again. The aim is to reduce translation costs and to improve translation quality in the medium term.

XML AND CONTENT MANAGEMENT SYSTEM

Preparations are currently being made in all standards organizations to convert standardization content to XML. The objective is to achieve seamless processing of standard content across all media and to be able to use it directly in the various new publishing channels. The DKE has initiated a pilot project for this and linked it directly to the planning of an XML-based content management system.

ONLINE STANDARDS LIBRARY

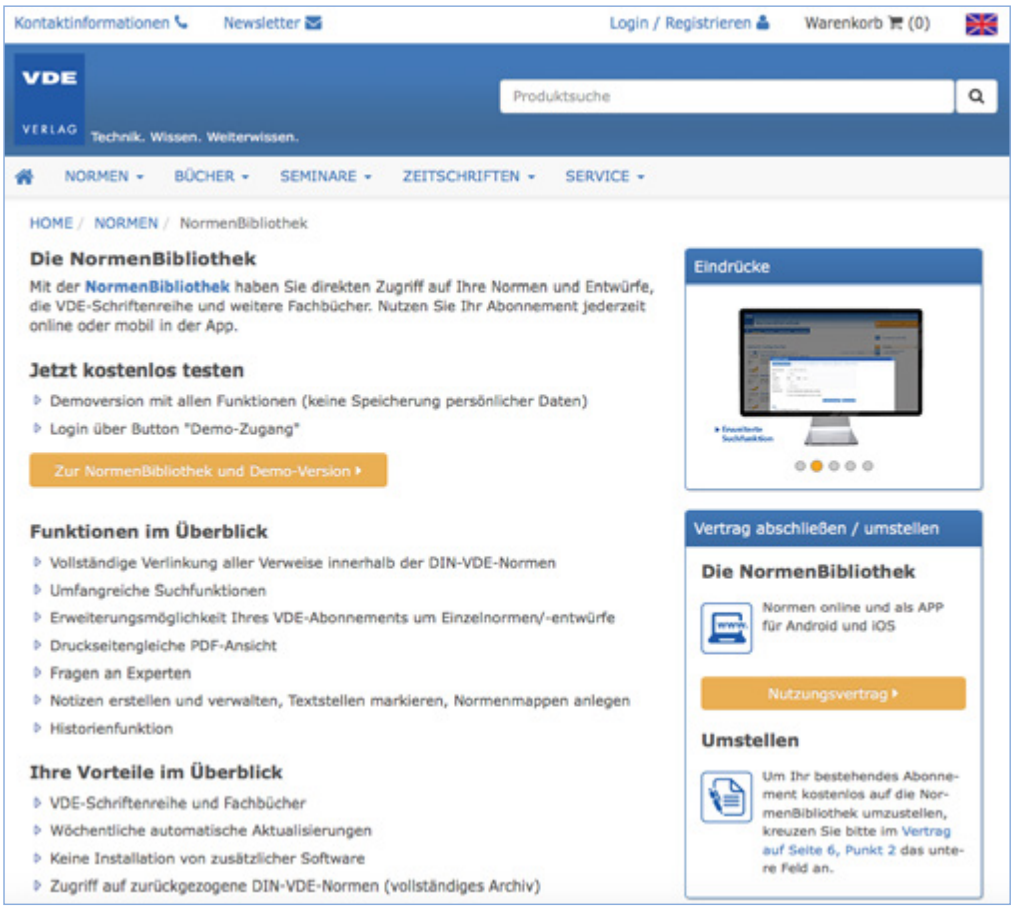
For several years the VDE publishing arm has been offering the fully digital online use of standards, including many additional features in the standards library (> *standards library*). Use of the portal is to be further simplified early in 2017 and supplemented with an app for accessing standards information quickly on a mobile device. Drafts are also available digitally and free of charge in the drafts portal of the VDE publishing arm.

OUTLOOK

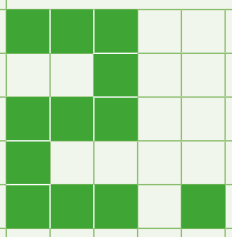
Conversion to an XML-based content management system (planned for 2017) will be the basis for further ways of making standards content available in modular form and thus faster and easier for standards users to access. Additional services for experts in the committees as well as for standards users can be implemented on the basis of this system.

The pilot projects presented at the IEC General Meeting will be continued and incorporated in the work with our partner organizations DIN, CENELEC and IEC.

Please send any suggestions and feedback to *johannes.stein@vde.com*.



> *https://www.vde-verlag.de/normen/normenbibliothek.html*



FROM MANUAL WORK TO MORE ROOM FOR CREATIVE PROCESSES: STANDARDIZATION SUCCESSES

ENERGY
HEALTH
MOBILITY
INDUSTRY
HOME & BUILDING
BASIC FUNCTIONS
COMPONENTS & TECHNOLOGIES

2.

WHITE PAPER ON THE BSI PROTECTION PROFILE

The Smart Meter Gateway (SMGW) communication unit with integrated security module is the central component in smart meters. The tasks of the SMGW include consumption data transmission, self-administration and communication with various components and market players. The protection concept of the Federal Office for Information Security (BSI) describes the minimum requirements for appropriate security measures: the BSI Protection Profile.

But what does the BSI Protection Profile mean in daily use? The planned white paper on the BSI Protection Profile provides answers, takes stock of the HAN-CLS interface (HAN: Home Area Network; CLS: Controllable Local System) and, of course, includes an overview of possible future developments. In it, the “Smart Home and Metering“ expert group (DKE/AK 901.0.2) gives detailed requirements for the technical layer regarding use of the infrastructure, and an overview of the gateway and ICT infrastructure. It examines the opportunities and risks in detail.

The white paper adopts an open perspective and also covers in some detail the non-regulated part of the energy industry, whereas the practical part describes the various requirements for the structure of a channel to various devices such as a heating control system or a mobile device. The white paper gives an overview of the current national and international groups and standardization activities such as the CENELEC Smart Meter Coordination Group or the IEC “Smart Energy“ System Committee. Finally, it offers a glimpse into the future by analyzing the interaction between the non-regulated parts of the energy sector and the regulation-based infrastructure over the next few years.

INVERTER MODELLING FOR STATION AUTOMATION SYSTEMS

The increasing integration of renewable energy sources has triggered growing demand for intelligent, highly flexible control of power grids. Linking the interfaces between the applications and control systems is one of the main challenges here.

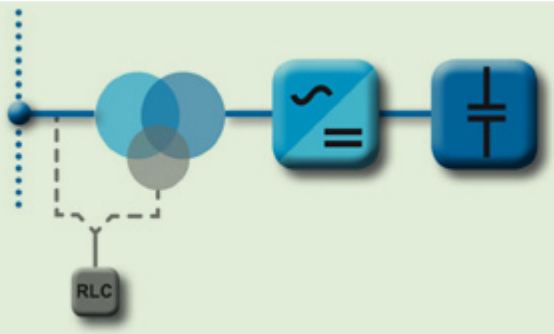
Many power electronic components and systems (such as static frequency converters, rectifiers for railway power applications and public networks or high voltage DC transmission systems (HVDC)) are controlled by external network control technology. This is why these systems are integrated into station automation systems and linked using different communication protocols.
The DKE “Communication and Modelling“ (AK952. 0.10) smart grid expert group has generated a common, consistent communication solution based on the “Communication networks and systems for the automation of electrical energy supply“ (IEC 61850) series of standards for existing power converters and flexible AC transmission systems (FACTS).
The report covers more than 80 pages and describes the seamless integration of power inverters and FACTS in the station automation systems. Manufacturers and users have specified a functional data model for this. The generic modelling approach supports all power inverter and FACTS applications, resulting in a huge reduction in complexity without loss of functionality.

>

The detailed documentation (free of charge) illustrates the application of the data model. In addition, a DKE webinar presents the results of the extensive work and provides a glimpse into current and future power electronic applications in the energy supply in relation to IEC 61850.

> *www.dke.de/ergebnisdokumentation-umrichtermodellierung*

INVERTER MODELLING WITH IEC 61850



GRID PLAYERS - STORAGE FACILITIES AS SYSTEM SERVICE PROVIDERS

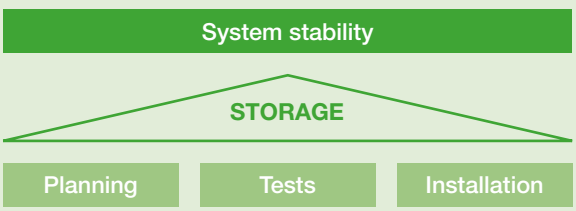
Up to now electric energy storage systems (EES systems) have been used to provide a temporary balance between generation and consumption in the electrical power production system which is increasingly prone to fluctuation. Thus they compensate the disadvantage of renewable energy sources of their not being able to produce demand-based energy - unlike conventional power plants.

What is new is the role of the storage providers as systems service providers. They are particularly well suited to this on account of their high degree of flexibility. In addition to the pure balancing function of the EESs for energy and power, they can also make a major contribution to system stability with appropriate methods and rules. Test procedures are currently being developed which are designed to help monitor the extent to which EES systems can provide the required system service in continuous operation.

The rules, methods and tests for such storage systems are developed by the “Electrical Energy Storage Systems“ (DKE/UK 261.1) expert group. Their objective is to describe the EES planning methods. Network planners, EES system manufacturers and users as well as developers and operators EE systems benefit from the rules.

The purpose of the new rules is to provide all players with reliable instructions on how to dimension EESs to match their local environment. As part of the international standardization efforts, the aim here is to cover a wide range of situations - from pure performance-based integration to the delivery of highly dynamic system services.

GRID PLAYERS



“LIFE CYCLE ASSESSMENT FOR FUEL CELLS“

The use of fuel cell technologies represents an innovative basis for efficient and clean energy production in diverse fields. Fuel cells offer far-reaching application possibilities for flexible power supply: in stationary applications for the distributed energy supply of buildings, as well as in mobile applications.

Life cycle assessments (LCAs) are suitable means of meeting the environmental compatibility requirements of installed system components. Generally an LCA aims to be as comprehensive as possible with regard to the life cycle phases considered (construction, operation and dismantling of plant) and the relevant environmental aspects (use of resources such as metals, ceramics, water, fuels, etc. and emissions into soil, water and air). An assessment is made of the potential impact of these environmental aspects e.g. in terms of climate change, toxicity, acidification, ozone depletion, or scarcity of resources.

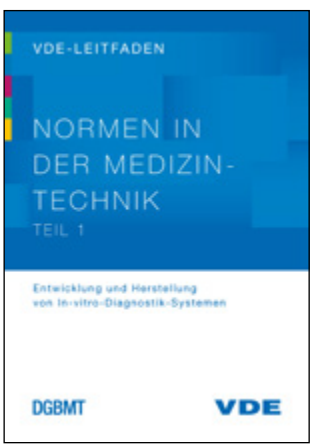
In the standardization of LCAs, it makes sense for this to be based on the environmental declaration - e.g. according to ISO 14025 “Environmental labels and declarations - Type III Environmental declarations - principles and procedures“. This requires so-called Product Category Rules (PCRs), developed at the international level. These include not only fuel cells, but also any form of micro combined heat and power systems designed for domestic use. In addition, the amount of CO2 emitted during the use phase and the processing of precious metals in the manufacture of fuel cell stacks are also to be addressed. The resulting standard proposal is to be officially put to the vote in the coming weeks as a New Work Item Proposal.

2.

VDE GUIDELINE: PART 1 OF THE “STANDARDS IN MEDICAL TECHNOLOGY“ SERIES

Standards play a special role in market approval for regulated markets such as medical engineering. Small and medium-sized enterprises and start-ups often lack a basic understanding of what standards are relevant for their product, how standards are created and how they should be applied. Although numerous seminars are offered on medical device law, participants only learn that the presumption of conformity applies to the legal requirements regarding the application of harmonized standards. Against this background, a DGBMT (VDE) group of experts has developed the “Standards in medical technology Part 1 - Development and manufacture of in vitro diagnostic systems“ guideline, published by VDE Verlag. In vitro diagnostics (IVD) play an important role in medicine because they provide important analysis results for the diagnosis of diseases, e.g. from the blood of patients. The practical guide encourages readers to consider the relevant standards during the development stage. The relevant standards for IVD are presented, and numerous references are given in the form of additional guidelines, technical reports or websites. The guide also explains why manufacturers should actively participate in standardization work themselves. The response to the guide revealed that there was a clear need for this type of publication: it was the first to build a bridge between inexperienced users and the relevant standards.

The same concept is also being used in a guide to “Medical Software“ by a new group of authors. As far as the regulators are concerned, medical software can exist either as a part of a medical device and/or as a stand-alone product. “Medical apps“ in the form of stand-alone software are currently the topic of much discussion because not all products in the market meet with the legal requirements. Moreover, the European regulatory framework is currently being changed for medical devices and in vitro diagnostic devices, which is also resulting in new requirements for medical software. There are therefore good signs that the next medical software guide will also be a success.



> *www.vde.com/vde-leitfaden_ivd*

EXPOSING ILLICITLY TRANSPORTED RADIOACTIVE SOURCES

The unauthorized or unintentional transportation of radioactive substances in the form of radioactive sources and contaminated waste metal has become a problem of growing significance. Radioactive sources that are no longer subject to statutory monitoring, so-called “orphan sources“, have frequently caused serious radiation exposure and extensive contamination.

Although the illicit transportation of fissile nuclear material and other radioactive substances is not a new phenomenon, worries have been increasing about a “black“ nuclear market over recent years - particularly with regard to its terrorism potential.

The DKE experts are tackling the problem in three ways:

- The devices used for tracing the sources must meet stringent requirements with respect to the detection of low-level radiation. The DKE has published the relevant type tests in the VDE 0493-3 series of standards.
- Officials must proceed in a prescribed manner when inspecting vehicles and cargo at checkpoints. The DKE has published relevant guidance in DIN ISO 22188.
- The devices must be calibrated using appropriate sources to ensure that they can detect the radioactive sources reliably. The DKE has published recommendations for the radiation sources to be used in DIN IEC/TR 62971 (VDE 0412-2971):2016-06.

1


2

1 Truck arrival and departure monitoring at a steel works
Source: Thermo Fisher Scientific Messtechnik GmbH, Erlangen)

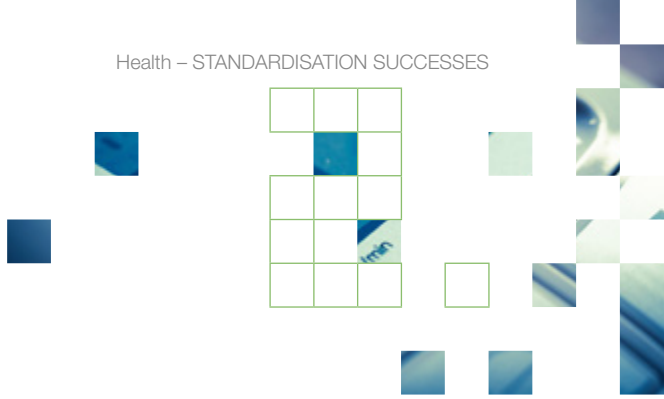
2 Fixed monitor at a national border
(Source: Thermo Fisher Scientific Messtechnik GmbH, Erlangen)

3 Parcel sorting facility with built-in monitors
(Source: IEC Central Office, Genf)

4 Truck arrival and departure monitoring at a steel works
(Source: Mirion Technologies (RADOS) GmbH, Hamburg)


3

4



WEARABLES

Electronic devices carried on the body, so-called wearables, are a topical issue in the technology sector. In Germany the best-known examples so far have been activity trackers and smart watches. Yet wearables now exist in a wide variety of forms ranging from jewellery, socks, insoles, plasters and clothing equipped with sensors. This is not a new idea, however. People have long been wearing micro-computers in the form of a watch on their wrist or of a hearing aid behind the ear. Recently, miniaturization and wireless communication technologies have been developing rapidly, enabling new types of devices. The possible uses of these range from lifestyle and health through to work and safety.

The purpose of wearables is typically to give active or passive support to the users by providing data captured by the sensors of the device. An activity tracker, for example, collects data on the users‘ movement profiles. This data is then evaluated either in the device itself or in an application on a different device, often a smartphone. The users then receive pre-defined information on their movement status through notification functions. For example, users can be prompted to run a few more steps if the current number of steps is below the target value.

Unlike devices that require users to interact with the device, wearables can even support users when they are no longer capable of responding. For instance, wearables can send a signal to a designated third party if a user suffers a heart attack, or if a firefighter becomes unconscious while on duty. The function of being able (at an early stage) to use data to detect events that the users themselves are unaware of, or only perceive to a partial extent, holds great promise in terms of disease prevention and management. Wearables now exist, for example, for the early detection of epileptic seizures and asthma attacks, or in the form of smart socks that can help patients with diabetes mellitus to prevent diabetic foot syndrome.

However, if the full potential of wearables is to be exploited, the reliability and quality of the data, as well as data protection, must be guaranteed, as must product safety. Added to these are new challenges such as the washability of textiles equipped with sensors and electrical components. The current need
for standardization has been recognized by the International Electrotechnical Commission (IEC) and a strategy group devoted to the subject of smart wearable devices was set up in summer 2015. The result was a recommendation to establish a new Technical Committee for the international standardization of “Wearable Electronic Devices“. This recommendation was complied with and the founding of the new Technical Committee initiated at the 80th General Meeting of the IEC from 10 to 14 October 2016 in Frankfurt.

EMOSTAR²K PROJECT - SUPPORT FOR ELECTROMOBILITY THROUGH STANDARDIZATION, COORDINATION AND AWARENESS RAISING

To achieve the National Electric Mobility Development Plan's goal of making Germany the leading market and leading supplier in the field, it was decided by the Federal Government to support general coordination measures and appropriate accompanying action in a joint project. In the EmoStar²K support project (launched in July 2016 and scheduled to last for 3.5 years), the DIN, VDE/DKE and VDA|NAAutomobil have joined forces to support the Federal Government's goal through standardization.
The declared aims of the project are to raise acceptance levels and to establish a common platform for all stakeholders as a means of furthering German interests. This is to be achieved by strengthening public communication. Further project objectives include:

- implementation of the German Electromobility 4.0 standardization roadmap,
- rapid deployment of research and development project results in the standardization process, as well as those of secondary and impact studies,
- rapid identification and inclusion of new standardization topics,
- establishment of strategic alliances and
- support of German SMEs.

VDE|DKE supports the project with its expertise in the field of electrotechnical standardization, in particular in relation to charging interoperability as well as the development and refinement of standards in the field of energy storage. To date, for example, the VDE has subjected its “DC charging with high current for road vehicles“ application guide to a public enquiry procedure and published it. In addition, the “Technical guide on charging infrastructure for electromobility - Version 2.0“ has been completed and published.

The joint project was presented for the first time in November 2016 at the “Electromobility Interconnection Conference“ (Vernetzungskonferenz Elektromobilität) in Berlin. The project attracted a great deal of interest, was featured as part of a public tour and was represented by an exhibit in the outdoor area.

EmoStar²K

DELTA PROJECT
THE FUTURE BELONGS TO ELECTROMOBILITY

An important prerequisite for electromobility is that it must be comfortable and safe. The joint “Data security and integrity in electromobility for charging and billing in conformity with calibration law“ (DELTA for short) project was launched in January 2016 to bring electric cars up to speed in terms of data security. Funded by the German Federal Ministry for Economics and Energy (BMWi), the project is scheduled to last for a period of three years.

Electric cars exchange data while driving as well as during charging. Data security and data protection must be guaranteed in order to ensure consumer protection and accurate billing. A valid data security and data protection concept for the integration of electric vehicles into the smart power grid (Smart Grid) is the basis for green-power charging as well as for the establishment and use of value-added services. This makes electromobility convenient and safe.

International standardization has already succeeded in creating a basis for the exchange of information between electric vehicles and the charging infrastructure in the standard ISO 15118 “Road vehicles -- Vehicle to grid communication interface“. However, other stakeholders are also involved in the process and value chain of charging and value-added services: third-party providers, energy providers, network operators, fleet managers and vehicle manufacturers offering services (e.g. map services). Communication has not yet been standardized in this area. The current standardization protects neither the vehicle and charger nor the associated back-end and billing systems.

Results for product manufacturers, standardization and science

The declared aim of the DELTA project is therefore to achieve comprehensive data protection and security in metering and billing processes for electromobility users. The project evaluates the data protection and security requirements in terms of their economy and durability, but also in terms of their comprehensibility, practicability and adequacy - e.g. through prototypical implementation. DELTA develops guidance for product manufacturers, infrastructure and service providers (emphasis on SMEs) and standardization bodies. The project continuously makes the results available for further scientific research; a further goal is the development of the ISO 15118 series of standards.

Renowned partners in the consortium

The project consortium consists of the DKE German Commission for Electrical, Electronic and Information Technologies of DIN and VDE, the Research Institute of Automotive Engineering and Vehicle Engines Stuttgart FKFS, the Fraunhofer Institute for Secure Information Technology SIT, innogy SE (consortium leader), the Physikalische Technische Bundesanstalt PTB, the Communication Networks Institute at Dortmund University of Technology, together with Webolution GmbH and V2G Clarity and itsecworld as further partners.

DELTA

VDE APPLICATION GUIDE: “DC CHARGING WITH HIGH CURRENT FOR ROAD VEHICLES“

Electric vehicles are increasingly becoming part of everyday life. This and the development of higher battery capacities are leading to an increasing demand for rapid charging stations which offer high-power charging. It goes without saying that such charging stations should be safe in all respects. This is the responsibility of the car-makers and the German manufacturers and operators of the charging infrastructure. However, experience shows that international standardization needs time in order to develop the necessary technical rules, and so the considerably faster procedure of a VDE application guide was chosen for Germany. The aim is to submit a New Work Item Proposal created on the basis of the VDE application guide for DC charging with high current for road vehicles to the IEC as part of the international standardization efforts.

The VDE “DC charging with high current for road vehicles“ application guide has been subjected to a public enquiry procedure and covers the technical aspects of charging electric vehicles with high-current using the combined charging system (CCS, international charging standard for electric vehicles) and the appropriate connectors. It describes the more exacting measures required for high-current charging in comparison to conventional charging stations in order to ensure the required level of safety, and the inspection requirements for such facilities.

TECHNICAL GUIDELINE: CHARGING INFRASTRUCTURE FOR ELECTROMOBILITY, 2ND EDITION RELEASED

Electromobility is gaining increasing amounts of attention. Following the support programme for electric vehicles, the Federal Government is now also planning a EUR 300 million infrastructure programme for the construction of charging facilities. An updated edition of the “Technical Guideline: Charging Infrastructure for Electromobility“ has been published to reflect the constant stream of further developments.

Comprehensive revision of the first edition published in 2013, which was overseen by the DKE, had become necessary due both to technical changes and the impact of directives. The aim is to reduce fears and prejudice surrounding the construction and operation of the charging infrastructure.

The guideline therefore highlights what is needed for competent planning, construction and operation of a charging infrastructure and provides information on how to avoid risks or costly investment errors. It contains an overview of key standards and regulations. There is a growing need for information on the topic of electromobility, particularly with regard to the current support programme of the Federal Government. Here, the guideline also provides valuable background information.

The main target groups of the publication are home and property owners, property managers and car park operators, architects and urban planners, public administration employees, network operators, energy suppliers, electrical system planners and electricians.

The charging infrastructure technical guideline was developed in close coordination with the Association of the German Electrotechnical and Information-Technological Trades (ZVEH), the German Electrical and Electronic Manufacturers' Association (ZVEI) and the German Association of Energy and Water Industries (BDEW) and is freely available on the websites of the publishing associations.

> *www.dke.de/leitfaden-ladeinfrastruktur*

DIGITAL TWIN

Industry 4.0 and digitalization of the manufacturing industry are merging real and virtual worlds and presenting new challenges to standardization. It is assumed that all actual physical products in the future will have a “digital twin“ which is born along with the idea of the product. This serves as a production template and is constantly updated during the product development process. The Digital Twin project is dedicated to the goal of digitally screening such digital twins (which remain inseparable from the product during their entire life cycle) to ensure that they are in conformity with the standards.One of the challenges in the future will be to translate standards into machine-interpretable, formalized forms in order to increase the quality of standardization and the application of the standards. An intelligent software system such as that specified in the DKE vision would be able to check technical aspects of the digital twin during the engineering stage. This allows possible problems in the physical end product to be detected at an early stage and avoided.

The digital description of industrial components, machinery, manufacturing plants and factories not only provides (and optimizes) the design verification and EC declaration of conformity, but also reduces the potential workload for the manufacturer after the first test of the physical product. Manual labour processes can be reduced, problems can be detected at an early stage and can be solved more easily and at less cost. Today, design work is already being checked during the engineering stage by modern tools that offer standards-based test functions. However, users cannot currently assume that these controls actually meet the requirements of the directives and standards in full. The aims of the project are to carry out the digital screening at a universal product and domain level and to focus on standard compliance. However, the limits for this are not reached with engineering tools; independent programs or Web-service applications are also conceivable.

General Meeting, TC of the Future

Accordingly, a uniform and standardized exchange format is required, such as the AutomationML data format. The data of the digital twin stored in such a format is checked by the application against the machine-interpretable and formalized form of the standard.

The example of switchgear combinations - i.e. switch cabinets - can be used to check the accessibility of components and controls, to carry out a syntactical check of equipment labels and to provide documentation of warming, as well as compliance with air and creepage distances. If the product has been digitally screened, only the missing checks need to be performed on the final product. A key prerequisite for this is that standards in the future do not allow any room for interpretation - and it must be possible to use them in automated form. The goal of the digital twin project is the further development and realization of this vision as the driving force for this pioneering change in the standardization process.

PRESENTATION OF STANDARDIZATION COUNCIL INDUSTRY 4.0

Industry 4.0 is basically about ensuring full accessibility between the real world of an industrial plant and its digital representation, and vice versa. Digitalization is opening up new opportunities for shaping value creation globally for industrial equipment providers and industrial operators. International standardization is therefore crucial for the successful implementation of the German Industry 4.0 activities. A new form of interaction between the industry standards and those of the digital economy is required in order to bring about digitalized industry. This complexity requires a concerted approach from the full consensus-based standards organizations ISO and IEC and also from the consortiums and forums of the Internet world. Consequently, the BITKOM association, the VDMA, ZVEI and the standards organizations DIN and DKE founded the Standardization Council Industry 4.0 (SCI 4.0) from the Industry 4.0 platform for the comprehensive development of international standardization.

Prof. Dieter Wegener (Spokesman of the Industry 4.0 Standardization Council)

Division of labour between the platform, the Council and the Labs Network

ZDKI Conference 2016 - Radio interconnection systems

The “Reliable wireless communication in industry (ZDKI)“ support programme covers research into wireless technologies for industrial applications - especially in the context of Industry 4.0. More than 50 industrial and research partners are involved in eight projects aimed at developing technological solutions by 2018. They are supported by the accompanying research project BZKI which consists of five partners and is coordinated by VDE|DKE. The ZDKI projects are funded by the Federal Ministry of Education and Research (BMBF). The projects address two central requirements for wireless communication in industry: reliability and low latency. They thus lay the foundations for future industrial applications.

“Digitalization needs wireless communication that allows real-time applications“ was the key message of the 2016 ZDKI Conference in Renningen.

Sven Hamann, Vice President of the Corporate Research division at Bosch, welcomed around 100 participants and explained impressively how Industry 4.0 is being implemented in his company. As a global supplier, Bosch offers a very wide range of industrial products, yet it is also a user of industrial equipment in its own 250+ factories. Stefan Müller, BMBF Parliamentary State Secretary, stressed at the opening of the Conference: “Germany is the world‘s supplier of factory equipment, but it would be risky and short-sighted to rest on our laurels.“ He called for greater interdisciplinary collaboration in Germany, such as that already being practised in the ZDKI projects. German industry must seize the opportunities and find its place in this competition-critical environment. The Federal Ministry of Education and Research (BMBF) and ZDKI have therefore set up a EUR 40 million research programme to promote value creation in the field of industrial communication.

From left to right:
Host Sven Hamann (Bosch) with Stefan Müller (Parliamentary State Secretary at the BMBF) and Ansgar Hinz (CEO of the VDE)

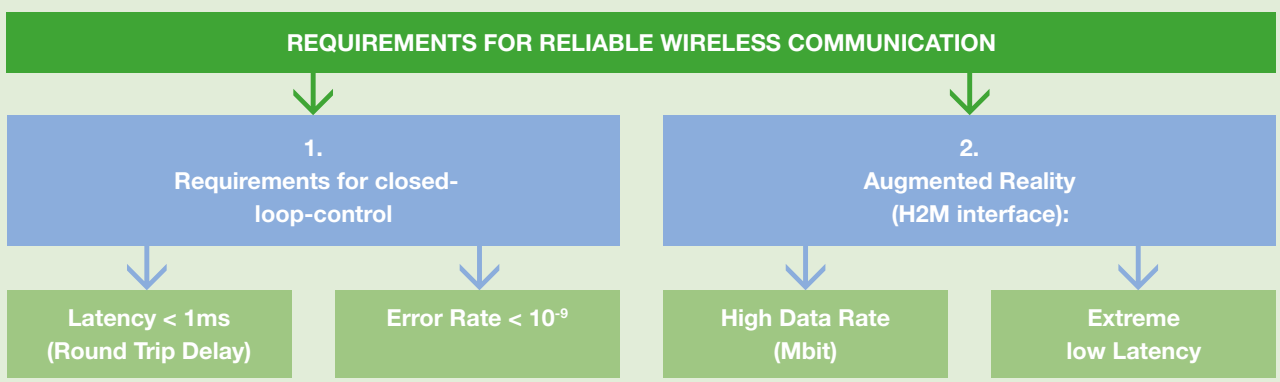
Industrial communication combines two different areas of expertise with different terminologies, perspectives, and experiences: telecommunications and industrial automation. It is therefore of prime importance “first of all to develop a common language“, according to Ansgar Hinz, CEO of the VDE. “Robots that roam through factories, systems that organize themselves, or components which move themselves to their processing machines, cannot be realized using cable technology,“ added Hinz.

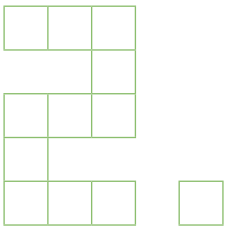
“Communication is a key element of Industry 4.0,“ said Bernd Kärcher, Director of Mechatronics Research at Festo. However, a significantly higher degree of interconnectivity is required compared with today in order to make the promises of Industry 4.0 reality, in particular in the form of new wireless communication solutions aimed at increasing flexibility and mobility. At the conference, the leaders of the individual projects presented their different approaches, which ranged from the modification of Wi-Fi technology through to the development of completely new wireless systems. “Radio technologies must perform at least as well as wired systems - such as CAN, PROFIBUS or PROFINET,“ said Kärcher.

The 5G communication standard covers a number of different technologies, and will play an important role in the future. These include cellular mobile communications technology as well as Wi-Fi. This allows the right type of wireless communication with the appropriate properties to be selected for each particular application.

Indeed, many companies are already working on Industry 4.0 projects in spite of the challenges of wireless communication in their production facilities. Examples here include the creation of a virtual toolmaking workshop at Daimler, as Dr. Sama Mbang, Industry 4.0 expert at the Daimler plant in Sindelfingen, reported. The supplier Bosch, too, has already entered the Industry 4.0 era. Work pieces are transported autonomously to the production lines there.

ZDKI USE CASES





A further common goal of the projects in the future is to use these technologies in a frequency spectrum allocated to

Industry 4.0. “It is important to give industry its own frequency band,“ said Professor Armin Dekorsy from the University of Bremen at the Conference. This also shows, he felt, that much more strategic and lobbying work needs to be done in addition to the research in the ZDKI projects. Technology by itself is not sufficient. Standardization, regulation and patent law aspects also play important roles in creating wireless communications for the factory of the future.

The programme is also of great importance for Germany as an industrial location. This was the unanimous opinion of all experts involved in the ZDKI research.

Further information about ZDKI and the current project details can be obtained from:

> *www.industrialradio.de*

INDUSTRY 4.0 COOPERATION WITH CHINA

Industry 4.0 standardization has brought the ongoing bilateral cooperation between Germany and China to a brand new level. Rolling out “Made in China 2025”, Chinese industries are going through a big wave of digitalization and upgrade. The concept of Industry 4.0 has resonated among many Chinese stakeholders, and the industries from both countries acknowledge the essential role of standardization as part of any research or technical cooperation. Common standards is a prerequisite for the interoperability required in the Industry 4.0 or intelligent manufacturing system.

In May 2016, the Sino-German Industry 4.0/Intelligent Manufacturing Standardization Sub-Working-Group led by the DKE and SAC (within the framework of Sino-German Standardization Cooperation Commission), had its second meeting in Leipzig and concurred on several cooperation lines, including Wireless Communication, RAMI I 4.0Reference Architecture Model/Intelligent Manufacturing System Architecture, IT Security and Functional Safety, Smart Manufacturing Robotics, I 4.0 Use Cases and Predictive Maintenance. Building on this momentum, the first Deutsch-Chinesisches Symposium zur Intelligenten Fertigung und Vernetzung der Produktionsprozesse has been successfully concluded in Berlin in November 2016. BMWi Staatssekretäre Mr. Machnig from Germany and MIIT (Ministry of Industry and information Technology) Vice Minister Mr. Huai from China participate in the Symposium and expressed their strong support to the industries for closer bilateral cooperation in Industry 4.0 related technologies.

2.

“MINI PV SYSTEMS“

Photovoltaic (PV) systems convert sunlight into electrical energy. To ensure that everyone can benefit from the technology, more and more manufacturers are offering “plug-and-play PV modules for balconies“. However, these frequently pose risks through the lack of contact protection, the bypassing of fuses and protection measures or cable overloading.

In order to make these so-called mini-PV systems user-friendly and, above all, safe to operate, a standard was developed by the newly founded DKE working group “Power connectors for feeding power into a separate circuit“ for the connection of power generation equipment for parallel operation with other power sources. The main focus was on avoiding potential hazards for the user.

As part of the work on the standard, a special plug was developed for feeding power into a separate circuit. The purpose of this is to ensure universal contact safety in the connections of mini-PV systems.

Mini-PV-System – Example

STANDARDIZATION-ROADMAP “LOW VOLTAGE DC“

The first edition of the German *“Low Voltage DC“* Standardization Roadmap was published in February 2016 and is available free of charge to all interested parties (in German and English) on the DKE website.

So many ideas and discussions were collected and conducted in the course of preparing this standardization roadmap that not all could be incorporated in the first edition. These include the topic of “Safe disconnection and switching“: safe disconnection and switching must also be ensured for direct current in order to prevent or eliminate hazards associated with electrical plant or electrically operated equipment and machinery. Further, equally important issues are protection against overcurrent, the labelling of plant and electrical equipment as well as the parallel operation of loads in the DC network. It is especially important to monitor the occurrence of resonance overshoots in extended DC power supply networks. Dangerous arcing may be automatically cancelled in AC by current zero - but this is not the case with DC. This problem has not yet been fully resolved and needs further investigation. A possible solution could lie in voltage and current level-based classification with respect to potential risk to people.

In order to address these and all other topics appropriately in the future and to consider the areas already discussed in the Standardization Roadmap in greater detail, work has begun on a second edition of the Standardization Roadmap, with publication planned for 2018 in Germany.

The growing interest in low voltage DC installations is also reflected internationally and a dedicated standards consortium (System Committee) is to be set up in 2017 in order to accelerate the standardization of such applications.

> *www.dke.de/roadmap-gleichstrom*

STANDARDIZATION PROMOTING ELECTRICAL ENERGY EFFICIENCY

New Standardization Roadmap provides impetus for innovation and investment in “electrical energy efficiency“

Germany might be leading the way in climate change agreements and is considered to be an international market and innovation leader in energy-efficiency technology, yet it is lagging behind its own energy goals. The new VDE|DKE “Electrical Energy Efficiency“ Standardization Roadmap, which was developed and discussed for the first time together with a large number of contributors in the form of a blog on various social media channels, shows how Germany can get itself back on course.

The successful interaction between standardization and innovation makes a significant contribution to electrical energy efficiency. For example: in household appliances alone, energy consumption has been reduced by more than 30 per cent in recent years. This is equivalent to the annual output of a large nuclear power plant. The EU Energy Label and Eco-Design Directive has played a major part in this success. There is, however, even larger untapped potential in the field of energy efficiency.

For example, the amount of energy required by electric motors in German industry could be reduced by about 30 TWh by 2020 - enough to render several large power plants superfluous. Efficient lighting and heating systems are yielding similar savings. “The future is smart,“ says VDE standards expert Frank Steinmüller. “More and more intelligent applications are making life easier for us. Yet these, too, need energy and we want to keep this as low as possible“.

To fully exploit all potential electrical energy efficiency savings, available innovative products and technologies must be used consistently, and new standards and measurement techniques adopted and applied. Industry and the government are called upon to create greater transparency and more incentives. And consumers themselves must help by making increased use of energy-efficient products. Standards and test labels can help here. Standardization experts regard the strong commitment of German experts to the key committees of the international standardization bodies as a good sign that German engineering knowledge will continue to make an important contribution to future topics such as electric energy efficiency.

The Standardization Roadmap was published in German and English versions and presented to coincide with the 80th IEC General Meeting in Frankfurt in 2016.

> *www.dke.de/roadmap-energieeffizienz*

FUNCTIONAL SAFETY VS. INFORMATION SECURITY

On the threshold of the fourth industrial revolution it has become apparent that the vulnerability of IT systems in industrial control systems to malicious attacks is being underestimated in many cases. Today, industrial control systems need to be operated for long times, preferably without significant changes. However, the principle of “never touch a running system“ is in conflict with the necessity of installing security patches.

Several current trends are reinforcing the need to pay more attention to the subject of “information security“:

- The applications are now more closely interconnected
- The number of attacks detected on IT systems is increasing rapidly
- The network of partners involved in the entire business process is becoming more complex (e.g. supply chains)

- This means that security features which ensure the functional safety of a system are also becoming more vulnerable. This can cause such functions to be altered or no longer provided, resulting in potential harm to people and the environment.

So far, there are only a few general descriptions of the industrial system requirements for functional information security. In addition, there is a risk that insufficient monitoring of the interaction between the two subject areas could result in inadequate or excessive requirements being specified: inadequate requirements compromise functional safety, excessive requirements reduce profitability.

Two series of standards are crucial for this area:

- IEC 61508 “Functional safety of electrical/electronic/programmable electronic safety-related systems“
- IEC 62443 “Communication industrial networks - IT security for networks and systems“

IEC 61508 stipulates monitoring of malicious and unauthorized actions and refers to IEC 62443, however this does not cover functional safety sufficiently. The TBINK working group “IT Security“ is therefore now addressing the topic of “IT security and functional safety“. In particular, it covers conflicts between information security and functional safety: while the functional safety systems, for example, are changed as rarely as possible (because new certification generally has to be obtained upon each change), information security systems need to be regularly updated (thereby reducing known vulnerabilities).

The resulting VDE application guides of the working group map the links between information safety according to IEC 62443 for industrial control systems and those for functional safety according to IEC 61508, and describe the connection between functional safety and information security requirements, thereby permitting an efficient combination of measures.

VDE Special Conference on Functional Safety - Opportunity for manufacturers, developers and operators to meet the “creators“ of the functional safety and IT security standards

Standardization experts will be highlighting the challenges regarding the safety of products, their components and systems against the background of Industry 4.0 on 22 and 23 March 2017 at the *“Functional Safety and IT Security 2017“* Conference in Erfurt. “What is the current status of standardization?“, “Where is there need for action?“ and “Where is there room for improvement?“. These are the topics that will be discussed by experts in connection with the basic functional safety standard (IEC 61508), the functional safety for the process industry standard (IEC 61511) and the IT security standard (IEC 62443).

In addition, experts who deal internationally with the standardization of secure software will be providing information on the further development of Part 3 of the basic safety standard (IEC 61508-3) which covers software engineering.

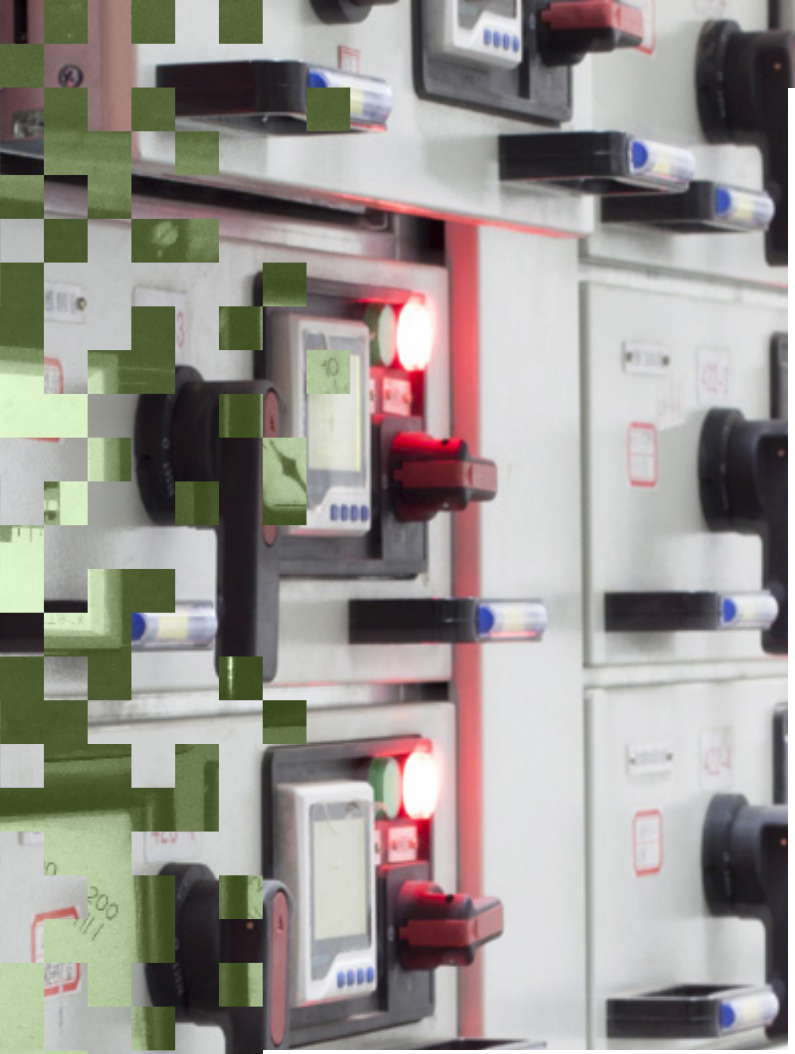
The Conference will give all participants the opportunity to speak with, and obtain information directly from, the authors of these standards and from those directly involved in the standardization process. In the discussions, participants will have the opportunity to question the current standardization trends in these areas.

2.

METER PANELS – IN SHAPE FOR THE ENERGY MANAGEMENT OF THE FUTURE

Meter panels occupy central positions in residential and commercial buildings today, but they have also conquered many new application areas such as photovoltaic systems, charging stations for electric cars, block heat and power plants or power port columns for other outdoor applications. These days the energy flows are bi-directional - i.e. an energy consumer may now also be an energy producer. Also, the meter panel is the interface between the smart home and the smart grid and thus represents an important communications centre.

The introduction of electronic household meters with their many new application areas has led in recent years to an ever increasing range of meter panels and thus to extensions of the corresponding “small distribution boards and meter panels“ series of standards. This is now being revised and fundamentally restructured in DKE/UK 543.1 “Meter panels and small distribution boards“. Experts from manufacturers, energy suppliers, testing bodies as well as the FNN are actively involved here. The aim is to align the standards more closely with existing and future applications and to address all types of meter panels in Germany. Future meter boxes will hold the electricity meters but also a smart-meter gateway, a control box and additional protective equipment and have continuous current-carrying capacity. At the same time, the content of the “Meter Panels“ series of standards is being integrated.

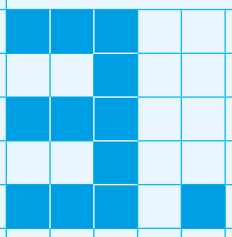


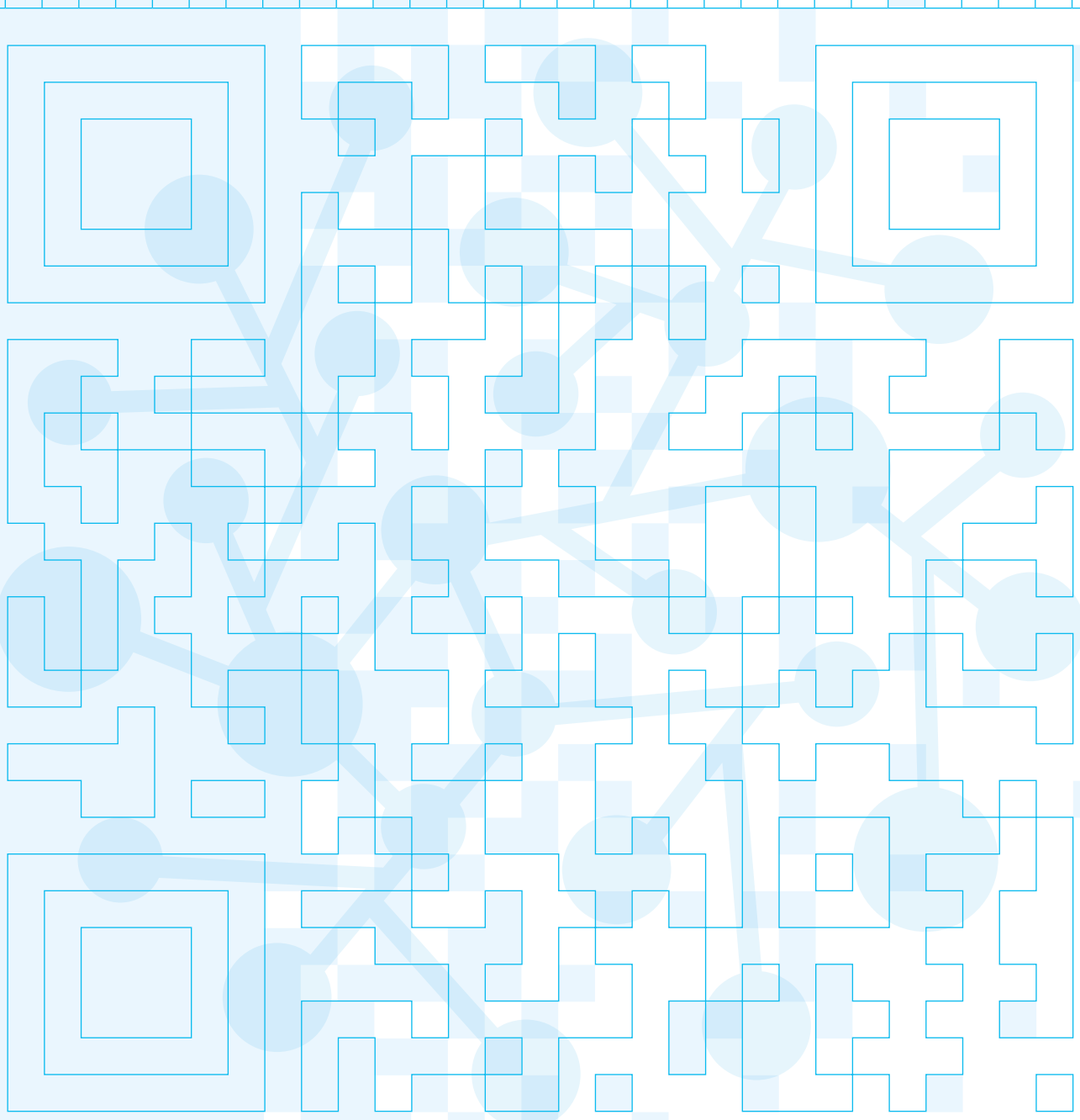
The requirements and tests for small distribution boards are also being removed from the series of standards, as these are covered in the “Boxes and enclosures for accessories for household and similar fixed electrical installations“ standard. Parts 1 and 2-1 have just been published, and parts 2-2 and 3-2 will follow shortly.

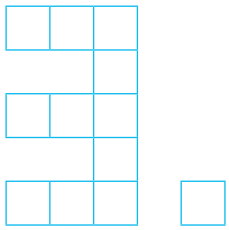
The standards provide for future-proof meter panels that can accommodate future extensions to the intelligent measuring system. This means that meter panels in Germany are already equipped today to meet the energy management needs of tomorrow.

DIN VDE 0603 (VDE 0603) – NEW STRUCTURE

General and systemic requirements	Products for meter panels	Application
• **VDE 0603-1** General requirements • **VDE 0603-2-1** Meter panels for direct measurement up to 63 A • **VDE 0603-2-2** Meter panels for half-direct measurement up to 1000 A	• **VDE 0603-3-1** Main line terminal • **VDE 0603-3-2** BKE for electronic household meters • **VDE 0603-3-3** Terminal connectors for meters	• **VDE 0603-100** Meter panel for integration of measurement sytems







FAR, FAST, FURTHER, FASTER: CONNECTING COMMUNITIES

EVENTS
PERSONNEL/AWARDS
SERVICE

STANDARDIZATION NETWORKING THE FUTURE

This was the theme of the DKE Conference which was held in May 2016 at the Büsing Palais in Offenbach. In their talks the speakers presented their visions for the future and news from their committee work, in which modern forms of networking are breaking down old structures.

This applies to highly complex, technology-convergent fields of application in which all stakeholders and technologies must work together on an interdisciplinary and networked basis. This is confronting standardization with new challenges: it has to reinvent itself in order to meet the market's expectations and to remain appealing for the experts involved.
The committee work is increasingly networked and uses modern IT tools: more and more standardization-related information is being disseminated via communication channels such as social networks, and standards are being developed online. The DKE President, Roland Bent, urged all concerned to incorporate new aspects and to expand the standardization network.

Markets are more agile than governments. Industry needs safeguards that extend beyond national borders. Standardization provides added value beyond borders.

Meeting movie

> *www.dke.de/dke_tagung_2016*

The presentations of the speakers in detail:

- **Standards in the era of Industry 4.0**
  Prof. Sabina Jeschke, RWTH
- **Does the internal market need standardization?**
  Kerstin Jorna, DG Markt, European Commission
- **Standardization of the future with new methods and products**
  Prof. Ulrich Epple, RWTH Aachen
- **Design and implementation of a two-way powerline communication system for intelligent lighting systems**
  Colin de Vrieze
- **Stories about the future - User stories**
  Jessica Fritz, DKE
- **What do the standards commenting procedure and a goldfish bowl have in common?**
  Dominik Nied, DKE
- **Workshop on collaborative standardization**
  Karsten Hunger, DKE
- **Legislation and standardization - A high-tension relationship**
  Dr.-Ing. Jörg Hartge, ZVEI
- **Minimizing risk with the hazard based standard (IEC 62368)**
  Holger Eilhardt, KEYMILE GmbH
- **Safety in DC applications**
  Georg Luber, Siemens AG

THE 80TH IEC GENERAL MEETING 2016

Major success for the international electrotechnical standardization community

Attracting more than 3,500 participants from over 80 countries, this year's IEC General Meeting in October 2016 in Frankfurt am Main was the largest in the history of the International Electrotechnical Commission. Experts from the management bodies and technical committees - and also young professionals - took part in nearly 450 meetings and events. The large number of participants shows the great interest of the community not only in the specific topics of the General Meeting, but also in the various issues surrounding the restructuring of the IEC.

This year's theme was "Connecting Communities - Reinvent Standardization", focussing on innovation and communication. Against this background, the future course of standardization work was set, reflecting the developments in global digitalization. Encounters between different people, groups and organizations were encouraged by the innovative Broadcasting Center, the growing web presence and the intensively used event app. And, not least, the various social events - from the great Opening Event through to the Farewell Party - were all aimed at getting the participants to engage with each other.

The future of standardization - as envisioned in the Reinvention Laboratory

The real significance of the 80th IEC General Meeting did not, however, lie in any quantitative records which were set, rather in the special quality of the content. This was apparent at the working-level in the numerous meetings, but also at the innovative discourse level as embodied above all by the Reinvention Laboratory.

The Reinvention Laboratory was the brand-new platform for presentations and information dedicated to the burning questions of the future of electrotechnical standardization. Here, key topics such as digitalization, new processes, new formats and Industry 4.0 with Standardization Council 4.0 and online collaboration were explored and discussed openly in a dialogue between presenters and experts.

The Reinvention Laboratory was the brand-new platform for presentations and information dedicated to the burning questions of the future of electrotechnical standardization. Here, key topics such as digitalization, new processes, new formats and Industry 4.0 with Standardization Council 4.0 and online collaboration were explored and discussed openly in a dialogue between presenters and experts.

The Reinvention Laboratory discussion sessions yielded the following **core requirements for the standardization work of the future:**

- Expanding and intensifying IEC cooperation with forums and consortiums
- More flexible, more efficient and faster standardization processes and workflows
- Making standards and requirements machine-readable, to facilitate the use of standards e.g. in Industry 4.0
- Standardizing tests and making them machine-readable, to facilitate their use in conformity assessments
- Making standard content generally more attractive and accessible.

The effective and attractive digital tools required for this must be available worldwide. This result is a toolbox for the standardization work of the future which, besides enabling regulated and transparent cooperation, also needs to ensure data security.

Frankfurt Agreement strengthens cooperation between IEC and CENELEC

The President of the IEC, Dr. Junji Nomura, and the CENELEC, Dr. Bernhard Thies, signed the "Frankfurt Agreement" during the IEC General Meeting in Frankfurt. The Agreement governs the close cooperation between the International Organization for Standardization (IEC) and its European counterpart, CENELEC. The "Frankfurt Agreement" builds upon the "Dresden Agreement" from 1996. The main objective of the Agreement is to underline the international orientation of electrotechnical standards and to bring them in line with the boundary conditions which have applied since 2006.

New committees for wearables and low voltage DC power supply

The IEC/SMB (Standardization Management Board) resolved the creation of two new technical committees. Firstly, a committee was established for wearables. These are worn separately on the body or incorporated into clothing, and are gaining in importance in particular through their diverse applications in the wellness, health and medical fields.

Secondly, the IEC set up a new system committee for low-voltage DC power in response to the resurgence of interest in DC current for the use of renewable energies and for reasons of energy efficiency in household appliances.

> *www.iec2016.org*

This IEC General Meeting set a clear course for the future of electrotechnical standardization.

Key conclusions drawn at the IEC General Meeting 2016 were, once again, the need for digitalization and the requirement for corresponding changes in the standards. This will not, however, be implemented in the immediate future.
The 80th IEC General Meeting in Frankfurt am Main ended with the official passing of the baton to the Russian delegation, which will organize the 81st IEC General Meeting in Vladivostok in October 2017.

Thank you to the sponsors and all who made this meeting a success through their commitment and dedication!

PRESENTATION OF THE 2016 DKE AWARDS

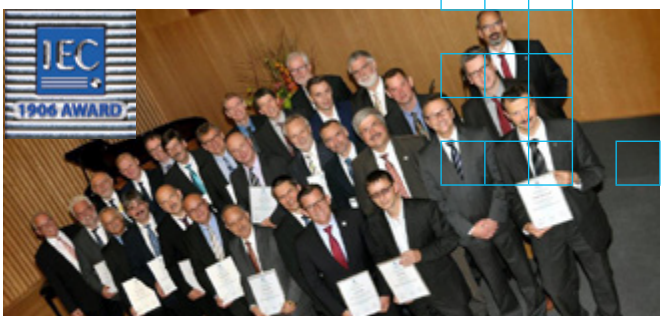
For the twelfth time in succession, outstanding electrical engineering experts were honoured at the annual conference of the DKE in Offenbach am Main.
The President of the DKE, Roland Bent, underlined the exceptional contribution of the two gentlemen to standardization and the resulting benefits for society in general.
The technical experts who received DKE Awards were:

Die Technischen Experten, die mit der DKE-Nadel auszeichnet wurden, sind:

- **Winfried Tröster**, Mennekes Elektrotechnik GmbH & Co. KG, Kirchhundem;
- **Claus-Dieter Ziebell**, Siemens AG, Regensburg

> *www.dke.de/dke-nadel-2016*

From left to right:
Dieter Ziebell, Winfried Tröster



IEC 1906 AWARDS

Since 2004 the IEC has presented the IEC 1906 Award every year to technical experts from all over the world in recognition of their outstanding achievements in the field of international standardization. The name of the award marks the year in which the organization was founded.

Ludwig Birkl, Siemens AG; ***Werner Böser***, ABB STOTZ-KONTAKT GmbH; ***Dr. rer. nat. Peter Brogl***, Mersen Deutschland Eggolsheim GmbH; ***Martin Brose***, BG Energie Textil Elektro Medienerzeugnisse; ***Ludwig Büermann***, PTB Physikalisch-Technische Bundesanstalt; ***Dr. Thomas Fischer***, Siemens Healthcare GmbH; ***Charalambos Freed, Dr. Elmar Fuchs***, VDMA, German Engineering Federation; ***Günter Gabriel***, Pepperl+Fuchs GmbH; ***Dr. Joachim Gerster***, Vacuumschmelze GmbH & Co. KG; ***Harald Glabsch***, Institute for Occupational Safety and Health of the German Social Accident Insurance; ***Dr. Wolfgang Habel***, BAM Federal Institute for Materials Research and Testing, Dept. VIII.1; ***Armin Heindel***, Siemens AG; ***Michael Hingott***, TÜV SÜD Product Service GmbH; ***Prof. Dr. Erik Jacobson***, Universität Tübingen; ***Peter Kaluza***, Siemens AG – Digital Factory Division; ***Klaus-Wolfgang Klingner***, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE; ***Ursula Kniesberg***, Philips Medical Systems DMC GmbH; ***Christian Krömer***, Siemens AG; ***Dr. Mihails Kusnezoff***, Fraunhofer Institut für Keramische Technologien und Systeme (IKTS); ***Sanjay Mukoo***, ***Rainer Pfeifle***, WOLFGANG WARMBIER GmbH & Co. KG; ***Dr. Ulrich von Pidoll***, PTB Physikalisch-Technische Bundesanstalt; ***Dr. Lutz Rauchhaupt***, ifak – Institut für Automation und Kommunikation e.V. Magdeburg; ***Clemens C. W. Ruppel***, EPCOS AG; Siemens AG – Energy Sector; ***Dr. Uwe Schmidt***, Hochschule Zittau/Görlitz; Fakultät Elektrotechnik und Informatik; ***Heribert Schorn***, Institute for International Product – Safety GmbH – I2PS; ***Adrian Sharman***; ***Stefan Siebert***, Dr. Brockhaus Messtechnik GmbH & Co. KG; ***Peter Huber***, Kältemaschinenbau AG; ***Dr. Lars Sitzki***, TÜV NORD International GmbH & Co. KG; ***Dr. Waldemar Stoecklein***, Corning Optical Communications GmbH & Co. KG; ***Axel Thiel***, OC GmbH; ***Benno Weis***, Siemens AG – Digital Factory Division; ***Mike Wöbbeking***, DNV GL – Energy; ***Joachim Wosgien***, PHOENIX CONTACT GmbH & Co. KG; ***Dr. Joachim Zietlow***, Sony Europe Ltd.ted-Reality-Präsentation

From left to right: Jim Matthews, IEC Vicepresident, Dr. Bernd Sisolefsky

From left to right:
Dr. Ulrich Spindler, IEC Vicepresident, Heribert Schorn

CONGRATULATIONS! WINNERS OF THE IEC THOMAS A. EDISON AWARDS 2016

"I never perfected an invention that I did not think about in terms of the service it might give others ..."

Thomas Edison

By naming its award after Thomas Alva Edison, the IEC honours the memory of a pioneering genius. The above quotation shows that the ideas of the 19th century inventor and entrepreneur are still valid today. It is now more important than ever to evolve the sectorization of electrical engineering, to create systems that offer their users an effective service, and also to bring forth simplifications comparable with those once made possible by the introduction of the generation of usable electricity.

Two of this year's eight winners come from the ranks of the German IEC delegation.

The IEC Conformity Assessment Board presented an award to Heribert Schorn, honouring an experienced and recognized quality assurance expert in the field of product safety. Mr Schorn works in the relevant standardization bodies at the national, European and international levels.

The IEC Conformity Assessment Board presented an award to **Heribert Schorn**, honouring an experienced and recognized quality assurance expert in the field of product safety. Mr Schorn works in the relevant standardization bodies at the national, European and international levels.

Dr. Bernd Sisolefsky works for and represents the German Federal Network Agency in the electromagnetic CENELEC and IEC standardization bodies. He was presented with the DKE Compatibility Award by the Chair of the Standardization Management Board, James E. Matthews III.

UWE KAMPET RECEIVES THE HIGHEST HONOUR OF THE IEC

110 years ago last June, the newly-founded International Electrotechnical Commission elected the mathematician, physicist and engineer William Thomson - known by his title “Lord Kelvin“ - as its first president. In his memory, the IEC presents the Lord Kelvin Award, its highest honour, to outstanding individuals in the field of electrotechnical standardization. The importance of this award is apparent from the fact that it is not presented at regular intervals, but only if the recipient meets the strict criteria. We are therefore all the more pleased that this award was presented at this year‘s IEC General Meeting in Frankfurt to Uwe Kampet.

An expert in electromagnetic compatibility (EMC), Uwe Kampet began working in 1990 in the field of home appliances within the DKE. Shortly afterwards he also began to contribute to European and international standardization. He is also a member of the International Special Committee on Radio Interference (CISPR). He has assumed leadership responsibilities as committee chairman in all these organizations.

He is one of the few experts who are not only active in standardization, but are also influential in the field of conformity assessment. He is currently a member of the “Conformity Assessment Board“ of the IEC.

In 2014 he was made Vice-President Technology of the European standardization organization CENELEC where he is now introducing important reforms.

In the DKE he serves on the Advisory Board for International and National Coordination which he recently became head of. He has headed the Advisory Board for Conformity Assessment since 2014.

From left to right: Dr. Junji Nomura, Uwe Kampet, Frans Vreeswijk

From left to right: Dr. Bernhard Thies, Uwe Kampet

DR. RALPH SPORER IS THE NEW CHAIRMAN OF THE SMB

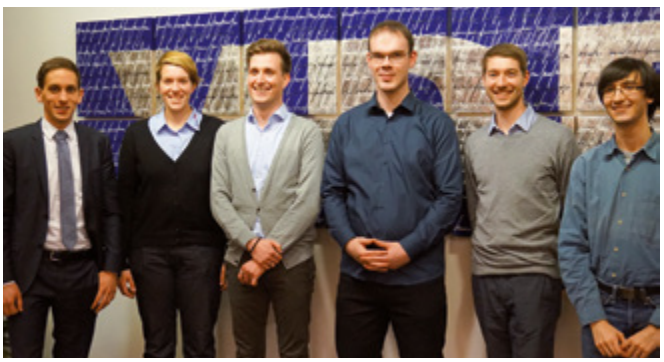
The IEC General Meeting has elected Dr. Ralph Sporer the new Chairman of its Standardization Management Board (SMB), which supervises and controls the technical work of the IEC. He has been SMB Chairman for three years now as well as IEC Vice-President.

“It is a great honour and I am very pleased to assume responsibility as Chairman,“ said Dr. Sporer upon the announcement of his election. The DKE and the entire German National Committee of the IEC congratulated Dr. Sporer and assured him of their full support.

Dr. Sporer, Director of Standardization and Regulation at Siemens, is responsible for the internal and external standardization activities in the field of innovative technologies and digitalization in all areas of electrotechnical applications. After becoming a member of the former IEC “Energy Efficiency“ Strategic Group in 2008, Dr. Sporer was made Chairman of the IEC Advisory Board for Energy Efficiency in 2013. He was also a member of the SMB working group that defined the IEC system activities. Since 2010 Dr. Sporer has been Chairman of the European Smart Grid Coordination Group. Enjoying close links with the former IEC “Smart Grid“ Strategic Group and the new “Smart Energy“ System Committee, this group has developed a systematic methodology for the interoperability of complex systems with various stakeholders. For example, it put forward the “Smart Grid Architecture Model (SGAM)“ which forms the basis of the “IEC Smart Grid mapping tool“. As a core element of the standardization efforts in the field of complex systems, this model is now being worked on in other areas of the IEC system.

Nationally, Dr. Sporer is a member of the German National Committee and its advisory boards, as well as head and expert member of the Technical Committee of the aforementioned technical areas.

From left to right:
Michael Teigeler, Roland Bent,
Dr. Ralph Sporer



Anja Kurth

DKE SCIENCE TO STANDARDS (STS) SUPPORT PROGRAMME FOR YOUNG ENGINEERS

The DKE Science to Standards programme is aimed at engineering students who tackle standardization-related issues in their Bachelor‘s or Master‘s thesis.

In 2016, a total of nine students successfully completed their theses. The spectrum was once again very broad. Many facets of electrical engineering - ranging from use cases for smart-glasses and robot control via a laser pointerthrough to investigations into low-voltage legacy switch-gear and economic feasibility studies into energy storage systems - were represented. We would like to express our special thanks to **bei Benjamin Braun, Robin Fischer, Anja Kurth, Andreas Lukaschik, Florian Schäfer und Richard Wolf**, who entered the 2016 competition for the best thesis on 14.12.2016 in Frankfurt and presented their work to each other and the jury. All the papers were well presented and were enthusiastically received in the relevant DKE bodies.

We would like to wish them all every success in their careers and all the best for the future!

And the winner is…

Our congratulations go to the winner of this year‘s competition, Anja Kurth, who impressed the jury with her Master‘s thesis entitled “VLF testing of high voltage cable systems“. In her thesis she impressively explained how important standardization is for safe and stable energy supplies.

Anja Kurth: “Without the STS programme the ‚VLF testing of high voltage cable systems‘ project would not have been possible in this form. The STS programme gave me access to the standards which were an essential part of this project.“

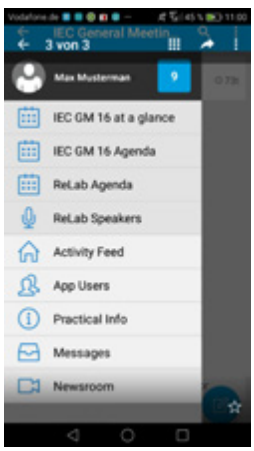
Ms Kurth will be given the opportunity to present her work at the 2017 DKE Conference.

MULTIMEDIA COMMUNICATION - CONNECTING PEOPLE AND CONTENT

In recent years, the DKE app has allowed all interested parties to view the current editions of roadmaps, annual reports and other publications on their mobile devices at any time. The latest development of this successful venture is an event app which was put through its paces for the first time in spring 2016 during the DKE conference and then again in the autumn at the IEC General Meeting in Frankfurt under the banner of “Connecting communities“.

The IEC General Meeting app. Available in compact form on smartphone or tablets, it not only contains all the information users might need but also offers them the opportunity to interact with other app users or to post contributions. These features were used extensively by participants at the events. Each of the more than 1,300 registered users could put together their own schedule and were then automatically sent notifications in the event of room changes, for instance. In-app polls and surveys collected the views of participants on current standardization trends and showed the results. The community users were able to communicate actively with each other via social media posts.

The media portal of the event website quickly became a virtual second home at the General Meeting. Numerous reporters put together articles for the website and app in the specially created Broadcasting Center during the main week of the event. The video footage was also coordinated by the Broadcasting Center. A video summary of the daily highlights was created on each day of the event, for example. A total of roughly 50 videos now exist which document the main events of the General Meeting.



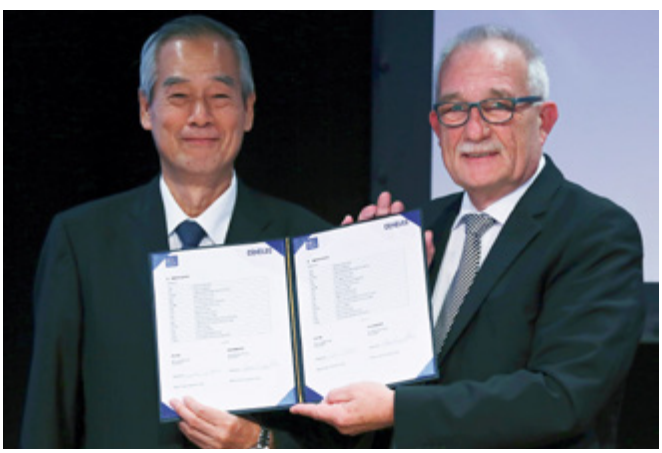
IEC App

FRANKFURT AGREEMENT STRENGTHENS COOPERATION BETWEEN IEC AND CENELEC

Work on the Frankfurt Agreement was begun by the DKE in the middle of 2015. It was concluded upon being signed by the presidents of the IEC, Dr. Junji Nomura, and the CENELEC, Dr. Bernhard Thies, during the 2016 IEC General Meeting in Frankfurt.

The Agreement governs the close cooperation between the International Organization for Standardization (IEC) and its European counterpart, CENELEC. The Frankfurt Agreement builds upon the Dresden Agreement from 1996 and develops its content. The Dresden Agreement introduced the parallel coordination procedure. This translates internationally elaborated standards into European standards. Now, over 80% of all European electrotechnical standards are of international origin and comply with the IEC standards. “The Frankfurt Agreement reaffirms the primacy of international standardization. The Agreement is a further important step towards harmonizing European standards with their international equivalents. It boosts the competitiveness of European industry in the global market,“ said Dr. Bernhard Thies. The Agreement also helps to avoid duplication of work, to reduce the amount of time spent on the development of standards, and to make effective use of the knowledge of European and IEC experts.

The main innovation in the Frankfurt Agreement is the introduction of the abbreviation “IEC“ in the names of all European standards which are identical to IEC standards. The changes in the European legal framework (European Regulation no. 1025/2014) and the digitized work platforms have also been adopted.



From left to right: Dr. Junji Nomura, Dr. Bernhard Thies

SERBIA IS A NEW FULL MEMBER OF CENELEC

With effect from 1 January 2017 the National Electrotechnical Committee of Serbia - Institute for Standardization of Serbia (ISS) - was accepted as the 34th full member of CENELEC.

The ISS has been working intensively together with CEN and CENELEC since 2013 to ensure that it meets all conditions for its accession. The ISS application for full membership of CEN and CENELEC was officially accepted at the last General Meeting of the two organizations in Brussels. This represents a further important step for Serbia in its quest to obtain EU membership.

The ISS will then be the 34rd European organization to join CENELEC: these include the institutions of all 27 Member States of the European Union, three countries of the European Free Trade Association (Iceland, Norway, and Switzerland), as well as four EU candidate countries (Croatia, Turkey, the Republic of Macedonia and Serbia).

DKE is the German CENELEC member. Roughly 550 DKE technical experts represent German interests in the CENELEC‘s technical committees.

ISS ИСС

Logo of the National Electrotechnical Committee of Serbia

“SHAPING THE FUTURE WITH STANDARDS!“- THE NEW GERMAN STANDARDIZATION STRATEGY

In close coordination with the Federal Ministry for Economic Affairs and Energy (BMWi), the standardization stakeholders have defined the German standardization strategy since 2004 based on the following mission statement: “Standardization in Germany serves the economy and society in strengthening, shaping and opening up regional and global markets“. This mission statement has characterized German standardization and provided it with clear orientation for a decade. Many measures have been implemented since then. Nevertheless, new economic and social challenges have come to the fore in recent years. Dr. Albert Dürr, DIN President, therefore used his speech to the General Meeting at the end of 2015 to urge the development of a “German Standardization Strategy 2020“. At the invitation of the DKE President Roland Bent, the initiative was launched in a workshop run by the DKE in cooperation with DIN on 30 March 2016 in Frankfurt am Main. This “World Café“ workshop was attended by sixteen leading individuals from various sectors of industry, government bodies and science. This laid the foundation for the new standardization strategy which was developed into a first draft in a further workshop. Subsequent to this, the draft was released for comments. Over 300 constructive comments were filed in the public and Internet-based consultation process. The public consultations and participation of all interested parties, stakeholders and government officials in Germany came to a conclusion at the final Conference on 27 September 2016 when more than 90 participants discussed the contentious aspects of the submitted comments on, and contributions to, the draft standardization strategy. Through this extensive support and participation we have succeeded in developing a strategy which meets the needs of Germany and all parties interested in standardization.

The consolidated result was finally adopted by the DIN pre-

sidium on 3 November 2016 with the following vision: “Shape the future with standardization!“

The main objectives of the standardization strategy are:

- International and European trade is facilitated by standardization.
- Standardization relieves the strain on (and supports) national regulations
- Germany promotes worldwide standards for future issues by bringing together stakeholders and developing new processes and open platforms for coordination
- Economic and social factors are the driving forces behind standardization.
- Standardization is used in particular by companies as a strategic and attractive instrument.
- Standardization enjoys high status in the public perception.

COOPERATION WITH PTB IN IEC GM 2016

Availing the unique opportunity of IEC GM in Frankfurt, the DKE and the PTB co-organized an unprecedented IEC “Workshop of Industrializing Countries” in Braunschweig. Improving access to energy for people in rural or remote areas is a key concern for many developing economies.

However, a reliable energy supply chain would require standards to ensure the safety and performance of the network on one hand, and technical infrastructure such as measurements, conformity assessment and accreditation – quality infrastructure on the other. Focusing on renewable energy in support of rural electrification, the workshop introduced relevant standards in the IEC and the benefits of using common international standards. Equally important, successful cases and experience from Germany, India and other developing were exchanged during the workshop to encourage further engagement of IEC Affiliate Countries, as well as to accentuate the crucial partnership between metrology and standardization organizations. The DKE and the PTB have also agreed to continue this collaboration in future quality infrastructure (QI) projects in developing countries.

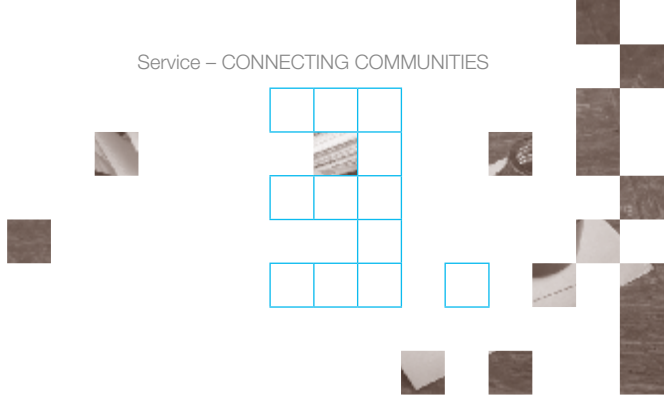
STANDARDIZATION INITIATIVE SUPPORTS EUROPEAN INTERNAL MARKET

CENELEC President Dr. Bernhard Thies, EU Commissioner Elżbieta Bieńkowska, Dutch Minister Henk Kamp and representatives of other participating organizations, as well as Kevin Behnisch, team leader of International Cooperation for the DKE, signed the Joint Initiative on Standardization (JIS) on the 13th June 2016 at the Single Market Forum in Amsterdam. The Single Market Forum is a joint initiative of the European Commission set up under the Dutch Council Presidency in 2016. It is devoted to issues such as cross-border trade in services, public procurement, capital markets, e-commerce and standardization.

In the JIS, the EU is tackling the modernization of EU standardization policy in the context of the EU internal market strategy. The JIS is an initiative in which the European and national standardization organizations and bodies, industry, SMEs, consumer associations, trade unions, environmental organizations, Member States and the European Commission have agreed on a 15-point plan. The DKE was one of the principal bodies involved in elaborating the action plan to strengthen the EU Commission‘s single market strategy, e.g. to promote digitalization in the standardization context and to incorporate research and innovation trends earlier in the standardization process. Research and industry are strongly involved in the development of harmonized standards, and the European Commission is striving to achieve timely and market-driven implementation of standardization work in order to ensure the international competitiveness of European industry.

Elżbieta Bieńkowska, Commissioner for the Internal Market, Industry, Entrepreneurship and SMEs, stated: “The Common Standardization Initiative brings public and private organizations to the table to engage in a cooperative, transparent and flexible dialogue as a means of ensuring that state-of-the-art standards are developed in good time that meet the rapidly changing needs of the market and government policy.“

Group picture of the official signing of the Joint Initiative on Standardization (JIS)



FIGURES

	Figures up to 31/12/2016	publishes in 2016
IEC-Standards 2016		
IEC standards	6.327	458
IEC/TS	288	56
IEC/TR	481	52
IEC-PAS	42	8
Final drafts (FDIS)	45*	321
Drafts (CDV)	173*	493
Main projects (ANW + Maintenance)	–	398*
Cenelec-Standards 2016		
EN	6.630	418
HD	227	11
CLC/TS	80	8
CLC/TR	107	6
Ongoing projects	1,234	–
prEN + prHD	–	810
ETSI-Standards 2016		
EN	1,376	148
ES	329	13
TS	2,062	2,312
EN drafts	–	209

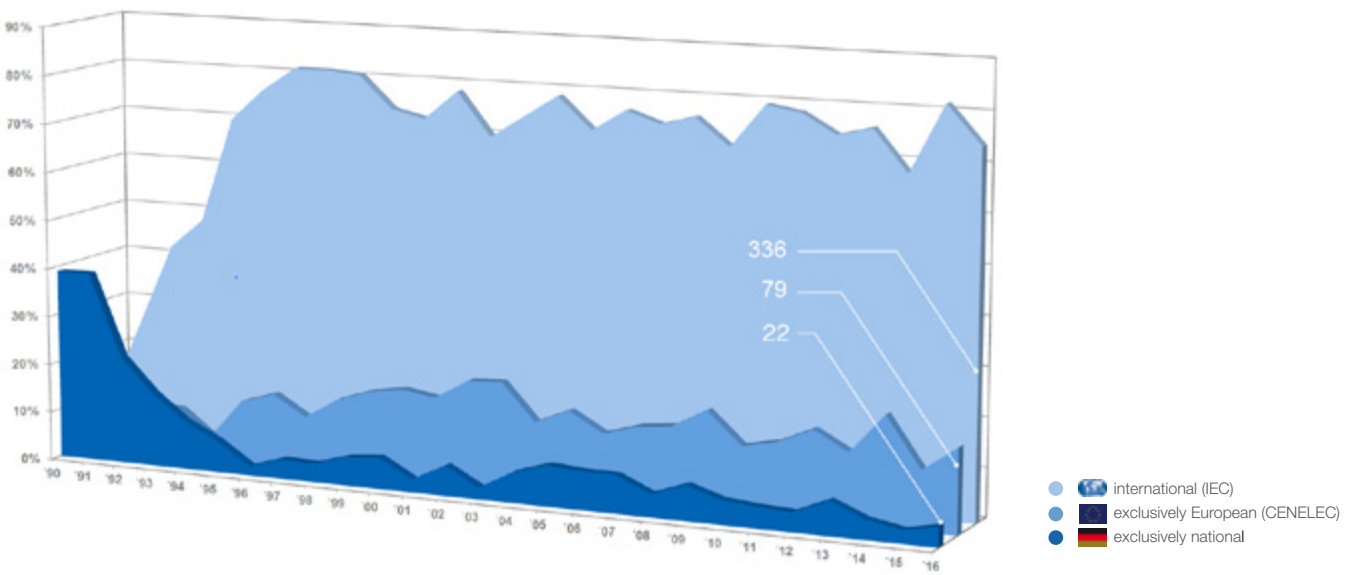
* Provisional value

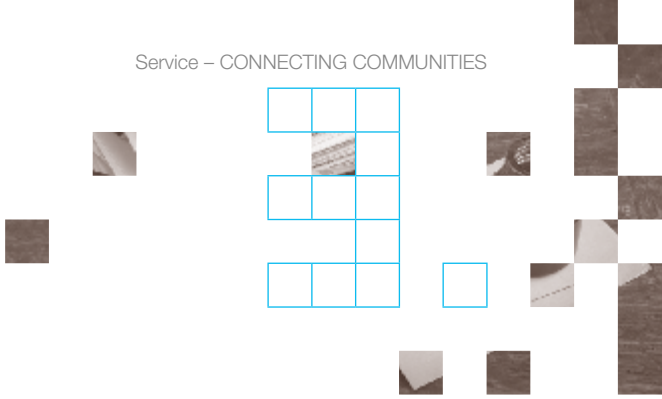
> *www.dke.de/de/ueber-uns/wir-in-zahlen*

DKE STANDARDS 2016

	Figures up to 31/12/2016		published in 2016	
	Number	**Pages**	**Number**	**Pages**
With VDE classification				
DIN standards	3.207	110,345	375	15.352
Drafts	1008	62,632	413	25,053
Manuscript procedure	–	–	1	12
VDE-Application guides	43	1,042	4	65
Without VDE-classification				
DIN standards	3.673	103,599	143	8,066
From the ETSI area	1,941	5,781	107	214
Drafts[1]	437	23,929	119	7,682
MV[2] from the ETSI area	–	–	140	280

1) The number of pages in the ETSI manuscript process (MP) was amended retroactively so that 2 pages are always entered per MP.
2) 347 without adjustments





DKE – MEMBERS OF THE STEERING BODIES

COUNCIL (LA) December 2016

PRESIDENT
Roland Bent, PHOENIX CONTACT GmbH & Co. KG, Blomberg

1ST VICE PRESIDENT
Prof. Dr. Dieter Wegener, Siemens AG – Corporate Technology, München

HONORARY PRESIDENT
Dr. Dietmar Harting, HARTING KGaA, Espelkamp

MEMBERS
Jürgen Carstens, Rohde & Schwarz GmbH & Co. KG, München
Rudolf Cater, Gustav Hensel GmbH & Co. KG, Lennestadt
Dr. Karl-Günther Dalsaß, Karl Dungs GmbH & Co. KG, Urbach
Dr. Joachim Damasky, Verband der Automobilindustrie (VDA), Berlin
Naemi Denz, VDMA Verband Deutscher Maschinen- und Anlagenbau e.V., Frankfurt am Main
Paul-Gerhard Elsing, Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV), Berlin
Prof. Dr. Ulrich Epple, RWTH Aachen
Dr. Friedhelm Franzen, BASF SE, Ludwigshafen
Dr. Michael Fritz, tcworld, Stuttgart
Stephan Glöckner, DB Energie, Frankfurt am Main
Christoph Hegemann, RWE Power AG, Frechen
Christian Herzog, BITKOM e.V., Berlin
Dr. Klaus Illgner-Fehns, IRT Institut für Rundfunktechnik GmbH, München
Ingolf Jakobi, Zentralverband der Deutschen Elektro- und Informationstechnischen Handwerke (ZVEH), Frankfurt am Main
Dr. Jens Jühling, BG Energie Textil Elektro Medienerzeugnisse (BG ETEM), Köln
Jörg Kaiser, VGB PowerTech e. V., Essen Uwe Kampet, BSH Hausgeräte GmbH, Berlin
Thomas Langer, Gesamtverband der Deutschen Versicherungswirtschaft e.V. (GDV), Berlin
Prof. Dr. Jörg-Uwe Meyer, MT2IT, Ratzeburg
Thomas Niemand, Westnetz GmbH, Dortmund
Dr. Wilhelm Otten, Evonik Industries AG, Hanau
Brigitte Pottkämper, DLR-PT, Bonn
Markus Reigl, Siemens AG – Corporate Technology, München
Dr. Max Reinhard, Infraserv GmbH & Co. Höchst KG, Frankfurt am Main
Dr. Ulrich Sandl, Bundesministerium für Wirtschaft und Energie, Berlin
Thorsten Schneider, Robert Bosch, Gerlingen-Schillerhöhe
Burkhard Schulze, Elektro-Schulze und ZEVH, Calvörde
Florian Spiteller, iSyst, Nürnberg
Dr. Andreas Starke, HARTING KGaA, Espelkamp
Claudia Tautorus, VdTÜV Verband der TÜV e.V., Berlin
Dr. Thomas Zielke, Bundesministerium für Wirtschaft und Energie, Berlin

CONSULTING MEMBERS
Ansgar Hinz, VDE Verband der Elektrotechnik Elektronik Inormationstechnik e.V., Frankfurt am Main
Christoph Winterhalter, DIN Deutsches Institut für Normung e.V., Berlin

DKE-BOARD OD DIRECTORS
Michael Teigeler, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main
Dr. Bernhard Thies, DKE Deutsche Kommission Elektrotechnik, Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main

ADVISORS
Dr. Reiner Aden, Essen
Thomas Dederichs, BDEW e.V., Berlin
Barbara Minderjahn, VIK Verband der Industriellen Energie- und Kraftwirtschaft e.V., Essen
Wolfgang Niedziella, VDE Prüf- und Zertifizierungsinstitut GmbH, Offenbach am Main

GUESTS
Jan Anders, Siemens AG, Erlangen
Dr. Norbert Fabricius, Karlsruher Institut für Technologie (KIT), Eggenstein-Leopoldshafen
Martin Gerstl, Robert Bosch, Gerlingen-Schillerhöhe
Karl Hiereth, Siemens AG – Control Products, Amberg
Wolfgang Hofheinz, Grünberg
Thomas Knebel, Bundesministerium für Wirtschaft und Energie (BMWi), Berlin
Dr. Wolfgang Leetz, Siemens Healthcare GmbH, Erlangen
Georg Luber, Siemens AG, Regensburg
Dr. Ulrich Spindler, Bonn Dr. Ralph Sporer, Siemens, Erlangen
Dr. Gerhard Steiger, NA Maschinenbau (NAM) im DIN, Frankfurt am Main
Prof. Dr. Hartwig Steusloff, IOSB Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung, Karlsruhe
Dr. Dirk Watermann, Kommission Arbeitsschutz und Normung (KAN), Sankt Augustin
Prof. Dr. Klaus Wucherer

TECHNICAL ADVISORY BOARD INTERNATIONAL AND NATIONAL COORDINATION (TBINK)

December 2016

CHAIRMAN
N.N.

VICE CHAIRMAN
Uwe Kampet, BSH Hausgeräte GmbH, Berlin
Thomas Niemand, Westnetz GmbH, Dortmund

ADDITIONAL MEMBERS
Johannes Aichner, Netze BW GmbH, Stuttgart
Jan Anders, Siemens AG, Erlangen
Dr. Ulrike Bohnsack, DIN Deutsches Institut für Normung e. V., Berlin
Prof. Dr. Ulrich Epple, RWTH Aachen, Aachen
Dr. Norbert Fabricius, Karlsruher Institut für Technologie (KIT), Eggenstein-Leopoldshafen
Bernd Gehrke, BSH Hausgeräte GmbH, Igensdorf
Karl Hiereth, Siemens AG – Control Products, Amberg
Haimo Huhle, ZVEI – Zentralverband Elektrotechnik- und Elektronikindustrie e. V., Frankfurt am Main
Dr. Jens Jühling, BG Energie Textil Elektro Medienerzeugnisse (BG ETEM), Köln
Dr. Wolfgang Leetz, Siemens Healthcare GmbH, Erlangen
Georg Luber, Siemens, Regensburg
Gesa Milbrett, Bundesministerium für Wirtschaft und Energie (BMWi), Berlin
Dirk Moritz, Bundesministerium für Arbeit und Soziales (BMAS), Bonn
Christian Rausch, Bombardier Transportation, Berlin
Dr. Andreas Starke, HARTING KGaA, Espelkamp
Dr. Gerhard Steiger, NA Maschinenbau (NAM) im DIN, Frankfurt am Main
Werner Sterk, Kommission Arbeitsschutz und Normung (KAN), Sankt Augustin
Dr. Marion Stoldt, Physikalisch Technische Bundesanstalt (PTB), Braunschweig

EX OFFICIO
Roland Bent, PHOENIX CONTACT GmbH & Co. KG, Blomberg
Ansgar Hinz, VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V., Frankfurt am Main
Dr. Gerhard Imgrund, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main
Andreas Landwehr, VDE Verband der Elektrotechnik Elektronik Informationstechnik e.V., Frankfurt am Main
Bernd Schwarzzenberger, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main
Dr. Ulrich Spindler, Bonn
Dr. Ralph Sporer, Siemens AG, Erlangen

ADVISORS
Heike Kerber, Forum Netztechnik/Netzbetrieb im VDE (FNN), Berlin
Dr. Klaus Kreß, VDE Prüf- und Zertifizierungsinstitut GmbH, Offenbach
Thomas Lämmle, Daimler AG, Sindelfingen
Dr. Michael Schaefer, IFA – Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung, Sankt Augustin
Professor Dr. Hartwig Steusloff, IOSB Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung, Karlsruhe
Dr. Bernhard Thies, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main

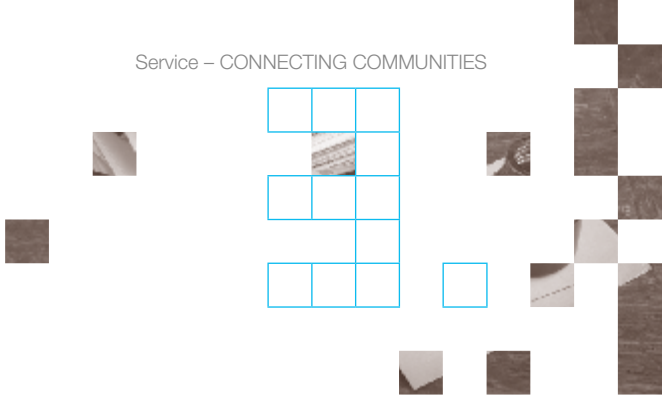
TECHNICAL ADVISORY BOARD (TBETSI)

December 2016

CHAIRMAN
N.K.

MEMBERS
Johannes Dietrich, Morpho Cards GmbH, Paderborn
Dr. Jochen Friedrich, IBM Deutschland GmbH, Mannheim
Dr. Michael Mahler, Robert Bosch GmbH, Leonberg
Michael Mowinski, Fraport AG, Frankfurt am Main
Josef Schuermann, JS Consulting, Langenbach
Dr. Klaus Vedder, Giesecke & Devrient GmbH, München

GUESTS
Martin Büchter, Deutsche Telekom AG, Bonn
Volker Gebauer, Bundesnetzagentur, Mainz
Christoph Wöste, Bundesnetzagentur, Mainz



TECHNICAL ADVISORY BOARD EVALUATION OF CONFORMITY (TBKON)

December 2016

CAIRMAN

Uwe Kampet, BSH Hausgeräte GmbH, Berlin

VICE CHAIRMAN

Dr. Klaus Kreß, VDE Prüf- und Zertifizierungsinstitut GmbH, Offenbach am Main

MEMBERS

Dr. Ingo Diefenbach, Westnetz GmbH, Dortmund
Michael Hingott, TÜV Süd Product Service GmbH, Frankfurt am Main
Theo Metzger, Bundesnetzagentur, Mainz
Dirk Moritz, Bundesministerium für Arbeit und Soziales (BMAS), Bonn
Heribert Schorn, Institute for International Product, Bonn
Martin Stadler, Siemens AG, Corporate Technology, München;

ADVISORY MEMBER

Dr. Lars Sitzki, TÜV NORD Southern Africa, Cape Town

EX OFFICIO

Dr. Bernhard Thies, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main

ADVISORS

Professor Dr. Thorsten Arnhold, R. STAHL GmbH, Waldenburg
Ralf Egner, DAkkS, Deutsche Akkreditierungsstelle GmbH, Frankfurt am Main
Sören Grumptmann, VDMA, Verband Deutscher Maschinen- und Anlagenbau e.V., Frankfurt am Main
Dr. Jörg Eduard Hartge, ZVEI – Zentralverband Elektrotechnik- und Elektronikindustrie e. V., Frankfurt am Main
Wolfgang Niedziella, VDE Prüf- und Zertifizierungsinstitut, Offenbach am Main

ADVISORY BOARD TECHNOLOGY

December 2016

CAIRMAN

Prof. Dr. Dieter Wegener, Siemens AG - Corporate Technology, München

MEMBERS

Jan Anders, Siemens AG, Erlangen
Dr. Markus Bautsch, Stiftung Warentest, Berlin
Dr. Thomas Becks, VDE VERBAND DER ELEKTROTECHNIK ELEKTRONIK INFORMATIONSTECHNIK e.V., Frankfurt am Main
Hermann Behrens, DIN Deutsches Institut für Normung e.V., Berlin
Dr. Thomas Benz, VDE VERBAND DER ELEKTROTECHNIK ELEKTRONIK INFORMATIONSTECHNIK e.V., Frankfurt am Main
Dr. Frank Brode, HARTING AG & Co. KG, Espelkamp
Jürgen Carstens, Rohde & Schwarz GmbH & Co. KG, München
Prof. Dr. Ulrich Epple, RWTH Aachen, Aachen
Dr. Jochen Friedrich, IBM Deutschland GmbH, Mannheim
Dieter Gödicke, VDMA Verband Deutscher Maschinen- und Anlagenbau e.V., Frankfurt am Main
Dr. Stefan Heusinger, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main
Haimo Huhle, ZVEI – Zentralverband Elektrotechnik- und Elektronikindustrie e. V., Frankfurt am Main
Dr. Klaus Illgner-Fehns, IRT Institut für Rundfunktechnik GmbH, München
Prof. Dr. Friedrich Jondral, Karlsruher Institut für Technologie (KIT), Karlsruhe
Uwe Kampet, BSH Hausgeräte GmbH, Berlin
Prof. Dr. Jochen Walter Kreusel, ABB AG, Mannheim
Dr. Wolfgang Leetz, Siemens Healthcare GmbH, Erlangen
Wolfgang Niedziella, VDE Prüf- und Zertifizierungsinstitut GmbH, Offenbach am Main
Thomas Niemand, Westnetz GmbH, Dortmund
Prof. Dr. Felix Sasaki, DFKI GmbH, Berlin
Dr. Volker Schanz, VDE VERBAND DER ELEKTROTECHNIK, ELEKTRONIK INFORMATIONSTECHNIK e.V., Frankfurt am Main
Dr. Berthold Schaub, ABB AG, Ladenburg
Dr. Ronald Schnabel, VDE VERBAND DER ELEKTROTECHNIK ELEKTRONIK INFORMATIONSTECHNIK e.V., Frankfurt am Main
Dr. Andreas Starke, HARTING AG & Co. KG, Espelkamp
P**rof. Dr. Hartwig Steusloff**, IOSB Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung, Karlsruhe
Michael Teigeler, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main
Dr. Bernhard Thies, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main
Dr. Chris Winkler, Siemens AG - Corporate Technology, München

GUESTS

Reinhold Pichler, DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE, Frankfurt am Main
Markus Reigl, Siemens AG - Corporate Technology, München

WE WOULD LIKE TO THANK ALL EXPERTS, STAFF MEMBERS AND MEMBERS OF THE STEERING BODIES FOR THEIR COMMITMENT.

Publisher

VDE ASSOCIATION FOR ELECTRICAL, ELECTRONIC & INFORMATION TECHNOLOGIES

Responsible for the daily operations of the

DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE

Stresemannallee 15 (VDE-Building)
60596 Frankfurt am Main

Tel: +49 69 6308-0
Fax: +49 69 6308-9863
E-Mail: *dke@vde.com*
Internet: *www.dke.de*

Photos

Page 29, big picture: Photorelease Stgt./Fotolia.com
Page 35, big picture: Redpixel/Fotolia.com
Page 36, big picture: djama/Fotolia.com
Page 37, big picture: sefias/Fotolia.com
Page 54, big picture: Anneke/Fotolia.com
Page 55, big picture: ldprod/Fotolia.com
All other pictures: DKE

The German interactive version of this DKE Annual Report can be found on our homepage

> *www.dke.de/jahresbericht2016*
(also available in the app)