bitkom

China Standardisation Policy – Recommendations, Settings and Analysis

Position Paper

Content

1. Introduction

Standardisation is used worldwide to ensure compatibility between products and systems of various suppliers. This secures a global base for easy exchange and use. National, regional or sector standards will not, in most cases, allow the integration or use of components, products and systems that are interchangeable between different companies. To realize the full potential of standards and corresponding components, products and systems to be openly accessible, interoperable standards are useful. Setting standards strengthens companies' own capabilities and usually creates a market advantage. German and European industry has noticed an increase in national standards in China, e. g. standards related to semiconductors, 5G or wireless telecommunication standards. One issue here is that in some cases non-Chinese companies have limited or no access to these national standards committees.

Bitkom's AK (»Arbeitskreis« = Working Group) Standardisation aims to be the competent contact for standardisation in Germany for the government, e. g. the German Federal Ministry of Economics and Climate Protection (Bundesministerium für Wirtschaft und Klimaschutz, BMWK). The Bitkom »AK Standardisation« offers to exchange information about the status and effects as well as to discuss the further course of action in the Chinese standardisation policy.

2. Executive Summary

China's gross domestic product (GDP)reached a new record level of around 14.87 trillion US dollars in 2020. For 2021, China's GDP forecast is at around 16.86 trillion US dollars. In 10 years, China will probably replace the USA as the largest trading power. The Chinese government is the main driving force behind this growth. One factor here is standardisation, which is primarily determined by the government in addition to the market economy. Especially the government plays an important role in controlling and has a high influence on technical standards. The Chinese government has recognized the great importance of standards, mainly at international level, and has defined appropriate measures for its standardisation system through the »China Standardisation 2035« program. The main focus here is on participation and assumption of the leadership of relevant standardisation bodies. Although China has reformed its standardisation system, its overall approach remains state-centric. This contributes to the politicization of an area that was traditionally largely technical and private sector driven.

Standards are seen as a common language for driving technology interoperability. However, the Chinese government often relies on strategic enforcement of its standards rather than consensus. This approach carries the risk of a dichotomy, fragmentation and decoupling of standards at the international level.

For European companies, this can result in significant competitive disadvantages. A decoupling of standards at the international level must be prevented.

In the following, the differences and effects of Chinese standardisation policy are therefore highlighted and recommendations for action are made.

3. Recommendations

Standardisation policy should be an instrument for ensuring technical conformity and, as far as possible, uniform interfaces for interoperability and supply chains in different countries and regions. In addition, they have a direct impact on the design of future technologies, royalties, and economic market position. In the future, the influence of standards on policy and society is also likely to grow significantly. Standards contribute furthermore to sustainability and climate engineering efficiency.

The development of national standards that are not reflected at the international level will be a significant competitive disadvantage in the future. Signs of such nationalization of standards can already be observed. A German standardisation strategy, embedded in a European strategy, should promote close cooperation between German research institutes, universities, national standardisation bodies such as DIN, DKE and industry. This will increase the reach, influence and contribution of German stakeholders to standards defined by European (ESOs) or international standards organizations (SDOs).

Recommendation 1: International, multilateral standardisation must remain the preferred route and be supported politically. To this end, a federal government »coordinator« should be established in the German Federal Ministry of Economics and Climate Protection, BMWK. The coordinator should be responsible for developing an interdepartmental strategy and its implementation together with industry. In addition, the BMWK should create awareness of the importance of standardisation for the German economy in the other relevant ministries in Germany. The coordination of standardisation activities with China through the »German-Chinese Commission for Standardisation« (DCKN) will be a key topic in this context.

Recommendation 2: The German government and related state parliaments should develop and foster the education on standardisation. The goal is to reach a certain level of experts in these standardisation bodies. It should at least include:

- increase administration (cross-ministerial) awareness and participation in certain key industry sectors
- improve the know-how on expert level as well as in leadership roles in international and European standardisation organizations (SDOs and ESOs)
- create university courses on standardisation and achieve »easy use« of the latest available standards

Recommendation 3: The German government and the European Commission should coordinate with their Chinese counterparts to implement the proposal from the »China Standards 2035« program that all standardisation activities in China, regardless of the organization in which they take place, must have open, fair and accessible conditions for German or European companies. In bilateral dialogues, it is always important to insist on reciprocity and strive for concrete cooperation. In this regard, the involvement of the EU's seconded standardisation expert in China (SESEC) should be expanded in order to explain and represent the European approach to technical standardisation in China in coordination with the Standardisation Administration of China (SAC).

Recommendation 4: The EU Commission and EU member states, together with industry representatives, should meet annually for a dialog on technical standardisation to identify and coordinate strategic goals and concerns from a public sector perspective. This should include a focus on identifying key strategic sectors (including 5G, AI, IoT, quantum technologies, semiconductors and robotics). Here, it is important to incentivize the adoption of international standards in all funding instruments, especially through the new Global Gateway initiative. Furthermore, indications regarding discriminatory Chinese standardisation practices should be discussed here, which can then be proactively communicated at the international level by the EU Commission. In the case of gross violations, there must be the possibility of simple sanction mechanisms.

Recommendation 5: To reduce conformity costs and receive harmonized standards and technical solutions at an early stage, it is important for European companies to participate in standardisation activities in China. This is because Chinese standards not only have an impact on the Chinese market, but will also ultimately change or influence international standards through the intensive participation and influence of Chinese experts at ISO/IEC level. Therefore, early participation in the development of standards at the national level in China will help.

4. Political setting

The global trade conflict between China and the USA leaves German and European companies in a quandary. In addition to tariffs and bans on doing business in the opposing trading bloc, companies are increasingly confronted with different technical standards when trade with China and the USA is based on national and regional norms. The result would be separate paths in developing technologies that require different components, solutions, software, etc. for the different regions and markets. As a result, the expense of duplicate or triplicate design, development, production, conformity assessment and certification will lead to a massive increase in costs.

The People's Republic of China (PR China) has recognized the strategic importance of standards to achieve industrial and geopolitical goals. Complementing the »Made in China 2025« (MIC2025) strategy, the country is currently developing the »China Standards 2035« program as a central strategy for norms and standards for future technologies. The aim is to set global standards for new technologies. The focus is on the technologies defined as priorities by the government in the respective five-year plan.

This is achieved, on the one hand, through an increased presence in international committees and, on the other, by pushing forward bilateral and regional standardisation work.

Strengthening the international influence of Chinese standards is an important goal of the Chinese government. To achieve this goal, China is trying to take leading roles in international SDOs, in many cases successfully. Foreign companies, on the other hand, often struggle with non-transparent standardisation procedures or access to standardisation bodies in China.

In addition, China is pushing bilateral and regional standardisation work and cooperation. An example of the bilateral standardisation agreement between the EU and China is the Comprehensive Agreement on Investment (CAI). The content in terms of standardisation is described as »Standard setting, approvals and transparency«. Another example, through regional trade and investment agreements, as well as projects such as the New Silk Road (Belt and Road Initiative, BRI), the Chinese government is attempting to establish the technical and regulatory standards of its own economy on a supra-regional basis. As an example, Chinese standards are being applied to infrastructure projects in BRI countries. The figure 1 shows the expansion and influence that can be expected from the BRI, in the context of Chinese national standards, in these countries. It is expected that based on this dissemination, the influence of the international standards will decrease. This might result in the Chinese industry gaining greater market access.[1]

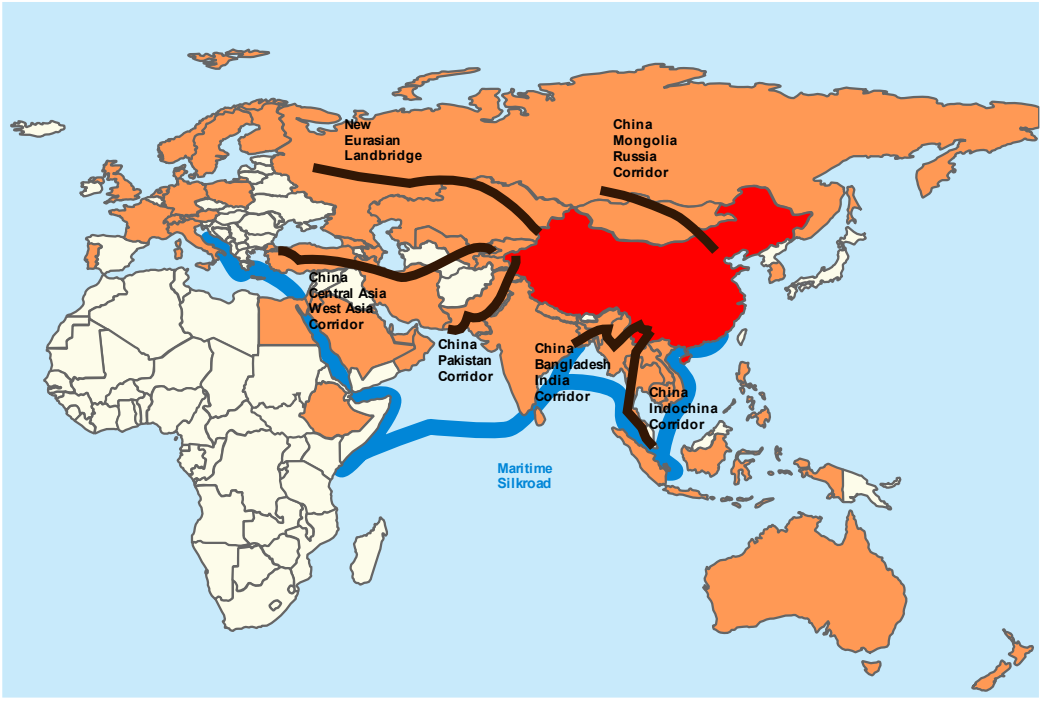

Figure 1 The New Silk Road (Belt and Road Initiative, BRI): China in red, the members of the Asian Infrastructure Investment Bank in orange. The proposed corridors in black (Silk Road by land) and blue (Silk Road by water).[2]

In addition, China plans to establish the »BRI Standards Forum«: a cross-regional organization motivated by trade partnership and trade policy to discuss and set standards. This organization could create new standards for a cross-regional, self-contained group of trading partners that could conflict with existing international standards, creating further competing spheres of standards.[3]

[1]Kim et al.: China Standards 2035 – Poised to Reshape a Multipolar World. Morgan Stanley (2021). Online: https://advisor.morganstanley.com/the-elrod-runyan-group/documents/field/e/el/elrod-%26-runyan-group/Artificial%20Intelligence.pdf [Accessed 7. April 2022]

[2] Wikipedia: Die neue Seidenstraße. Online : https://commons.wikimedia.org/File:One-belt-one-road.svg [Accessed 08. April 2022]

[3] Rühlig, T.: China, Europe and the New Power Competition over Technical Standards (2021). Online: https://www.ui.se/globalassets/ui.se-eng/publications/ui-publications/2021/ui-brief-no.-1-2021.pdf [Accessed 7. April 2022]

5. »China Standards 2035« and the China Standardisation Development Outline

The »China Standards 2035« project is a consulting and scientific project led by the Chinese Academy of Engineering and SAC. It was officially launched in March 2018, immediately after the reform of China's standardisation. The project focuses on China's standardisation strategy until 2035, considering the role, target, implementation ways and policy. It was planned to run for two years. This first phase was to produce a research report and make suggestions for the development of China's standardisation strategy. Several academicians from the Chinese Academy of Engineering and more than 300 experts from various universities, research institutes and other standardisation bodies participated in the project.

The first phase of »China Standards 2035« was completed in January 2020 and the research report was submitted to the State Council. Since then, the second phase of the project is now being implemented. The aim is to develop a national standardisation strategy for China. As a result, the »China National Standardisation Development Outline« was published in October 2021.

Contents of »China Standards 2035«

»China Standards 2035« contains a plan for companies to set global standards for emerging technologies. These include, for example, 5G Internet, the Internet of Things (IoT), and artificial intelligence (AI). It is a nationwide effort to develop industry standards and finally internationalize them. For this reason, there will be close collaboration with other policy programs – especially MIC2025. Key elements of the program include (see Figure 2):

- Indigenous innovations in China's industrial modernization and associated technological self-reliance as a fundamental strategy for national growth
- Strategic industrial sectors as development priorities, e. g. artificial intelligence, quantum technology, semiconductors, neuroscience, genetics and biotechnology, health sciences, and space and earth exploration
- Creating high research and development (R&D) capacity

Other measures include strengthening the innovation capacity of enterprises, improving the technological innovation mechanism and promoting talent.

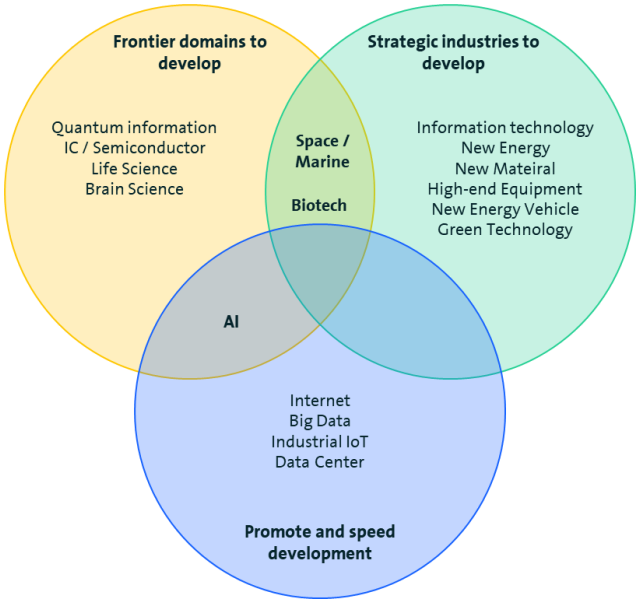

Figure 2 Key factors of »China Standards 2035« [1]

The Chinese strategy and the decided actions also have an impact on European companies. First, the **positive aspects**:

- »China Standard 2035« states: »Ensure the participation of foreign-invested enterprises in the standards development according to laws.« From this, it can be concluded that the participation of European companies in the Chinese standardisation organizations and standardisation processes is generally welcomed.

- In addition, a major part of international standards (up to 85 percent) is to be adopted in China. This would make it much easier for European companies to comply with standards and reduce costs.

- China is striving to establish a system of reference standards for regulation. In this context, it is planned to learn from the experience of the European New Approach and the National legislative framework (NLF). European companies that are familiar with this system will also agree.

In summary, the document is in general friendly to foreign-invested enterprises in terms of standardisation development. Nevertheless, there are also some **challenges and uncertainties** for European companies. These include:

- The average development time for national standards will be reduced to 18 months. Therefore, it will probably be more difficult for European companies to provide adequate feedback on standards in a timely manner, as European companies usually take longer for internal discussion and coordination.

- For association standards in China, European companies in the future competition may have more challenges, including higher costs and risks.

- China promotes market-oriented standards, which may cause deviations from ISO/IEC standards. This needs to be carefully monitored by European companies.

6. International standardiziation in the context of »China Standards 2035«

Strengthening the international influence of Chinese standards is an important aim of the Chinese government. For this reason, China is trying to take leading roles in the international SDOs. An overview of the participation of Chinese representatives in IEC and ISO committees is given below. In addition, access to international and European boards will be compared to Chinese boards. The influence of the Chinese approach on technical standardisation is also of importance in this context.

6.1. China Participation on IEC and ISO Groups

Looking at Chinese participation in international standards-setting, as of April 2021, China had 64 secretariats in the International Standardisation Organization (ISO) and 11 in the International Electrotechnical Commission (IEC). In 2020, China led the development of 121 ISO standards (7.4 percent of the total ISO standards published that year and an increase of two percent over 2019).[4]

To provide further inside, China holds several key positions in technical standardisation organizations:

- International Standardisation Organization (ISO): Council member (since 2008), member in technical Management Board (since 2013), ISO President Zhao Xiaogang (2015-2018)
- International Electrotechnical Commission (IEC): Zhu Yinbiao, President
- International Telecommunication Union (ITU): Zhao Houlin, Secretary General

The institutional leadership positions help China to shape the agenda, but they have relatively little impact on the concrete development of standards. For this process, the secretariats of technical committees (TCs), subcommittees (SCs) and working groups (WGs) are more impactful. Although secretariats are supposed to be neutral [5], technical standardisation experts agree that secretariats exert an enormous influence by structuring, organizing and coordinating the standard-setting process. However, as Figure 3 demonstrates, China is far from dominating international SDOs in terms of technical leadership positions.

[4] Standards and Conformity Assessment Working Group / Forum: Position Paper 2021 / 2022. (2021). Online: https://www.europeanchamber.com.cn/en/publications-archive/949/Standards_and_Conformity_Assessment_Working_Group_Position_Paper_2021_2022 [Accessed 7.April 2022]
[5] International Organization for Standardization: My ISO Job – What What Delegates and Experts Need to Know. (2018). Online: https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/my_iso_job.pdf. [Accessed 8. April 2022]

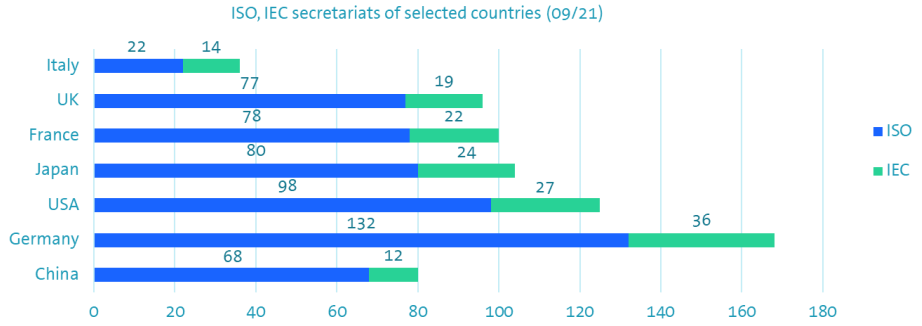

Figure 3 ISO, IEC secretariats of selected countries as of September 2021 (Source ISO/IEC)

However, China's influence is increasing. From 2011 to 2018, China's share in ISO TC and SC secretariats grew from five percent to 8.2 percent. In ISO WG secretariats, China's share grew from two percent to 6.6 per cent (see Figure 4). According to US-China Business Council (CBC) calculations, China increased its share of ISO TC/SC secretariats by 73 percent between 2011 and 2020; and by 67 percent for the same type of positions in the IEC between 2012 and 2020.[6]

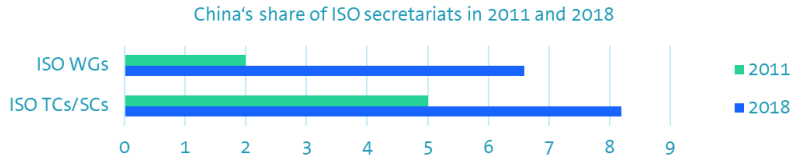

Figure 4 China's share of ISO secretariats in 2011 and 2018 (Source: DIN)

Chinas influence in terms of ISO participation in TCs and SCs increased by 106 percent between 2010 to 2020. Due to this massive increase of Chinese participants the influence on content creation in ISO standards might increase as well. If it will let to an increase of Chinese national standard content into ISO standards needs carefully be monitored. It is very likely due to the mentioned program »China Standards 2035« which has as one of the goals to use China national standards to influence international standards in their favor.[7]

[6] The US-China Business Council: China in International Standards Setting. (2020). Online: https://www.uschina.org/sites/default/files/china_in_international_standards_setting.pdf. [Accessed 6. April 2022]

[7] Fischer, E.; Herwartz, C.: China greift nach der Industrienorm – und deutsche Firmen haben das Nachsehen. (2021). Handelsblatt. Online: https://www.handelsblatt.com/politik/international/zukunft-der-industrie-china-greift-nach-der-industrienorm-und-deutsche-firmen-haben-das-nachsehen/27480404.html [Accessed 6. April 2022]

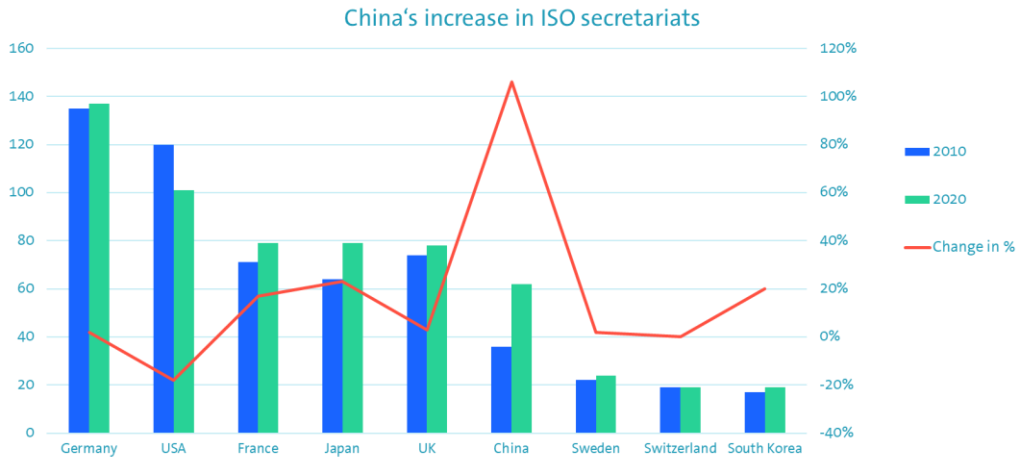

Figure 5 China's increase in ISO secretariats (Source: Infineon Technologies AG)

The potential impact in case of IEC and ISO from China is a higher influence on the standards-setting due to presence in more TCs. Additionally, the increased led of ISO standard development (106 percent growth from 2010 to 2020) will create over time an even bigger influence on the technical content of the new standards. A similar increased participation is expected and partly visible in IEC standards-setting, as well as technical contribution to new standards (e.g. »New Work Item Proposals« in TC 47 Semiconductor devices).

6.2. Differences in access

The German and European Standardisation Organizations (ESOs) such as CEN, CENELEC and ETSI are responsible for harmonized standards in Europe at present. In addition, associations for various industry segments such as 5GAA (automotive), 5G-ACIA (Industry 4.0) develop contributions to global standards, e. g. to 3GPP for the ICT industry. They are market and industry oriented. The European ESOs are open for global companies to join (provided a subsidiary in the respective member state). In the case of CEN and CENELEC, this is managed by the National Committee (NC).

The PR China system, in contrast, consists of five types of standards divided into two levels, a state level and a market level (Figure 5).The state level still consists of national, sectoral and local standards developed under the umbrella of state institutions. National standards can still be mandatory or voluntary. All local standards and the majority of sectoral standards are now voluntary. The new market level includes two types of standards: Association standards are issued by a rapidly growing number of competing industry associations. These associations do not need to obtain a standard license from the SAC – an element modeled on the U.S. approach. Company standards are product specifications developed by individual companies.

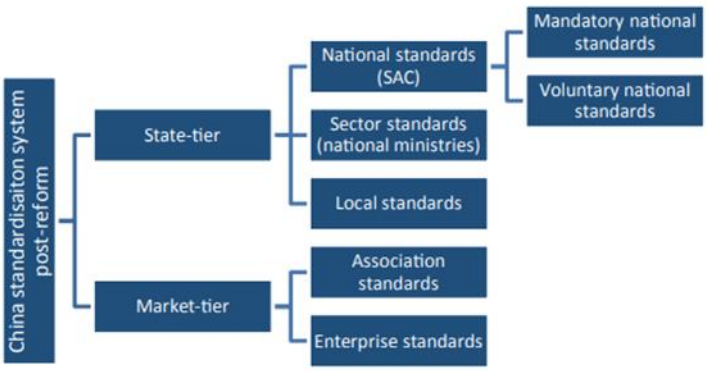

Figure 6 China's two-tier standardisation system post-reform (Source: Infineon Technologies AG)

One problem here is that foreign companies in some cases have only limited access to the Chinese standardisation committees and are sometimes even excluded from them. The Safety Committee is a suitably negative example here: Supporting documents and results of reviews, such as those related to supply chain security risk assessment standards and 5G security standards, are not published. This lack of transparency also affects the work of the Technical Committee on Information Security Standardisation (TC260 WGs) and the development of standards for critical sectors such as telecommunications, aerospace, and biomedical. However, there are also positive examples available now: The strategic approach of the semiconductor industry in China, which is extending its standardisation work, including certification and regulation, to both national and international standardisation, should be mentioned here.

The state-centric focus in China's standardisation reform has additionally resulted in a partial convergence with international and European regulatory initiatives. Although Chinese legislation – above all the Foreign Investment Law (FIL)23 – provides that the relevant stakeholders should have equal access to, and rights of participation in standardisation activities, this has not yet been fully implemented. As the report's examples show, there are still significant barriers to technical standardisation in the PR China. These include: voting rights, exclusion from informal coordination, restrictions on technical guidance, lack of information and transparency, monopolies due to preferential status, high charges, hidden political agenda, and insufficient protection of intellectual property.

For the future, this will above all be an opportunity for collaborative work on relevant standards. The intention of the SAC is to use more and more international standards, and this forms the basis for successful international cooperation. However, this also requires adequate engagement on the part of the German National Committee and the relevant experts from industry. The aim could be, as discussed at the Qingdao Forum 2021, to promote exchange and understanding of each other's international standardisation practices and to facilitate comprehensive cooperation in terms of technology, markets, talents and projects.

6.3. Impact on Technical regulation

Standards and certification are interrelated in several ways in China. Many Chinese certification and regulatory bodies are controlled by or are under the influence of the government. Therefore, they are involved in the approval process, such as OSCCA, SAMR, CCRC and others.

Certification by OSCCA is not a requirement for market entry in China – in this case, referring to bank card products. The certification system is voluntary. However, if a bank in China decides to purchase certified products, it would be classified as market conduct. The certification indirectly becomes a barrier to market entry in China for foreign companies that cannot achieve such OSCCA certification. This is now the case for semiconductor companies outside China.

Future changes are possible in this regard. For example, the plan is to establish a new National IC Semiconductor Technical Committee (NICS TC) in China. In late January 2021, the Chinese Ministry of Industry and Information Technology (MIIT) submitted an application to establish a NICS TC for IC semiconductors. The secretariat will be located at the China Electronics Standardisation Institute (CESI). In this regard, CESI/MIIT stated in December 2021 that foreign companies can apply for membership in the new committee (deadline 12/30/2021). To date, the NICS TC does not have a specific intellectual property rights (IPR) policy and currently applies the general rules issued by the Chinese government for national technical committees. The committee will be responsible for national and sector-specific standards in China and will reflect the work of the four main standards committees involved in IEC TC 47 for semiconductor devices. However, the NICS TC will also have a much broader scope than IEC TC 47.

6.4. Impact on ICT market access conditions

The Chinese government has issued binding market access regulations and mandatory standards for software and hardware used in the telecommunications market and for applications for ICT hardware and devices. Horizontally, there are currently five key access regulations: SRRC certification, NAL/CAT license, China RoHS, China WEEE. Vertical industries have their own requirements for ICT products. Government recommended conformity assessment systems serve as mandatory access requirements in some specific markets.

For ICT services, value-added telecommunications services and related software, on the other hand, mandatory market access regulations have been issued. Figure 7 gives an overview of the mandatory schemes and standards for ICT hardware and software in China.

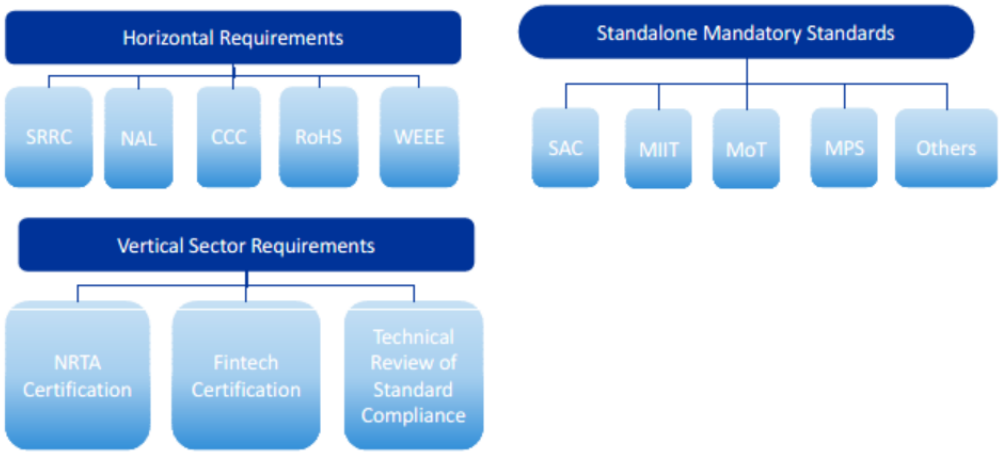

Figure 7 Mandatory schemes and standards for ICT hardware and software (Source: Infineon Technologies AG)

Main findings on requirements from the telecom operators in China (China Mobile, China Unicom, China Telecom) is that warehouse tests and tendering requirements are the actual market access requirements for core network equipment. For the telecom terminal products, it is important to enter the sales channels of the Chinese (state-owned) operator market through the warehouse tests.

Main findings for information security requirements for equipment, systems and services:

- Increasing in network critical equipment and security-specific commercial products encryption certification started
- Foreign entities having difficulties joining relevant Technical Committees (TC), e. g. European semiconductor companies are not allowed to join certain TC260 TCs

In addition, the Chinese government has developed other measures under the cybersecurity regime to erect barriers to the entry of foreign products (companies) into the Chinese ICT market.

In specific, the IoT and intelligence market (manufacturing, transport, smart living, finance and healthcare) is opening up access to new areas for the IT and ICT markets. Here, the market will act as a pioneer. The initiator in this approach is always the Chinese agency CESI, which exerts corresponding influence through its own tests, assessments, and certifications. In the field of chip technology (IC), for example, CESI has set up the MIIT Key Laboratory of Integrated Circuits (IC) Testing and Evaluation. It was established to assist the government (primarily MIIT) in testing standards developed by the government. It is very likely that these standards are Chinese standards and not international standards.

7. Conclusion

China has recently reformed its standardisation system, but the general approach remains state-centered. Due to the country's rapidly growing importance from an economic as well as a standardisation perspective, this has a strong impact on the national industry. Standardisation has always been technically and privately driven in the past in Germany and Europe. Because of the Chinese activities, a strategy with political support is also required here. Appropriate recommendations have been developed for this purpose.

Bitkom represents more than 2,700 companies in the digital economy, including more than 2,000 direct members. These companies generate annual sales of 190 billion euros with IT and telecommunications services - including exports of 50 billion euros. Bitkom members employ more than 2 million people in Germany. Members include more than 1,000 SMEs, over 500 startups and almost all global players. They offer software, IT services, telecommunications or Internet services, manufacture devices and components, are active in the field of digital media or are otherwise part of the digital economy. 80 percent of the companies are headquartered in Germany, 8 percent each come from Europe and the USA, and 4 percent from other regions. Bitkom promotes and drives the digital transformation of the German economy and advocates broad social participation in digital developments. The aim is to make Germany a leading global digital location.

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