

# GERMAN STANDARDIZATION PANEL (DNP)

Standardization Research,  
Policy and Promotion

## Indicator Report 2020

SUPPORTED BY DIN AND DKE

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## Message of Greeting

**by Thomas Jarzombek, MdB**

Federal Ministry for Economic Affairs and Energy  
Commissioner for the Digital Industry and Start-ups  
Federal Government Coordinator of German Aerospace Policy

## The German Standardization Panel 2020

Standards serve as state-of-the-art requirements for products and services in almost all areas of our lives. They help safeguard consumer protection by ensuring systems function as they should and by providing a high level of quality. The crucial importance of standards can also be seen in the current situation – in the efforts being made to tackle the COVID-19 pandemic.

Against this background, the European and international standards organisations, together with the German Institute for Standardization (DIN), have made numerous standards available free of charge. The aim is to enable safe and high-quality personal protective equipment and medical devices to be produced quickly, in order to prevent shortages. The Federal Ministry for Economic Affairs and Energy welcomes this initiative, which can serve to encourage many companies to adapt their business models and products and, by extension, help safeguard jobs. Standards are extremely important in making this initiative work as they ensure that products are safe and provide particularly small and medium-sized manufacturers with the knowledge they need for adapting their production.

In the current situation especially, DIN-SPEC, a special specification format that precedes formal standards, can serve as a valuable instrument for enabling new products and solutions to be developed and marketed quickly. European harmonised standards help to ensure high standards of safety and quality on the European market and to provide companies with easier market access based on the use of clear technical rules. It is therefore important to enable small and medium-sized enterprises to actively take part in standardisation work and to do so on a permanent basis. Earlier this year, the Federal Ministry for Economic Affairs and Energy launched a support incentive that provides SMEs with up to €40,000 to help them in their standardisation activities.

Standards are also a key element in the shift towards a greater level of digitalisation in processes of everyday life. At this time especially, they are helping to ensure that the economy can keep functioning and that people are able to keep their social contacts alive. Digitalisation is only possible if the necessary standards exist and are implemented by product manufacturers and infrastructure operators. Back in 2016, the companies surveyed by the German Standardization Panel considered the development of digital workplaces to be the highest priority and the creation of formal standards as the best way to ensure the required compatibilities.

The special section of the latest survey by the German Standardisation Panel looked at the role of standards in achieving the 17 UN Sustainable Development Goals (SDGs). Shortly after the SDGs were published, the international standardisation organisation ISO started to use these SDGs to guide its work and has been assigning published ISO standards to these goals ever since. For the first time, this year's special section of the survey also takes account of companies' perspectives on standardisation and the sustainable development goals. The individual findings made by the survey as well as thrust of the feedback overall show that companies today attach a high level of importance to the SDGs. Standardisation can play a considerable part in helping to achieve these goals.

Standardisation policy plays an integral role in German economic and innovation policy. The findings of the German Standardisation Panel serve as a basis for developing new scientific findings in standardisation research, which continues to be very limited in scope. The Panel already provides a reliable basis of data that all those responsible for and interested in standardisation policy can use to make robust assertions.

On behalf of the Federal Ministry for Economic Affairs and Energy, which has been the patron of the German Standardization Panel since 2016, I wish all readers of the Indicator Report 2020 useful insights.





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# **GERMAN STANDARDIZATION PANEL 2020**

**YEARLY INDICATOR REPORT  
FOR THE IMPORTANCE  
OF STANDARDS AND  
STANDARDIZATION  
ACTIVITIES OF GERMAN  
COMPANIES**

## SUMMARY

Based on representative data of German companies engaged in standardization and, increasingly, companies that only apply standards, this 2020 indicator report of the German Standardization Panel (German: Deutsches Normungspanel, acronym “DNP”) provides information on several aspects of standardization. The contribution of innovations to the competitiveness of businesses, as well as to other entrepreneurial dimensions, is undisputed. However, the benefits of standardization and the application of standards have not yet been fully recognized as a significant influencing factor – not least due to a lack of empirical investigations in this area.

For this reason, the German Standardization Panel was set up in autumn 2011 by the German Society for the Promotion of Research on Standardization (FNS). The FNS helped to promote research on topics and questions related to standardization in order to make qualitative assessments of aspects regarding standardization policy. Since 2019, the project is directly financed and supported by DIN and DKE. For the DNP, annual surveys are carried out to collect data on standardization activities and the application of standards by companies, which is then used to examine the impact of standardization and standards on various economic and social dimensions.

Such a systematic analysis requires reliable, detailed data which is collected through surveys carried out among the same economic players (persons or companies) on the same topic and over time. So-called panel data is particularly crucial for the exploration of the complex effects of standardization processes and the application of formal and informal standards on business success. This year, DNP data from seven survey waves were combined to establish a panel data set. Based on this unique data, insights were gained on changes in standardization activities and the application of formal and informal standards from 2013 to 2019. Due to a low number of observations, data from the pilot study in 2012 was excluded from the panel data set.



The here presented analyses validate last years' results and confirm initial trends. In addition, new insights into the trend towards standardization could be gained. The following core results were derived:

- 1 Formal standards, specifications and other technical rules developed by standardization organizations are by far the most important types of documents to the companies interviewed, as they promote legal certainty and facilitate market access for companies. Over time, a slight reduction of the importance of standards on national and EU-level can be noted, while consortia standards gain importance, especially on international, but also on EU-level.
- 2 Internal company standards are the third most important type of document and considered more relevant than informal consortia or de-facto standards. Internal company standards are applied by the majority of businesses surveyed, but particularly by large and innovative companies. They serve primarily to promote quality and productivity improvements. Over the last few years, internal company standards have gained in importance, specifically among medium-sized companies. Smaller companies use these standards to improve bargaining positions vis-à-vis suppliers and customers.
- 3 Informal consortia and de-facto standards are primarily relevant for the realization of technical interoperability. Participation in consortia is mainly motivated by the high speed of processes, while the type and number of users, as well as the possible influence on government regulation is perceived as an advantage in formal standardization.
- 4 ISO 9001 (quality) and ISO 14001 (environmental) certifications are already widespread among survey participants and first certifications in this field are rare. In contrast, ISO 50001 (energy efficiency) and ISO/IEC 27001 (IT-security) certifications are on the rise. A potential saturation of ISO 50001 certifications will have to be monitored in the next surveys.
- 5 There is considerable consistency between the relevance of different sustainable development goals for standardizing companies and the amount of existing standards that SSOs attribute to these goals. Formal standards and in particular harmonized European and international standards are considered to have a major positive influence on the achievement of sustainability goals.
- 6 The international harmonization of standards and certifications continues to play a major role in exports to the US and China. Barriers to trade have grown since 2013 and 2014. Market harmonization based on international standards clearly remains the preferred option for most companies.

# CREATING AN EMPIRICAL BASIS FOR THE EXPLORATION OF THE GERMAN STANDARDIZATION LANDSCAPE

## Introduction

Innovation is commonly regarded as a source of growth and prosperity. Many factors contribute to the transformation of ideas into successful market solutions. Standardization is considered one of these factors, which is also underlined by the fact that in 2018 it was included as such in the OECD's Oslo Manual<sup>1</sup> for the first time. Panel data, i.e. data that is gathered on a regular basis, facilitates causal inference and is therefore necessary for the scientific analysis of the effects of standards. For example, the 2012 survey revealed that companies active in standardization invest more in innovations and realize their innovations with higher success.<sup>2</sup> This correlation, however, does not necessarily imply that participation in standardization positively affects the innovativeness of companies. Rather, innovative companies could be more likely to become active in standardization. In order to define directions and sizes of effects, companies' activities have to be observed over a longer period of time.

Inspired by the innovation survey carried out among EU Members by the European Commission which started in the early 1990s,<sup>3</sup> the DNP generates a comprehensive collection of empirical data containing a large amount of information on businesses, which can be used for the exploration of central issues in standardization research.

## Goals

The data generated by the DNP forms a basis for scientific research on the standardization activities of companies, the implementation of standards, and the effects of standards on entrepreneurial success. The survey results can also be used to develop strategies for the involvement in European and international standardization, as well as to articulate national business interests, among others, towards the European Commission.

An additional goal of the German Standardization Panel is to address current standardization policy issues and to evaluate measures taken. The last survey waves addressed the role that standards and standardization play in the public sector, as well as the consequences of digitalization and digital networking also in the Industry 4.0 area for standardization. In addition to that, the data allows for the identification of new trends.

Finally, the panel raises awareness of the importance of standardization for business-

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<sup>1</sup> OECD and Statistical Office of the European Communities (2018): "Oslo Manual. Guidelines for Collecting and Interpreting Innovation Data, 4th Edition", <https://www.oecd.org/science/oslo-manual-2018-9789264304604-en.htm>

<sup>2</sup> Blind, K. and Rauber, J. (2013): „Normung als attraktive Plattform für innovative Unternehmen“, DIN-Mitteilungen Dezember 2013, S. 26 – 29

<sup>3</sup> This is a reference to the panel based on the EU's Community Innovation Surveys (CIS), which repeatedly interviews the same companies about their innovation activities, successes and problems.

ses which have not yet used formal standards or have not yet been active in standardization, thus motivating and encouraging increased participation. This requires a wide dissemination of the survey results via reports such as this one. The DNP is designed to help achieve these goals of standardization research, policy, and promotion.

## Heuristic model

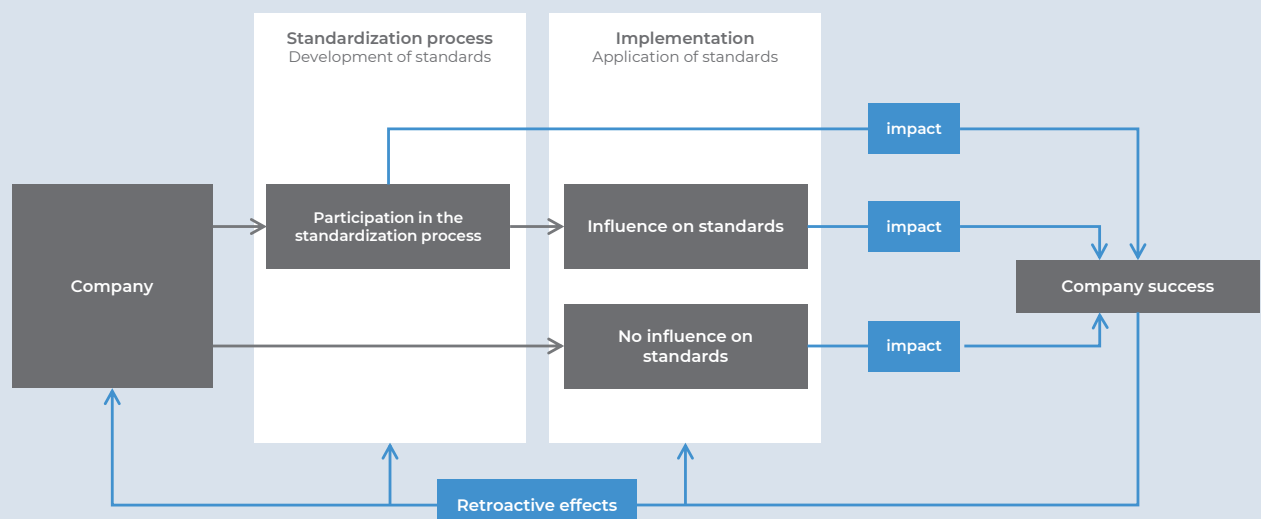
Questions asked in the annual survey fall into two categories: core questions and questions related to a specific subject. The core questions are conceptually based on a heuristic model (see figure 1). This model is comprehensive, allowing for the integration of a broad array of topics and questions. It illustrates the multidimensional links between participation in the standardization process, the implementation of formal standards and corporate success.

The survey measures standardization activities in dimensions that describe their nature and scope, e.g. time required, necessary human resources, participation in standards committees, etc.. The implementation of standards is reflected in dimensions of cost and benefit. Apart from this, the DNP's long term goal is to assess the impact of standardization, as well as the application of standards on business success.

A number of questions can be asked in this context: Does participation in the standardization process increase the success that is achieved through the implementation of formal standards? Does standardization have a direct impact on corporate success or is the impact indirect, e.g. through networking opportunities? Which dimensions of success are influenced by standardization? Do insights gained by participating in standardization mainly apply to those self-developed standards, or is there a more general learning process? What does this learning process look like? How do company-specific characteristics influence company success through standardization work? Does the impact of standardization work vary depending on

**Figure 1**

**Heuristic model of the German Standardization Panel**



industry or company size?

The waves of the surveys from 2013–2015 provided initial evidence to answer the last two questions, the more complex questions, e.g. regarding learning effects, however, can only be answered through an analysis over a period of time, which includes a measure for business development.

## Realization

The eighth survey wave of the German Standardization Panel was launched on 14 October 2019, World Standards Day. The DNP is a project that is conducted by the Chair of Innovation Economics at Technical University Berlin and financed and supported by DIN and DKE. In 2019, the Federal Ministry of Economic Affairs and Energy (Bundesministerium für Wirtschaft und Energie, BMWi) has again thankfully accepted the patronage for the DNP. By doing so, the BMWi is emphasizing the significance of standards not only for companies but for the economy as a whole.

A total of more than 22,000 experts were contacted. The number of usable questionnaires is around 1000, which means that the response rate of just under 4.5% does not deviate greatly from the level of previous years. A high response rate for the special section shows that the topic of sustainability has met great interest.

In total, information from 162 companies that had already participated in the surveys in 2013 and 2014 was included. Based on this, a balanced panel data set was created, allowing for comparisons between the special sections of 2013 and 2014. Comparisons between the samples of all surveys from 2013 to 2019 were made to obtain a detailed overview over the development of indicators over the entire survey period. With the aim of enabling more robust comparability and a sufficient degree of representativeness, the responses of the companies were weighted according to company size and assigned industry. The target distribution was based on size and industries of roughly 10,000 companies active in standardization at DIN.

On the basis of this unique data set, it is possible to gain insights about changes in standardization behavior and the application of standards by companies over time.

## Composition of the sample in 2019

In this report, industry, company size as well as research and innovation activities are the main differentiation criteria used to structure the results and highlight individual characteristics. This year's sample composition is roughly the same as in previous years, confirming the panel's general sample structure of experts and companies.

Of the nearly 1,000 answers used in the analysis, 67% represent companies respectively groups of companies. 33 % of all answers were given by experts who answer from the perspective of a representative company in their industry. Respondents from smaller companies (up to 50 employees), were mostly active in upper management positions. At larger companies, participants worked in R&D or QM departments. A specialized standardization background was most frequently stated by participants in companies with more than 1,000 employees. A total of 26% of the participants were executive managers, 23% worked in R&D departments, 12% worked in dedicated standardization departments and 11% had a background in

quality management.

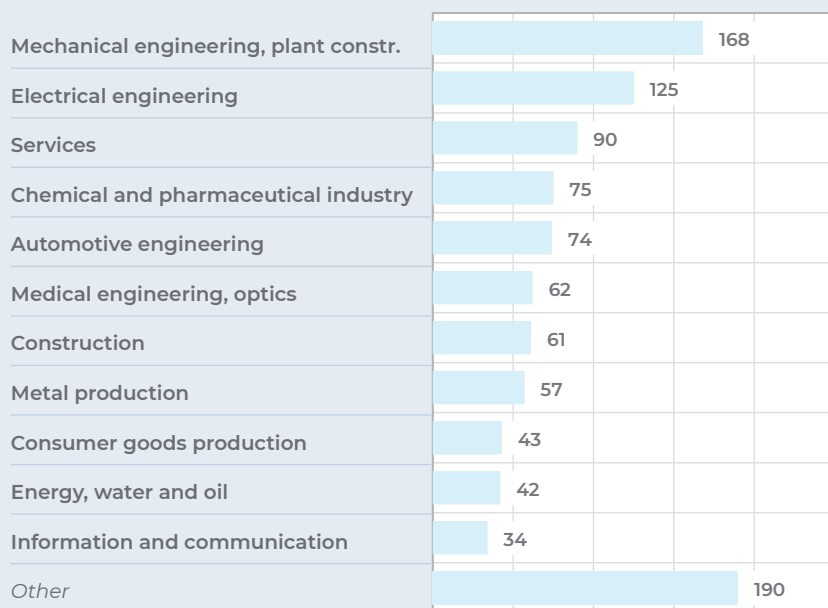
#### Location & size

As in previous years, the main group of companies responding to the survey were German companies. With just under 80%, they clearly represented the largest group. Most foreign companies had their headquarters in Europe (12%), followed by the USA (5%) in third place. The size distribution of participating companies has remained relatively stable since 2013. Each group (classification: <50, 50 - 249, 250 - 999, 1,000+ employees) contains about one quarter of the participating companies. It was therefore also possible to represent the view of small and medium-sized enterprises (SMEs, <250 employees), which account for 51% of the sample. While the proportion of smaller companies was highest in the service sector (> 50%), answers from groups of companies with 1,000+ employees came mainly from industry, in particular automotive engineering, the chemical and pharmaceutical industry or electrical engineering.

**Figure 2**

Number of participants in the 2019 survey by industry. N=1,021, unweighted sample.

#### Number of participants by industry



#### Industries

The composition by industry<sup>4</sup> has changed only slightly compared to previous years. Most of the participating companies (approx. 16%) are active in mechanical and plant engineering, followed by 12% electrical engineering, 9% services and 7% each from the chemical, pharmaceutical, rubber and plastics industries (hereinafter referred to as "chemical and pharmaceutical industry") and automotive engineering.

<sup>4</sup> Industries according to the classification by the Federal Statistical Office of Germany, 2008 edition.

In contrast, only 3% of companies were active in the information and communication industry. Compared to the 2018 survey, the proportion of participants from the electrical engineering sector has decreased slightly. In contrast, more companies active in the construction or metal production participated.

**R&I** The innovation activities of companies increased slightly compared to the previous year's survey. For example, 77% of the 859 respondents stated that they had introduced product or process innovations in the previous year, whereas this figure was as high as 71% in the 2018 survey (n=842). A comparison of the weighted samples also confirmed a slight increase. A total of 62 % of 858 companies carried out research activities, of which 48 % cooperated with external research institutes. Such activities were much more common among larger enterprises than among smaller ones. The proportion of enterprises which introduced innovations, conducted research or entered into research and innovation cooperations was lower for SMEs (71 %) than for larger enterprises (81 %). Consumer goods manufacturers most often stated that they had introduced innovations (90 %), followed by automotive engineering (88 %) and electrical and mechanical engineering (87 % each). The highest proportion of researching companies was in the chemical and pharmaceutical industry (77 %), automotive engineering (74 %) and electrical engineering (72 %); this number was lowest in the service industry (24 %). Cooperation with external research institutions was most common for medical and automotive engineering companies (59 % each).

**Export** Of the nearly 600 companies that reported on their export activities, more than half exported to the USA (53%) or Asia (58%). The average share of exports in the total turnover of the responding companies was roughly 35% in 2019. This number was 10% for exports to Asia and 7% for exports to the USA. As in previous years, the sectors with the highest export shares were mechanical and plant engineering (53%), followed by medical engineering (49%), metal production (46%) and automotive engineering (46%). Mechanical and plant engineering companies exported most to Asia (18%), followed by automotive engineering (16 %) and electrical engineering (14 %). The largest corresponding share of exports to the USA was recorded in the consumer goods sector (14 %), medical technology (12 %) and automotive engineering (11 %). The least exports are in the service sector and construction.

## THE IMPORTANCE OF STANDARDS AND SPECIFICATIONS

In its first core part, the annual survey of the German Standardization Panel collects the assessments of companies from different industries of the importance of standards. The survey distinguishes between five types of standards: Formal standards such as the DIN standards, technical rules or specifications (e.g. DIN SPEC), informal consortia standards, de-facto standards, and internal as well as external company standards. With the exception of the latter, their importance is measured for the national, European and international level. In the case of formal standards, for example, this refers to DIN standards (national), the European standards EN (CEN, CENELEC or ETSI), and ISO standards (international).

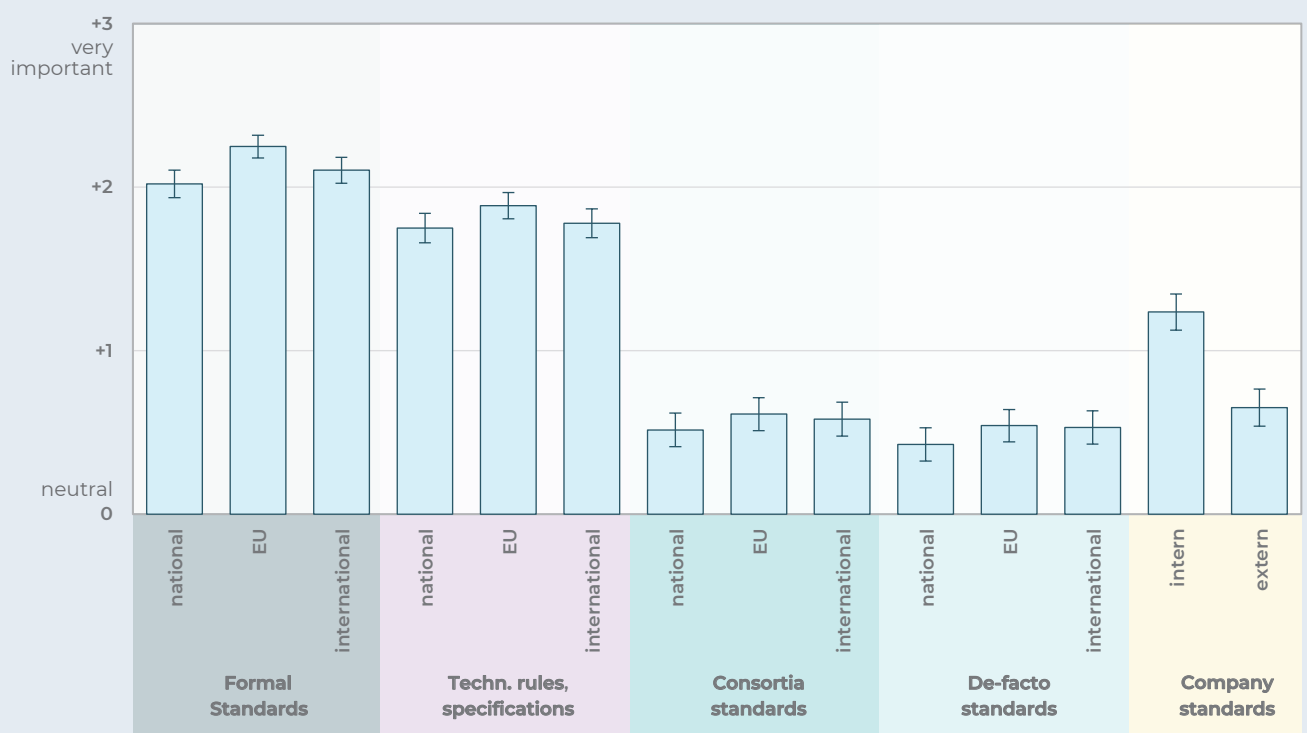
### Formal standards remain most important type of standard, especially at European level

As in the surveys of previous years, formal standards and technical rules or specifications continue to be the two most important types of standards for experts active in standardization in 2019 (see Figure 3). While this is true irrespective of industry and research and innovation activities, on average, the importance of for-

**Figure 3**

#### Importance of standards

Average assessment of the importance of standards at different regional levels. Rating scale from -3 (very unimportant) to +3 (very important). N=1,021; 95% confidence intervals



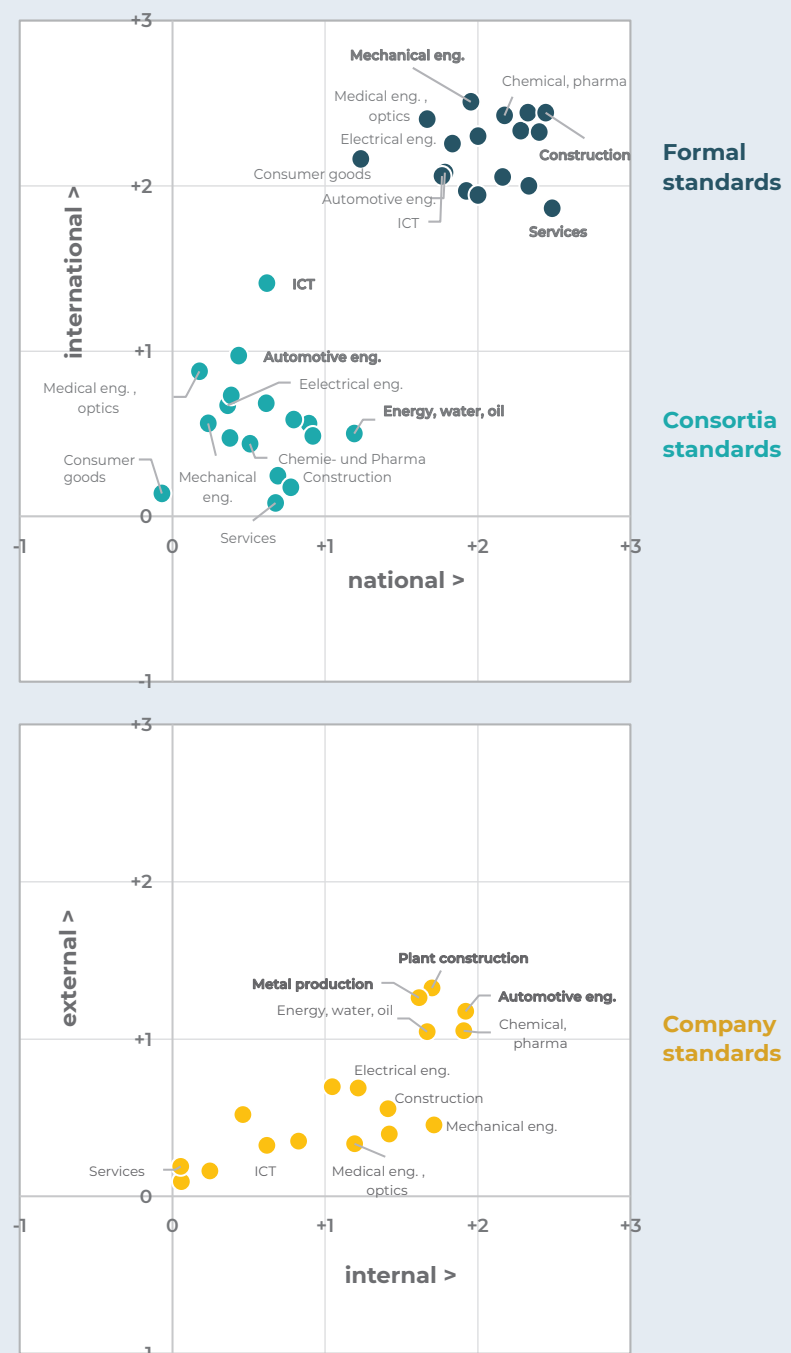


mal standards increases with the with company size. The assessment by SMEs and large companies differs most clearly with regard to international standards and internal company standards. On average, companies with more than 1,000 employees, which have introduced product or process innovations, or conduct internal research and development, attach greater importance to internal company standards. The vehicle construction, chemical and pharmaceutical industries stand out in particular. External company standards, i.e. those standards that are often set by companies downstream along the value chain, are especially important in the plant construction, vehicle construction and metal production industry. In these areas, they are valued for improvements in quality and productivity, as well as for their role in

**Figure 4**

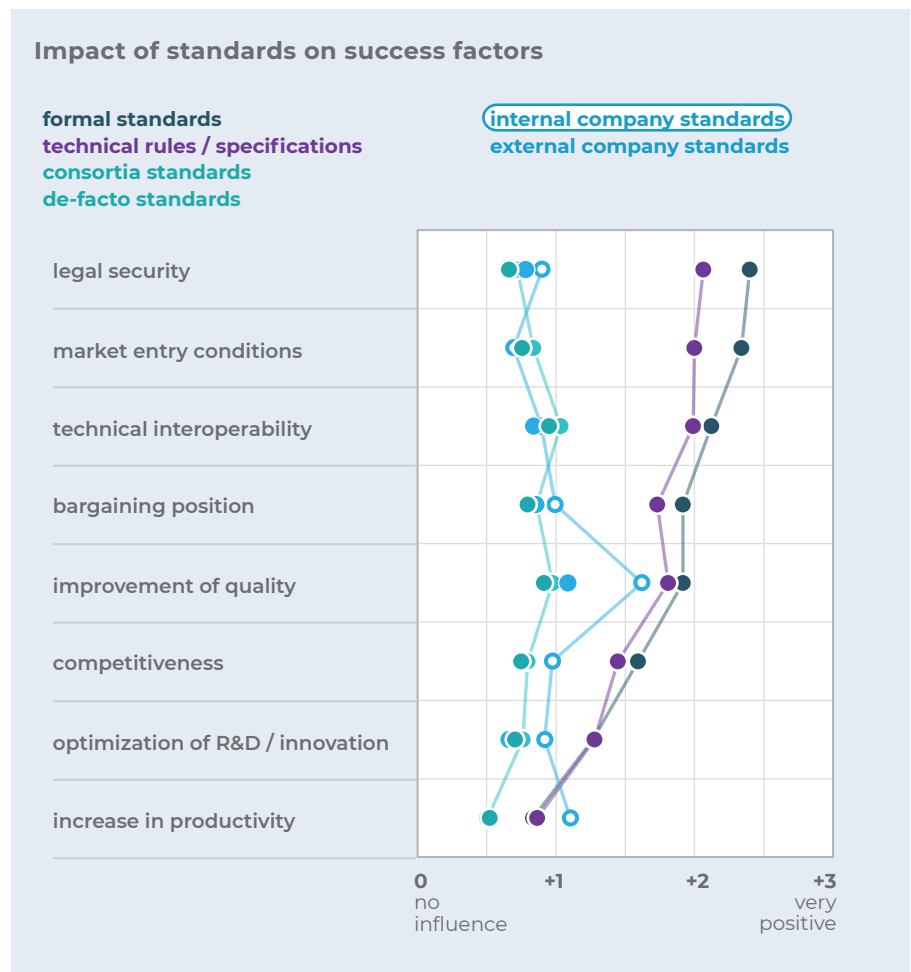
Importance of national and international formal standards and consortia standards, as well as internal and external company standards by industry. -3 (very unimportant) to +3 (very important). Total N=1021, industries N = 34 to 128.

### Importance of standards by industry



**Figure 5**

Average estimate of the impact of different standard types on success factors. Basis N=800. -3 (very negative) to +3 (very positive).



strengthening negotiating positions towards suppliers and customers. In comparison, de-facto standards and informal consortia standards are on average rated as less important. They play a particularly important role in achieving technical interoperability for large, innovative companies that are part of multinational corporations.

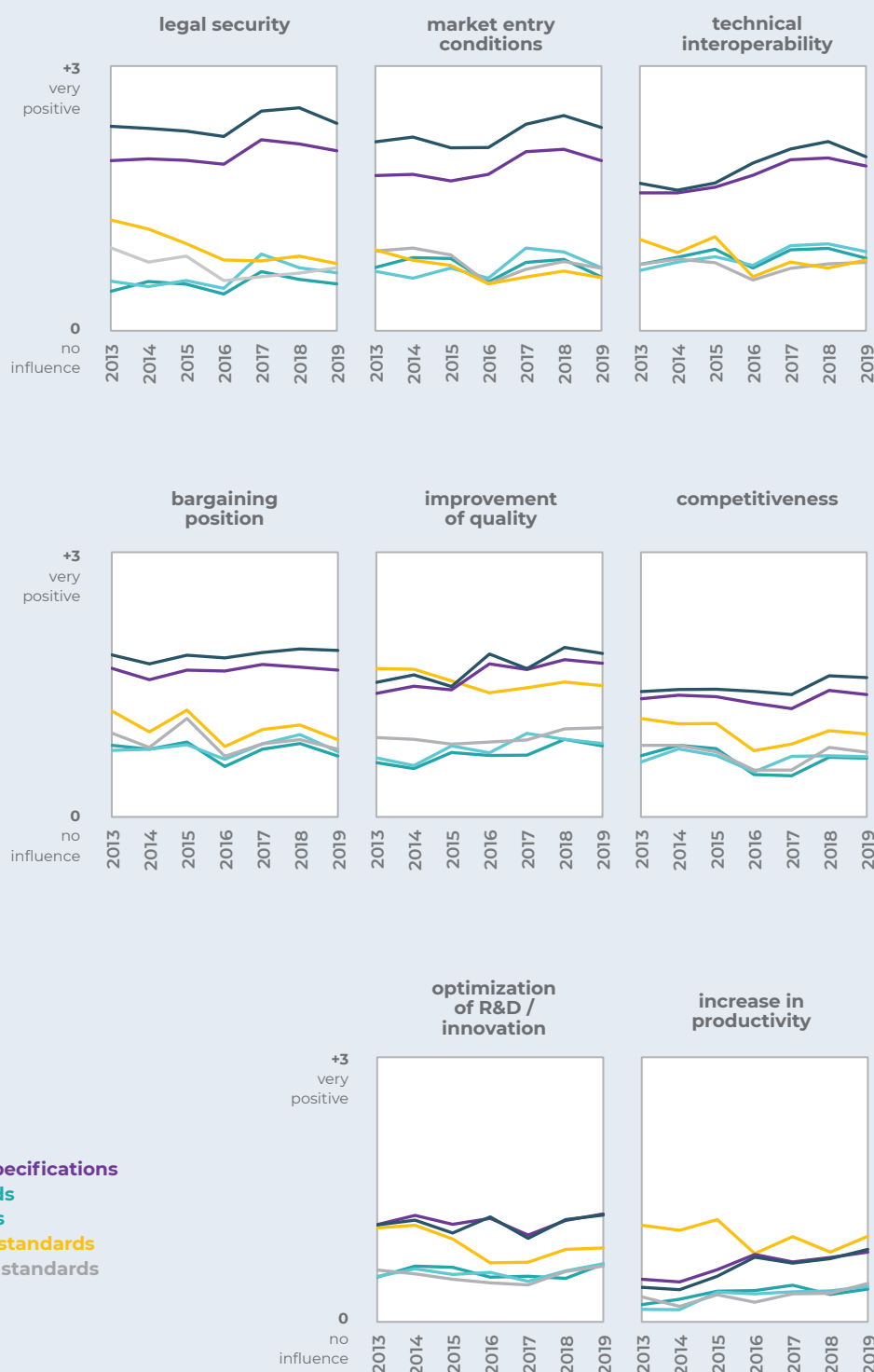
On average, the participants attach the greatest importance to European formal standards and, in general, to all types of European standards. In contrast to other sectors, national standards for construction and services play a greater role than international standards. The sectors with the clearest international orientation are optics and medical engineering, which consider formal standards to be most important at this level. In contrast, companies from the information and communications sector attach great importance to international consortia standards. In this year's survey, only manufacturers of consumer goods consider such standards to be rather unimportant.

Compared to the previous year, the average estimates based on the weighted samples and the balanced panel sample have not changed significantly. Since the start of the surveys in 2013, above all international standards have gained in importance. In particular, international de-facto standards were estimated to be more important in 2019 than six years earlier. Similarly, the importance of European de-facto standards has been rated continuously higher since 2017 than in the three surveys before. At national level, all types of standards have lost some of their importance, including company standards.

Figure 6

## Changes in the effects on company success factors 2013 - 2019

Average assessments of the effects of different types of standards on company success factors. -3 (very negative effect) to +3 (very positive effect). Weighted samples 2013 - 2019. Total N=6,766



## Formal standards and technical rules, specifications have greatest positive effect on company success

Overall, the conclusions from previous surveys can be confirmed, stating that formal standards have a much stronger influence on (business) success factors than consortia or de-facto standards is confirmed. Companies see such advantages especially for aspects that are related to transactions costs created by use and access to markets. For example, formal standards as well as technical rules and specifications are considered to have a significantly higher influence than other types of standards in terms of ensuring legal certainty, meeting formal and informal market access conditions, achieving technical interoperability and bargaining positions vis-à-vis suppliers and customers (see Figure 5).

Company standards play a more important role when considering factors that affect internal company processes, and are primarily related to increases in quality and productivity. Further aspects where company standards are relevant relate to the optimization of R&D, innovation activities and competitiveness. Such dichotomous assessments are in line with the results from a previous survey on the macroeconomic benefits of standardization<sup>5</sup>, which also came to the conclusion that internal company standards are important for the success of internal company processes and that formal standards are particularly important for successful operation on the market. The latest surveys however indicate that formal standards (and technical rules and specifications) are increasingly assuming both functions (Figure 6).

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<sup>5</sup> DIN Deutsches Institut für Normung e. V. (2000): „Gesamtwirtschaftlicher Nutzen der Normung: Zusammenfassung der Ergebnisse. Wissenschaftlicher Endbericht mit praktischen Beispielen“, Berlin, Wien, Zürich: Beuth Verlag.

## STANDARDIZATION ACTIVITIES

### Participation increases, particularly at the international level

The second core part of the survey deals with the external and internal standardization activities of companies. A total of 887 company and sector representatives provided information on participation in standards organizations at various regional levels (DIN and DKE at national level, CEN, CENELEC and ETSI at European level and ISO, IEC and ITU at international level). The share of enterprises claiming to be active in formal standardization either at national, European or international level is slightly higher than in the previous year at just under 94%. A total of 74 % were active at supranational level, 87 % at DIN or DKE. More than half of the companies (54 %) were also represented in consortia. While almost all (99 %) very large companies with 1,000 or more employees were active in at least one committee of a standards institute, this proportion was 86% for very small companies (<10 employees) to 88% for large companies (250 - 999 employees).

While most of the surveyed companies participate in standardization at national (German) standard-setting organizations, the prevalence of participation at European and international level is much lower. To a certain extent, this can be attributed to the system of representation of national bodies in European and international mirror committees. Almost 66% of the respondents are active in committees at both national and supranational international level. Above all, very large companies from the vehicle construction, electrical engineering, as well as the chemical and pharmaceutical industries are active at all regional levels. Among these, the proportion of companies that are such strongly represented in standardization was almost 50%.

### Diffusion of standards and influence on government regulation are main benefits of formal standardization

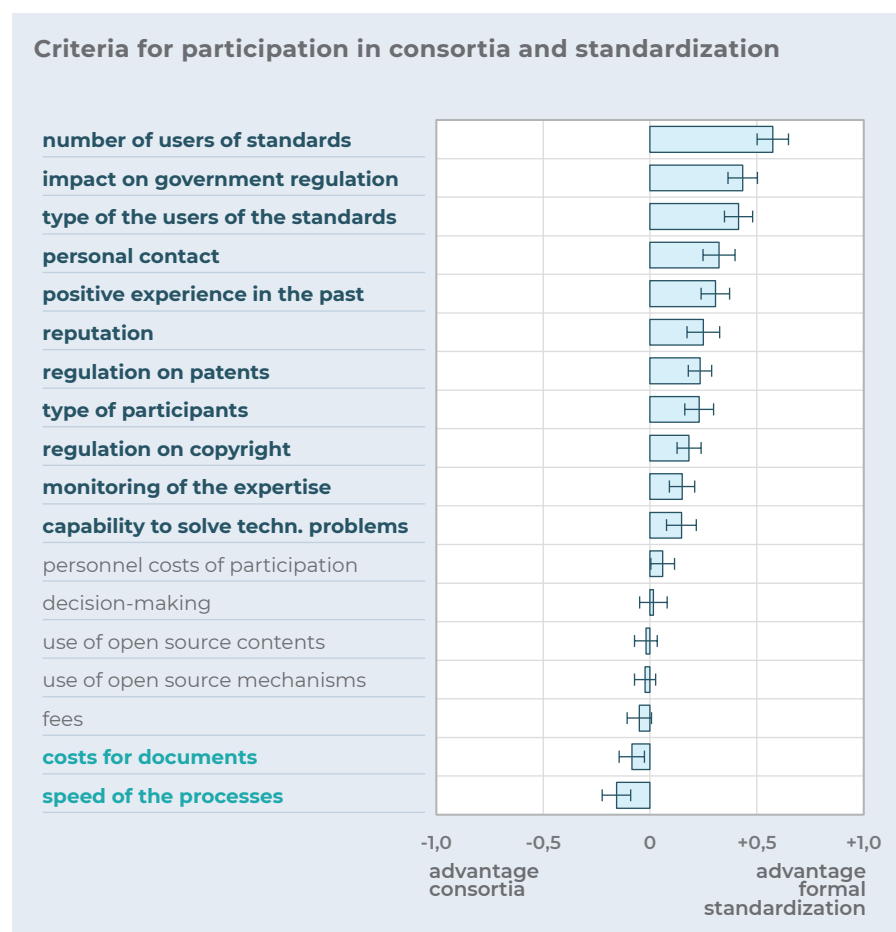
Comparing the criteria which speak in favor of participation in formal standardization versus consortia, this year's results largely confirm those of previous surveys. In line with the more pronounced participation in formal standardization in the sample, the positive assessments of participation in standardization predominate.

The strongest arguments in favour of standardization for companies continue to be the wide diffusion and strong influence of formal standards (Figure 7). The most important criterion for participation in standardization is clearly the large number of users of formal standards. Second and third place is given to the influence that can be exerted on government regulation and the type of user of these standards. Other clear advantages of activity in formal standard setting organizations is their high reputation, better or more contact to other participants, and positive experiences in the past. Furthermore, patent policies (such as licensing conditions for standard-essential patents) and copyright policies, as well as the ability to solve technical problems, speak in favour of standardization.

In all surveys, two criteria are seen as advantages for standardization in consortia: faster processes and lower costs for documents. Whereas companies are more inclined to participate in consortia because of lower fees, personnel costs associated with participation in standardization processes speak in favor of formal standardization.

**Figure 7**

Assessment of the extent to which different criteria influence participation in consortia and formal standardization  
-3 (advantage consortia) to +3 (advantage formal standardization). N=599



Main criteria in favor of consortia, such as the speed of the processes, and those in favour of standardization, such as reputation and influence on state regulation, had converged more and more in the years 2016 to 2018. A further decline of the positive assessment of formal standardization and convergence towards an assessment equal to that of consortia could not be confirmed in this survey; rather, the distinction has consolidated as shown in Figure 7.

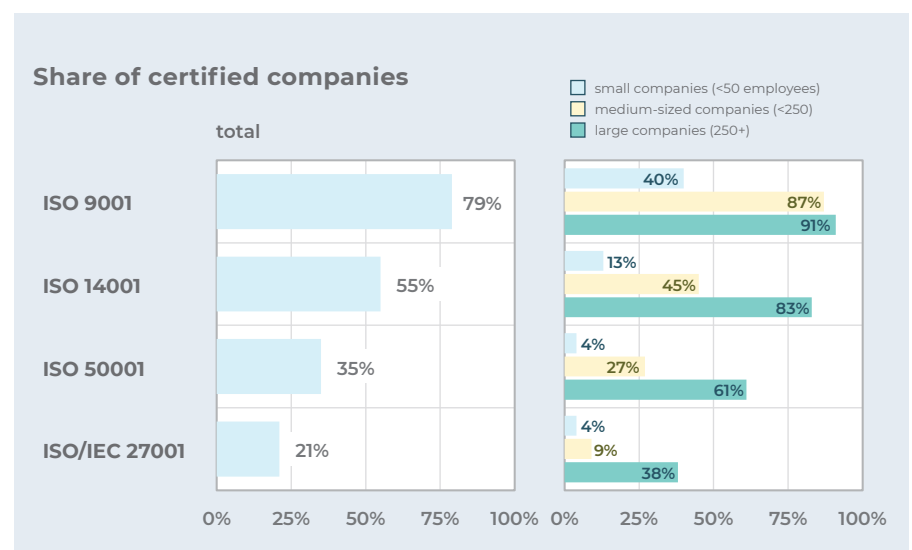
## CERTIFICATION OF MANAGEMENT SYSTEMS

### Trend towards certification of energy management systems continues

As in the previous surveys, the participating companies indicated whether they were certified according to certain standards in the previous year of the survey (2018). In that case, they were also asked to indicate in which year the initial certification took place. In total, 879 companies provided information on these questions.

**Figure 8**

Share of companies certified according to major standards  
(2018, yes/no, N>566).



As in the previous surveys, the majority of companies stated, by 2018, to have been certified according to at least one of the major quality, environmental, energy or IT security management system standards (see Figure 8). Most widespread was the quality management system standard ISO 9001, with 79 % companies certified. Moreover, more than half (55 %) of all companies stated to have implemented an environmental management system certified according to ISO 14001. The standard with the strongest growth in certifications in the last years, energy management systems standard ISO 50001, achieved a level of 35 % certified companies in 2018. As expected, there was a significantly higher share of large companies certified.

### Certification according to ISO/IEC 27001 still most relevant for large companies, ICT and automotive engineering

The biggest differences between large and small companies and across industries could be observed for IT security management, where less than 10 % of SMEs were certified according to ISO/IEC 27001. Certifications according to ISO 50001 and ISO 14001 were just as infrequent among small companies, while a third to half of all medium-sized companies were certified according to these standards. Certification of quality management systems according ISO 9001 was more prevalent among



small companies (40 % certified), and among medium-sized companies (87 %). Innovative companies were also more frequently certified - especially according to ISO/IEC 27001.

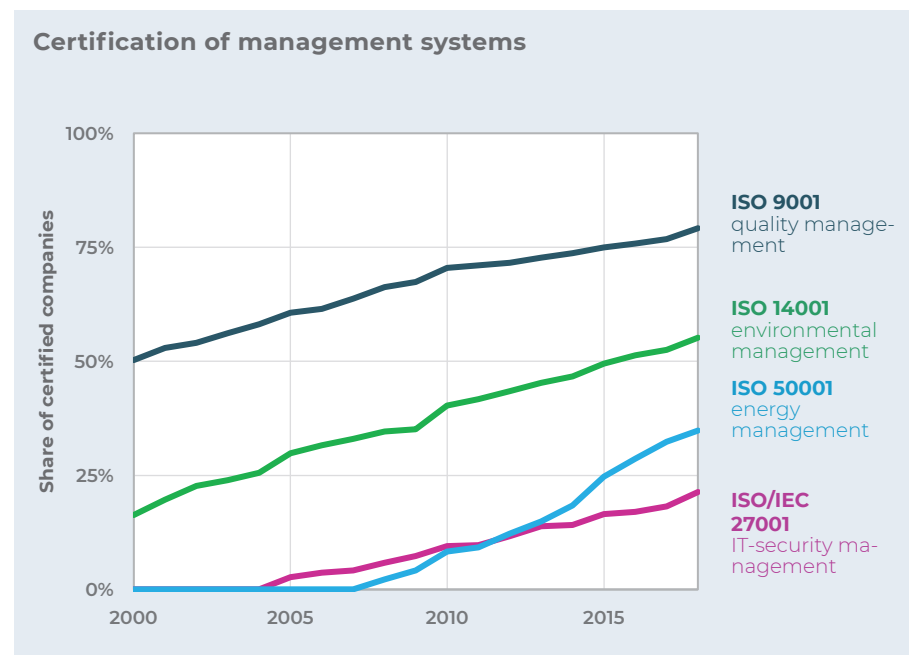
Particularly companies from the chemical and pharmaceutical industries, electrical, mechanical and automotive engineering and metal production were certified, while this was significantly less the case for service companies. Companies from the chemical and pharmaceutical industry (n=43) were in 70 % of all cases certified to ISO 50001, significantly more often than companies from any other sector. The certification of IT security management systems could be observed especially in the ICT and automotive industry. In these industries, the share of certified companies was 45 % (ICT) and 46 % (automotive engineering).

More than 251 companies provided information on certification according to other management system standards. As in the previous year, the largest share (n=69) could be attributed to testing and calibration laboratories and certification bodies certified to ISO/IEC 17025, ISO/IEC 17065 or ISO/IEC 17020. On the other hand, industry-specific quality management systems, especially in the field of medical devices (ISO 13485, n=32) and in the automotive industry (ISO/TS 16949, n=22), as well as certifications of occupational health and safety management systems according to OHSAS 18001 (n=19) played an important role.

**Figure 9**

Development of share of companies certified according to management system standards or predecessors thereof (estimates based on cumulative initial certifications, data from 2019).

ISO 9001: N=564, ISO 14001: N=311, ISO 50001: N=159, ISO/IEC 27001: N=88)



The trend towards more certifications of energy management systems, which was diagnosed in last year's report, can again be seen in the data on initial certifications collected this year. Figure 9 shows a slightly stronger increase in initial certifications according to ISO 50001 compared to ISO 9001, ISO 14001 and ISO/IEC 27001. In contrast to the previous year, no decrease in initial certifications could be observed.

## STANDARDS, STANDARDIZATION AND THE UN SUSTAINABLE DEVELOPMENT GOALS

The special section of the 2019 survey investigated the relationship between standards, standardization and the United Nation's sustainability goals. These 17 "Sustainable Development Goals" (SDGs) were adopted by the UN member states in 2012 and are intended to help pursue sustainable development at the economic, ecological and social levels, initially for a period of 15 years from 2016 to 2030. The goals are designed for a regional and global scale, in which, in addition to the political dimension, concrete implementations at the corporate level are of critical importance.

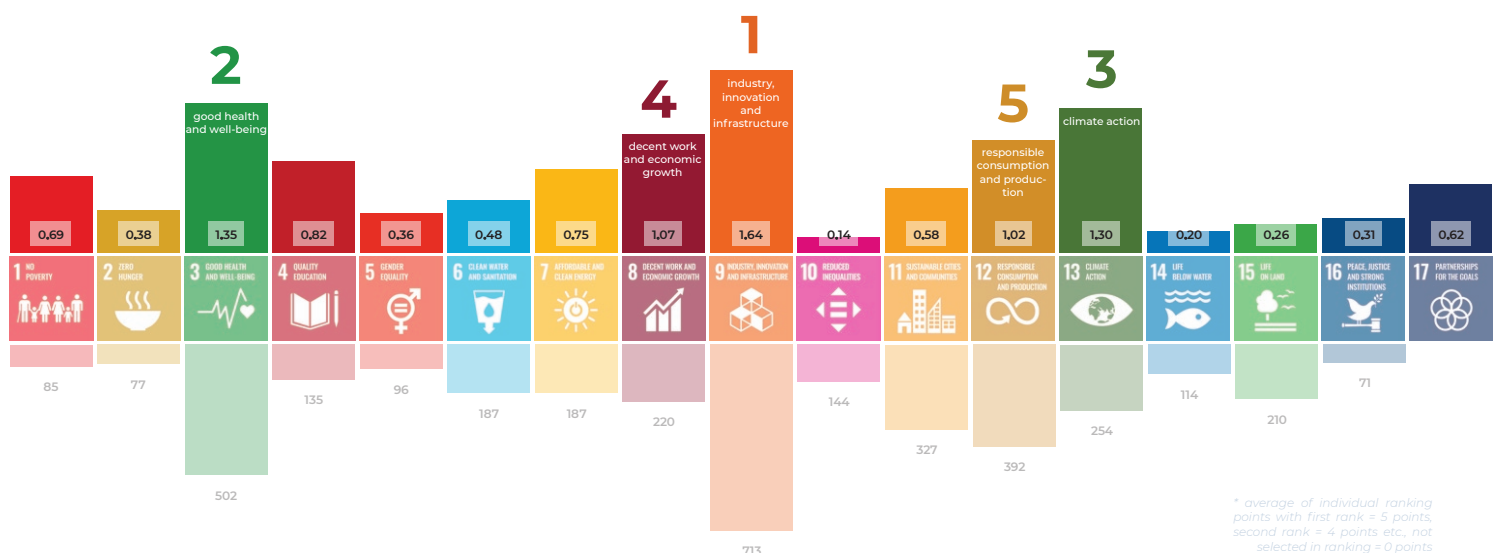
The extent to which companies take sustainability goals into account depends on how much they coincide with corporate goals and how firmly sustainability is anchored in corporate culture. External influences, such as social expectations or concrete regulatory measures, can play an equally important role. In this regard, voluntary standards often occupy a central position, as they shape concrete designs and implementations of processes and products. Through the standardization process, companies have the opportunity to develop and agree on their own set of rules that keep pace with technical progress, but also take into account strategic goals that may go beyond the goals of individual companies. If standards specifically take sustainable development goals into account, they have the potential to influence the sustainability of entire industries from regional to a global level.

The topic of standards, standardization and SDGs has already received some consideration from national and international standards organizations. The German Standardization Panel is now examining for the first time the corporate perspective

### Ranking: Which Sustainable Development Goals are most relevant for your company or industry?

ranking points\*, N=1,021

Bottom: number of ISO standards per SDG, assigned by ISO. Source: [www.iso.org/sdgs.html](http://www.iso.org/sdgs.html)



on this topic. The survey initially focuses on the role that sustainability goals generally play for companies and the contribution that standards make to achieving them. In addition, the companies' assessments of untapped potentials are surveyed: Can standards and standardization support companies better in achieving their sustainability goals? What are concrete suggestions for improvement?

## Industry, innovation and infrastructure, health and climate action are most relevant goals

As a first step, the relevance of the sustainability goals for standardizing companies was examined. Almost 1,000 participants selected a maximum of five most relevant goals for their company or industry and ranked them first to fifth. Goals were defined as "relevant", if the company or industry makes a particular contribution to them, or if changes introduced by a company or industry generally have a pronounced impact on their achievement.

The sustainability goal "industry, innovation and infrastructure" was voted into first place by 149 companies (15.5%), followed by "good health and well-being" (14.8%) in second place and "climate action" (11.3%) in third place. This ranking was also confirmed by a ranking point system\* (see Ranking, p.24) that took into account the weighted second to fourth ranks. The goals "decent work and economic growth" and "responsible consumption and production" were often ranked fourth and fifth. Other goals that were often considered relevant were "quality education" and "affordable and clean energy". The prioritization of the goals revealed certain industry-specific differences. For example, respondents from the automotive engineering and metal industries in particular chose the goal "industry, innovation and infrastructure", while "good health and well-being" was the most important sustainable development goal for medical engineering companies. The goals that were overall least often selected were "reduced inequalities", "life below water", "life on land", "peace, justice and strong institutions", and "gender equality". This reflects the companies' tendency to see their contribution more in economic and technical areas than in social issues, while environmental goals were dominated by SDG 13, "climate action".

We compared the corporate perspective on the relevance of sustainable development goals with the number of international standards that ISO assigned to each SDG. As the ranking on the previous page shows, the comparison resulted in a rather congruent picture. The output of international standardization has a similar focus on industry, innovation and infrastructure and health and welfare. This is consistent with two of the main functions of standards, the establishment of technical interoperability and product safety. On the other hand, the overlap between the perceived relevance and the coverage by standards is somewhat more divergent when it comes to issues such as climate action, or decent work and economic growth. This can certainly also be explained by the different balance between standardization and regulation in these areas (see Indicator Report 2019).

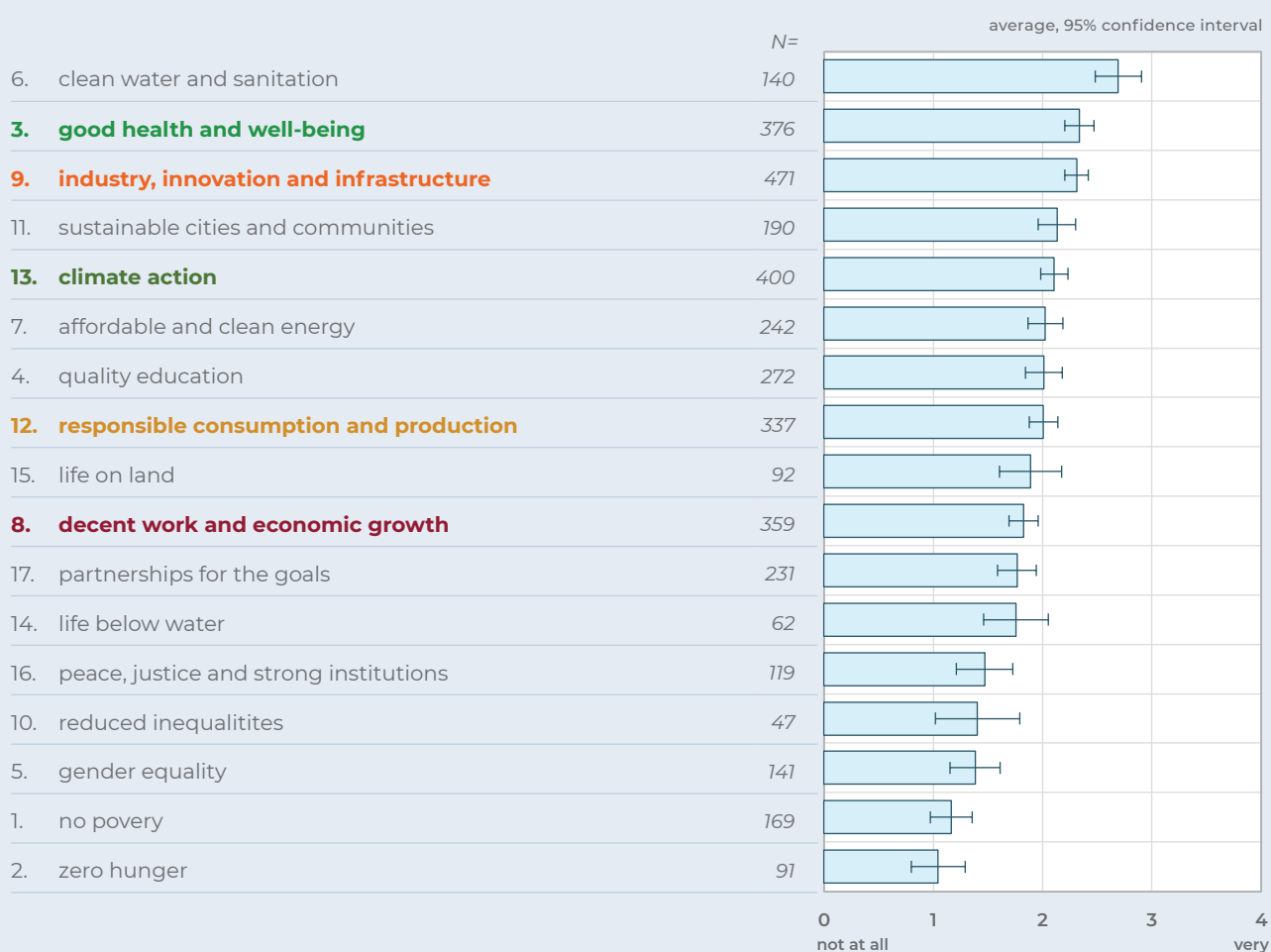
## Formal standards: positive influence on achieving SDGs

To what extent do standards support companies in achieving sustainability goals? The participants rated this for each of the 17 goals on a scale from 0 ("not at all") to 4 ("very", Figure 10). Results show that standards were perceived to support the achievement of those goals more strongly that were rated as more relevant by

the participants. A connection between standards and SDGs was primarily made in cases where technology plays a central role. The goal of provisioning "clean water and sanitation", for example, was perceived to receive the broadest support by standards, whereas standards played a smaller role in the realization of societal goals such as "zero hunger", "no poverty" and "gender equality".

Figure 10

To what extent do standards support your company or industry in achieving these SDGs?



Assessments varied when taking into account different types of standards. The most positive influence on achieving the sustainable development goals was associated with formal standards (Figure 11). On average, the greatest influence was seen by harmonized European standards, followed by international standards. Overall, standards that are referred to by laws or directives at national or European level were perceived to have a higher influence. This is in line with results from the previous year's survey (Indicator Report 2019), which showed that compliance with standards that are referred to by laws is particularly important and that compliance with harmonized standards is even de-facto mandatory for many companies. Rules that promote the realization of sustainable development goals are thus particularly effective when defined in harmonized standards.

Participants from different industries consistently rated the influence of formal standards at national and international levels as positive for the achievement of sustainability goals. Technical rules and specifications were evaluated neutrally to positively by all industries. In contrast to that, de-facto standards were perceived to have a negative impact by companies active in the mechanical engineering, electrical engineering, metal production and consumer goods industries. Participants who offered freelance and scientific services, or were active in certification or testing, tended to have a critical attitude towards company standards. Consortia standards

**Figure 11**

### Influence of standards on the achievement of sustainable development goals

In your opinion, which types of standards have the greatest overall impact on the achievement of these [selected in ranking] SDGs?

*N≥869; average influence, 95% confidence intervals.*



received most rejection regarding their influence on sustainability goals in electrical engineering, metal production, as well as in professional and scientific services and in certification and testing. All other industries were rather neutral in their respective ratings.

### Standardization can increase support for SDGs

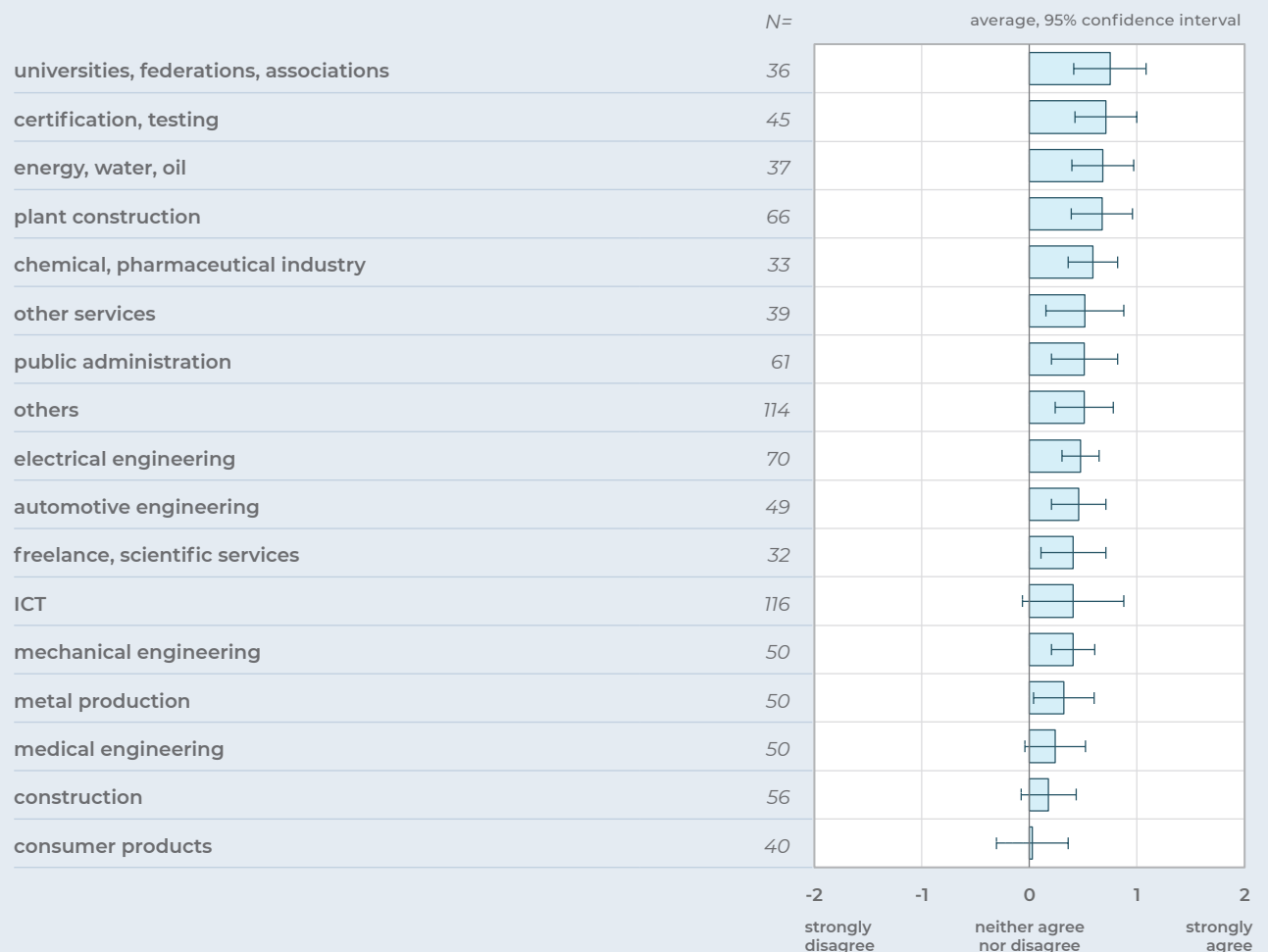
Participants were further asked whether standardization can provide even stronger support for the achievement of sustainability goals. On average, they "partly" agreed to this statement or said it was "rather true". While above all potential for stronger support was seen by universities, associations and federations as well as certification and testing companies saw, the construction industry and manufacturers of consumer goods were neutral in their views. Particularly participants who had prioritized the objectives "life below water", "climate action" and "good health and well-being", expressed a desire for stronger support by standardization.

A total of 194 participants answered the open question on how standardization could increase its contribution to achieving the sustainability goals. The diverse and in some cases rather comprehensive answers showed that the topic raised interest and was accepted by companies.

Most responses (52 %) targeted the design of standards and the standardization process. Participants particularly suggested more explicit references to sustainability goals, for example by clearly naming relevant goals in the introductory texts of standards, and by concisely defining concrete, measurable requirements related to sustainability. Frequently named aspects in this context were “extended product lifetimes”, “resource conservation” and “recycling”. A more diverse participation in the standardization process, for example through a better representation of non-industrial interest groups, was seen to potentially improve the consideration of such objectives. Particularly in the development of international standards, a better involvement of emerging and developing countries was demanded. Some participants pointed out that standardization needs faster processes in order to keep pace with changing societal objectives. A further focal point was the perceived necessity of representing SDGs more strongly at the strategic level, in order to establish links between separate areas of standardization and thus be able to pursue overarching objectives more effectively.

**Figure 12**

**Can standardization support the achievement of the SDGs even more?**



A smaller group of participants (24%) argued similarly, for whom more international harmonization in particular was a key to more sustainable standards. In their opinion, regional objectives should be better coordinated and inconsistent regulations removed. Countries that put a smaller focus on sustainability should be encouraged to do so by means of international standards. An equally large proportion (24 %) saw potential for improvement in the application of standards. Some companies called for better monitoring of correct implementation, as well as greater commitment through a closer relationship with legislation, especially in the case of standards that promote sustainability. Particularly respondents from SMEs (21%) mentioned aspects related to better access to standards and easier application. Standardization texts should be kept simpler and, at best, contain concrete implementations and best practices. Furthermore, the diffusion and acceptance of standards should be increased through less cost-intensive participation in the standardization process and better access to standardization texts. In addition, more education about standardization would continue to be needed.

## Summary

The German Standardization Panel examined for the first time the corporate perspective on standards and the sustainable development goals. Results show that standardizing companies see a clear link between standards and SDGs. The achievement of these goals is perceived to be positively influenced by formal standards, especially by harmonized European and international standards. Areas seen as particularly relevant by participants are industry, innovation, infrastructure, health and climate. In their opinion, standardization could further increase its contribution to sustainability. This could be done, e.g., by establishing standardization processes that generate more concrete links between standards and sustainability goals and that better reconcile the outputs of different sub-areas of standardization. Further common suggestions focus on a better implementation of standards and generally more international harmonization.



## THE ROLE OF STANDARDS IN TRADE WITH CHINA AND THE US

A short section in this year's survey re-examined the role of standardization in trade with the US and China after previous analyses in 2013 and 2014. The focus was again on the assessment of export restrictions against the background of various trade barriers, particularly those arising from deviating regional standards and certifications. We further collected preferences for different potential harmonization options, namely the adoption of international standards, the mutual recognition of regional standards, or the multilateral development of specific new standards that would be accepted in all markets linked by a trade agreement.

In 2013, the Panel's special section dealt for the first time in greater detail with trade, standardization, and harmonization. This selection was made against the background of the Transatlantic Trade and Investment Partnership (TTIP) between the European Union and the United States, which was then under negotiation. At that time, an agreement between the EU and the USA was emerging in the TTIP negotiations. The removal of non-tariff trade barriers was the subject of controversial public debate, particularly the question of harmonizing differing standards or recognizing US standards in the EU. In 2014 and 2015, fears of lowering European standards in areas such as environmental and food safety (keywords "chlorine chickens and hormone meat") led to increasing public opposition to the trade agreement<sup>6</sup>.

In contrast, the assessments of the companies participating in the survey of the German Standardization Panel at the end of 2013 underlined the relevance of the negative impact of non-tariff barriers on trade and the perceived benefits of potential market harmonizations. Specific certifications for the US market were seen as the most significant barrier to exports to the US, having a more pronounced impact than associated administrative efforts and tariffs. Specific US-standards were rated as the third-most significant barrier after US regulations in second place. The participants considered the mutual adoption of international standards (such as ISO standards) to be a good harmonization option, instead of mutual recognition of US- and EU-standards (only moderate agreement) or the development of standards specifically tailored to the common economic area (weak rejection).

In a similarly designed section in the 2014 survey, the participants assessed the role of standards in trade with China. Results showed that administrative efforts of exporting to China were considered the most significant barrier to trade and exceeded corresponding efforts for the US market. Chinese tariffs were as well perceived to have a more substantial negative impact on exports than the US equivalent. Just as in trade relations with the US, companies rated the adoption of international standards as the best harmonization option between the EU and China. On average, developing specific EU-China standards was much more strongly rejected than the corresponding option for the US. One possible explanation for this difference was the assumption that German companies and European companies, in general, regarded the Chinese standardization system with a certain skepticism. The mutual recognition of Chinese and EU standards was rated slightly positive but less positive

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<sup>6</sup> Bertelsmann Stiftung, 2016: *Einstellungen zum globalen Handel und TTIP in Deutschland und den USA*. [https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/NW\\_Einstellungen\\_globaler\\_Handel\\_und\\_TTIP.pdf](https://www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/NW_Einstellungen_globaler_Handel_und_TTIP.pdf).

than the US equivalent.

## Barriers to trade with the US and China increase compared to 2013 and 2014

As there have been significant changes in international trade policy since the surveys of 2013 and 2014, the German Standardization Panel again asked its participants for their assessment.

We weighted the samples of 2013, 2014, and 2019 (N=1,009) using industry affiliation and company size and created a balanced panel (N=121) to allow for more reliable comparisons between survey waves. Combined, they highlight a change in perception of trade barriers against the background of trade policy measures of the US, China, and the EU. On average, all surveyed trade barriers are in 2019 rated to have stronger impacts on exports to both the US and China than in 2013/2014. Simultaneously, average assessments of barriers to trade with the US and China converge so that all barriers are now equally assessed as medium impediments.

A balanced panel analysis included only those companies that participated in all three survey waves (N=121) and allowed to eliminate sample composition as a factor for changed ratings. The increased impediments were all confirmed to be statistically significant based on this sample. In some cases, the changes were considerable. In trade with the US, participants rate increased tariffs as the greatest additional barrier to exports. Here, the average impairment increases by almost one

Figure 13

### Barriers to trade

Average impediment of exports to US and China caused by different barriers to trade



point on the underlying 5-point scale. Regarding trade with China, especially the assessments of Chinese regulatory measures (+1 greater impairment) and specific Chinese standards (+0.9) change. Certification for the Chinese market, Chinese tariffs, and administrative efforts for accessing the Chinese market are also increasing barriers to trade. Similarly, the administrative burden in trade with the USA is increasing, followed by trade barriers caused by specific US standards. New US regulatory measures cause the smallest increase in barriers to trade. Overall, trade barriers were considered more impeding by those companies that recorded a higher export turnover from trade with the respective countries.

The participants' perception of increasing protectionism is in line with the European Commission's 2019 report on the nature and number of trade and investment barriers<sup>7</sup>. The report diagnoses an increase in the number of barriers, particularly to exports to China and the US. Overall, it considers China to be the country with the highest number of trade barriers. Concerning recent Chinese regulatory measures, the report refers above all to the general context of the "Made in China 2025" strategy and, in particular, to the Chinese Cybersecurity Law, which came into force in 2017. This law particularly affects the import and certification of IT products that have to conform to specific Chinese standards. Just under a third of the barriers currently listed in the European Market Access Database<sup>8</sup> refers to Chinese measures related to specific Chinese standards and associated certifications. While most of these barriers affect the ICT sector, other areas such as medical technology, pharmaceuticals, food, or textiles are also affected.

International standards remain the preferred harmonization option. Compared to the development of specific standards for trade with China or the US, or the mutual recognition of existing regional standards, companies continue to clearly prefer the use of international standards (Figure 14). The positive assessment of this option lies roughly between that of 2013 and 2014 but does not differ significantly. When comparing the individual years, it must also be taken into account that this option was assessed once as an alternative to US standards (2013) and once as one to Chinese standards (2014).

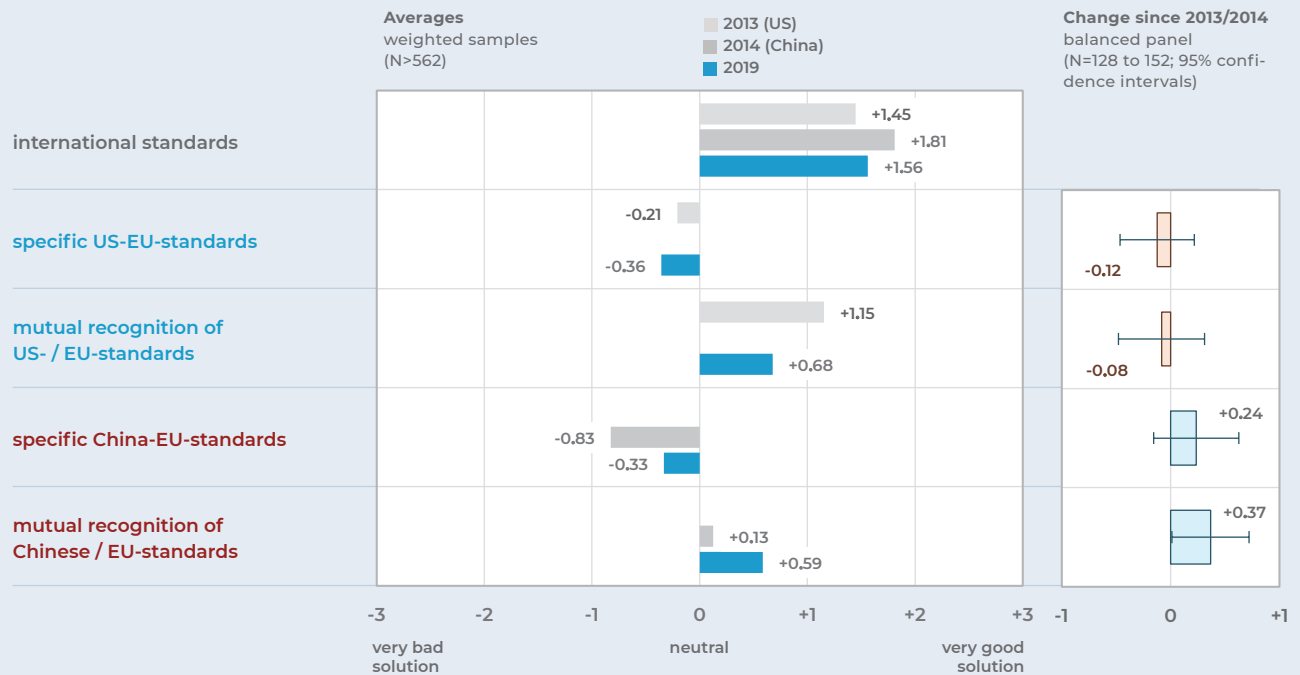
Changes in the assessments of the options of mutual recognition or development of specific standards are, on the other hand, significant. Reservations concerning harmonization options that include Chinese standards have diminished somewhat and are now on a par with corresponding options based on US standards. More companies particularly consider the mutual recognition of Chinese and EU standards a good solution than five years before. This change is also statistically significant in the balanced panel sample. Analogous to the assessment of trade barriers, the options of mutual recognition (China/USA) and international standards were rated significantly better solutions by those companies with more exports to the US or China.

<sup>7</sup> Report from the Commission to the Parliament and the Council on Trade and Investment Barriers, 1 January 2018 - 31 December 2018. 2019. [https://trade.ec.europa.eu/doclib/docs/2019/june/tradoc\\_157929.pdf](https://trade.ec.europa.eu/doclib/docs/2019/june/tradoc_157929.pdf)

<sup>8</sup> [https://madb.europa.eu/madb/barriers\\_result.htm?isSps=false&countries=CN](https://madb.europa.eu/madb/barriers_result.htm?isSps=false&countries=CN)

**Figure 14****Options for harmonization**

Options for harmonization of standards and mutual recognition of certificates

**Summary**

Since 2013 and 2014, barriers to export to China and the USA have increased. In 2013, against the background of the negotiations on the TTIP Agreement, specific US standards and certifications were perceived as the greatest barrier to trade with the US. Five years later, US tariffs are playing an increasingly negative role. In trade with China, administrative efforts remain the biggest problem, while the restricting influence of Chinese regulation and specific Chinese standards and certifications has increased significantly. At the same time, there is now less opposition to the recognition of Chinese standards or the development of specific EU-China standards among German and European companies. The willingness to undertake corresponding bilateral standardization no longer differs significantly from the US level. Overall, the implementation of international standards clearly remains the preferred solution for market harmonization.

## CONCLUSION

### Key findings after the eighth survey of the German Standardization Panel

The results of the 2019 survey of the German Standardization Panel and its connection with preceding waves validate previous findings. They also confirm initial trends and yield new insights into the development of standardization activities over time. Particularly the link to the surveys from 2013 and 2014 generates new findings on the role of standardization in international trade.

Formal standards, technical rules, and specifications developed by formal standardization institutes are by far the most important types of standards for the responding companies. They create legal certainty and facilitate market access for companies. Internal company standards follow in third place and are of particular importance to larger companies in order to increase quality and productivity. They are particularly important for larger companies to increase quality and productivity. External company standards, de-facto standards and informal consortia standards are generally considered to be less important.

In the period from 2013 to 2019, an increasing importance of international standards can be observed. While formal standards at European level do, on average, not gain in importance, they remain the most important standards for the participating companies. All other types of standards, especially consortia and de-facto standards, are becoming increasingly relevant at the European and international level.

The companies were again asked about criteria that influence their decision to participate in formal standardization or consortia. This year's assessments largely confirmed the perceptions from 2018, which stopped the previously observed trend of convergence. Criteria that were perceived as drivers for participation in consortia were especially faster processes and lower document costs. Benefits of participating in formal standardization were, among others, the widespread use of formal standards, and the possibility to exert influence on government regulation.

Certification according to ISO 9001 is the most prevalent among panel participants. The certification of energy management systems according to ISO 50001 has become more important in recent years. Especially in the chemical and pharmaceutical industry, this certification is already widely applied. Certification of IT security management systems is still mostly relevant for large companies and in the ICT and automotive engineering industry.

With this survey, the German Standardization Panel has placed standardization in the context of the UN sustainable development goals and asked for the assessment of relevant companies. Overall, their assessment is congruent with how ISO links international standards to the 17 goals. This is the first time that this assignment has been validated from a corporate perspective. Formal standards, and especially harmonized European and international standards, are considered to have a major positive influence on the achievement of the sustainable development goals. A large proportion of respondents appreciate the support that is offered by standards

in pursuing the sustainability goals, particularly in the areas of innovation, health and climate protection. However, this support can be expanded. Comments in this regard mainly suggest to more concretely refer to SDGs in standards and to further harmonize and internationalize the standards landscape.

Comparisons of the assessments of trade barriers with the USA and China with the results from 2013 and 2014 confirm detrimental developments in recent years and underline the importance of standards in international trade. This also highlights the Panel's high relevance as a regular survey. Only in this manner, trends can be identified and appropriate conclusions drawn for standardization policy and strategy.

The German Standardization Panel is an instrument that can both take up new topics and identify trends through comparison with previous surveys. In autumn 2019, however, the Panel was not yet in a position to assess the implications of the corona pandemic for companies active in standardization, or for standardization itself. This topic will certainly play a prominent role in the coming surveys.

## SURVEY DETAILS

The German Standardization Panel is conducted by the Department of Innovation Economics at the Technical University of Berlin (TU Berlin) and is financed and supported by DIN and DKE.

To present representative results for the companies involved in standardization, the results of the survey are being compared to DIN's data on companies active in standardization. In the medium term, data from the innovation surveys commissioned by the German Federal Ministry of Education and Research since the 1990's, and from the survey on the research and development of economic statistics by the "Stifterverband für die Deutsche Wirtschaft" are being used to complete the picture.

For the next surveys, it will be important to motivate previous participants to take part in subsequent survey waves in order to establish a useful panel structure. Finally, other businesses will need to be encouraged to participate in further surveys, in order to gain a wider, more representative data base.

### Catalogue of questions

The goal of the German Standardization Panel is to measure not only the expenses and effort of companies invest in standardization, i.e. the activities in standards organizations, but also their utilization of the results of this work, that is, the application and implementation of standards and specifications. The questionnaire was divided into four sections:

1. Importance of formal and informal standards and specifications
2. Standardization and sustainability goals
3. Standardization in trade with China/USA
4. Formal and informal standardization activities
5. General information

The complete questionnaires of all surveys since 2012 can be downloaded from the DNP website: [normungspanel.de](https://normungspanel.de)



## GLOSSARY

### Formal standardization

In Germany, “formal” national standardization (also called “full consensus standardization”) is defined as the “systematic unification of material and immaterial subjects carried out by all stakeholders working in consensus for the benefit of society as a whole” (see *DIN 820-1:2014-06 Standardization – Part 1: Principles, definition from DIN 820-3:2014-06*). Provisions are laid down with full consensus and are adopted by recognized formal standards institutes (such as DIN German Institute for Standardization and DKE German Commission for Electrical, Electronic & Information Technologies of DIN and VDE). Formal standardization has a high level of legitimacy due to its well-established processes.

In addition, the international and European standards organizations form a network of national standards institutes. DIN’s staff administer international and European standardization activities carried out in Germany, ensuring that all rules of procedures and guidelines are complied with. They prepare, carry out and follow up meetings of international and European bodies and of the corresponding German “mirror” committees (see [www.din.de](http://www.din.de)).

### Informal standardization

In Germany, a differentiation is made between “Normung” (“formal”, full consensus standardization) and “Standardisierung” (“informal” standardization that is not based on full consensus). The latter process results in specifications, such as the “DIN SPEC”, or consortia standards, for example. Usually these are developed by a temporary body or standardization consortium. Full consensus and the involvement of all stakeholders are not required.

### National standards organizations

**DIN, the German Institute for Standardization**, is a privately organized provider of services related to standardization and the development of specifications. By agreement with the German Federal Government, DIN is the acknowledged national standards body representing German interests at all levels, including the European and international standards organizations. DIN’s purpose is to encourage, organize, steer and moderate standardization and specification activities in systematic and transparent procedures for the benefit of society as a whole and while safeguarding the public interest. DIN publishes its work results and encourages their implementation. Some 30,000 experts contribute their skills and experience to the standardization process, which is coordinated by 400 DIN employees (for further information see [www.din.de](http://www.din.de)).

The **DKE German Commission for Electrical, Electronic & Information Technologies** of DIN and VDE is a modern, non-profit service organization which ensures that electricity is generated, distributed and used in a safe and rational manner, thereby serving the good of the community at large. DKE is the German national organization responsible for developing standards and safety specifications in electrical engineering, electronics and information technology. Its work results form an integral part of the collection of German standards. VDE specifications also form the VDE Specifications Code of safety standards (see [www.dke.de](http://www.dke.de)).

### European standards organizations









In Europe, standards are drawn up by the three officially acknowledged European standards organizations: the European Committee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC) and the European Telecommunications Standards Institute (ETSI). The national standards bodies of CEN and CENELEC's 33 members work together to draw up European standards, which are adopted by the members at the national level (see <http://www.cenelec.eu/aboutus/Pages/default.aspx>).

Each country is represented within CEN and CENELEC by one member body. German interests are represented by DIN within CEN and by the DKE at CENELEC. Each DIN standards committee decides on active participation at the European level. This work is supported by a working committee designated as the "mirror committee" to the relevant European body. This committee determines the German position on a particular subject and sends delegates to the European committees to represent this position and participate in the consensus-building process.

ETSI is responsible for drawing up globally applied standards for the information and communications technology (ICT) industry. This includes television and radio technologies as well as the internet and telecommunications. The European Union has officially recognized ETSI as a European standards organization (see [www.etsi.org/about](http://www.etsi.org/about)).

Figure A.1

Structure of international standardization (Source: [www.din.de](http://www.din.de))

	National level Example Deutschland	Regional level Example Europa	International
General			
Electrical Engineering			
Telecommunications			

### International standards organizations

ISO International Organization for Standardization and IEC International Electrotechnical Commission are private organizations whose members are the national standards organizations. The secretariats of ISO and IEC technical com-

mittees are held by these member organizations, who come from all over the world. DIN's standards committees decide on active participation at the international level and on the adoption of an international standard as a national standard. The main bodies of ISO and IEC are the respective general assemblies; other bodies include policy-making bodies such as the council and technical executive committees, such as the Technical Management Board. Standards work is carried out by national delegations and their experts acting in technical committees, sub-committees and working groups.

Another international body that sets rules is the **ITU International Telecommunication Union**. The ITU is a subsidiary organization of the United Nations, and is based in Geneva, Switzerland. Recommendations of the ITU are developed by government representatives of the 191 member countries and representatives of companies and regional and national organizations. They serve as guideline for legislators and companies in the member countries.

### Formal standards

In Germany, formal standards are developed by the standards committees in DIN and DKE with the full consensus of all stakeholders, and are largely recommendatory in nature. However, if they are cited in a law or contract, their use may become mandatory. They "provide, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at achieving the optimum degree of order in a given context" (definition as in *DIN EN 45020:2006 Standardization and related activities – General vocabulary (ISO/IEC Guide 2:2004)*). Standards define the state of the art at the time of their publication, and contain recommended properties, test methods, safety requirements or dimensions, for example (see [www.din.de](http://www.din.de)).

#### The most important designations for standards:

- **DIN** – National German Standard
- **DIN VDE** – National electrotechnical German Standards containing safety-relevant or EMV-specific provisions
- **DIN ISO, DIN IEC, DIN ISO/IEC** – German translation of an International Standard published by ISO and/or IEC and adopted, unchanged (but sometimes with national elements such as National foreword or National footnote), as a German standard
- **DIN EN** – Official German version of a European standard. All European standards are to be adopted, unchanged, by the members of the European standards organizations CEN/CENELEC/ETSI
- **DIN EN ISO** – Official German version of a European standard which is the unchanged adoption of an International Standard

### Specification (e.g. DIN SPEC)

In Germany, a "specification" such as the "DIN SPEC" is the result of an "informal" standardization process, and describes products, systems or services by defining characteristics and laying down requirements. Like standards, such specifications are developed by experts in formal standards organizations such as DIN. However, they differ from formal standards in that full consensus and the involvement of all stakeholders are not required.

<b>Consortia standards</b>	Like specifications, consortia standards are drawn up in an “informal” standardization process. They are developed on the basis of majority decision by a selected group of companies and organizations taking the form of a “consortium”.
<b>De-facto standards</b>	De-facto standards are not developed by specific consortium, but are a consequence of market demand. De-facto standards are also known as “industry standards” and are developed in what is called an “informal” standardization process. All standards drawn up by industrial interest groups are de-facto standards.
<b>Technical rules</b>	Technical associations actively participate in DIN’s standards committees in order to represent the interests of their members at the national, European and international level. Some of these associations also draw up their own technical rules (see <a href="http://www.din.de">www.din.de</a> ), which contain recommendations on how to comply with legislation, a regulation or an established technical procedure. Although they are not legal documents in themselves, they can become legally binding where cited in a law or regulation, for example in building regulations. Technical rules published by organizations such as VDI, VDMA, VDE are not drawn up with full consensus.
<b>Company standards</b>	Company standards are developed and adopted by companies themselves and or by cooperating businesses (e.g. suppliers). For example, their use can be mandatory for a company’s suppliers.
<b>Panel survey</b>	A panel survey is a survey carried out among the same economic players (persons or companies) on the same topic and over time.



## Contact

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