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# Technical standardisation, China and the future international order

## A European perspective

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# Preface

*"There is a growing appreciation in Europe that the balance of challenges and opportunities presented by China has shifted. In the last decade, China's economic power and political influence have grown with unprecedented scale and speed, reflecting its ambitions to become a leading global power."* – European Commission, EU-China – A strategic outlook, 2019

Technical standard-setting is – even though often very underrated – one dimension of the EU's strategy to shape globalisation. Until now, a common practice used by the Member States of the EU therefore has been to push forwards the implementation of its own standards internationally through its engagement in, for example, the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). However, in recent years, the People's Republic of China has intensified its attempts to use standardisation for the promotion of its international influence. In this context, the so-called "One Belt, One Road" initiative serve as an instrument to set technical standards outside the international standardisation institutions. While technical standardisation in Europe and the US is mainly driven by private self-regulation with only little influence from states, China's take on it is an essentially state-driven approach with the potential to fundamentally reshape the future order of technical standardisation and to fuel the role of technical standardisation for political competition between "great powers".

Against this background, the Heinrich Böll Foundation European Union commissioned this study by Dr Tim Rühlig. The study analyses two main questions: What are the ongoing processes of politicisation and transformation of international technical standardisation from a European perspective? What are the differences between the European and the Chinese standardisation systems? It concludes with concrete recommendations to European policy makers.

We would like to thank the author for his efforts and highly valuable research. We hope that the findings of this study contribute to the highly relevant discussions around the future of EU-China relations.

Brussels, February 2020

Eva van de Rakt,
*Head of Office, Heinrich-Böll-Stiftung European Union*

Anna Schwarz,
*Head of Global Transformation Programme, Heinrich-Böll-Stiftung European Union*

# Political Comment

Standardisation policy hardly ever strikes the eye of a wider public. The hugely beneficial work that international standardisation organisations are doing, has thus been often underestimated in its strategic value. It is a fact however that Europe has for quite some time been boxing well above its weight in the promotion of good regionally and globally agreed standards.

The world of standardisation is undergoing relevant changes as economic balances of power shift. China, for one, has clearly begun stretching its muscles, particularly in the context of its Belt and Road Initiative. For Europe, to continue being an effective player regarding global standardisation, there is a need to reconsider our priorities, to create more awareness, and to come up with ways of promoting our interests and values in this sector more efficiently. Standardisation will in the future play an even bigger role for sustaining and developing European competitiveness. And for combining competitiveness with sustainability.

In another context, ETSI, one of the European standardisation bodies, brought together people from different backgrounds in order to produce a study "Calling the Shots – Standardization for EU Competitiveness in a Digital Era" in 2019, aimed at invigorating such a conversation. The German standardisation body DIN (Deutsches Institut für Normung) has also been very active on these issues. It is all the more welcome that the Boell Foundation now joins the discussion with this study "Technical standardisation, China and the future international order. A European perspective", which does make an important contribution to a highly necessary exchange between industry, regulators and legislators over a successful European standardisation policy for the future. It is valuable in many ways, most notably by putting highly technical standardisation issues into the pertinent geo-economic and geo-political context. The recommendations to European policy-makers should be well heeded.

Brussels, February 2020

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# Executive Summary

For decades and almost unnoticed by the general public and politicians, technical standards have been a driving engine behind globalisation. In recent years, they run the risk of turning into a core subject of great power competition over high technology. China's growing footprint in international technical standardisation is not the only development fuelling this phenomenon, but it is one of the most crucial. While technical standardisation was mainly a matter of private self-regulation with only a marginal role for states, China takes an essentially state-driven approach with the potential to fundamentally reshape the future order of technical standardisation. In addition, China has incorporated a standardisation dimension into its Belt and Road Initiative. This could contribute to a trend that weakens the existing international technical standardisation institutions.

In this context, Europe is facing at least four challenges: firstly, Europe increasingly finds itself squeezed in between the growing US-China technological power rivalry. This includes the EU's traditional stronghold of technical standardisation. While Europe has profited from technical standards facilitating the globalisation of trade and production, it may suffer if standards turn into a matter of power rivalry. The EU needs to make sure it does not fall victim to this tendency.

Secondly, Europe emphasises its commitment to rules-based institutions in world affairs. Hence, it cannot simply adopt the new power approach to technical standards, since this undermines the existing institutional framework of international technical standardisation.

Thirdly, the empowerment of a state-directed approach undermines Europe's basic aspiration to encourage the democratic ideal of societal self-governance. Instead, it contributes to a re-strengthening of state sovereignty and state control.

Fourthly, Europe's "Standard Power" is declining. From a perspective that purely aims to preserve European influence, the EU needs to consider what it can do to meet this development and remain a bastion of international technical standardisation.

All these developments are clearly not only the result of China's policies. Rising contestation over high technology politicises technical standardisation, which makes us aware of how politically relevant technical standardisation has always been. Hence, the changing role and perception of technical standardisation is not entirely negative. Most encouragingly, China is still undergoing a major standardisation reform. This might provide a window of opportunity for Europe to influence the future of China's approach to technical standardisation and preserve the existing international technical standardisation order. Accordingly, this paper ends with concrete policy recommendations for the European Union.

# 1. Introduction

*The time when we [in China] naively believed in globalisation is over. The government is more and more interested in geo-economics. […] For long, we have only adapted to technical standards but now we are more confident and spread our own Chinese standards. This is very important for our companies and our competitiveness to stay at the top in the new "geopolitical era". […] The central government rightly believes that standardisation is one of the most important factors for the economic future of China and our standing in the world.*[1]

Geo-economic rivalry is back on the agenda – not only in China, but in the West as well. One of the most important dimensions of this development is the competition over high technology. Within this field and largely overlooked, technical standards risk turning into a major battlefield. China's footprint in technical standardisation is constantly growing. The People's Republic of China (PRC), in turn, could rewrite the global technical standardisation order as we know it: The existing international technical standardisation order is essentially about private self-regulation. In essence it is a transparent, inclusive and efficient mechanism to generate interoperability of technology for the purpose of facilitating international trade and globalisation. China, in turn, follows a rather state-directed approach to technical standardisation, which runs the risk of transforming standardisation into a field of strategic state policies, and power politics. Particularly the standardisation dimension of China's Belt and Road Initiative (BRI) could not only help undermine the existing rules-based institutional framework but fuel a geopolitical turn to technical standardisation. Apart from the risk that technical standardisation changes from an enabler of globalisation into a field of geopolitical competition and the imminent danger that existing institutions are being undermined, a strengthening of the role of states at the cost of private self-regulation is yet another blow to any aspiration that encourages societal self-coordination and cooperation. All this indicates a decline of European influence in global technical standardisation, a field where actors from within the EU have been remarkably strong for decades. For Europe, it is time to act.

## 1.1. From globalisation to geo-economics: the role of technical standards

The first two decades after the end of the Cold War were largely shaped by a unipolar moment of US domination coupled with a belief in liberal political and economic values leading some to go as far as assuming it was the "end of history".[2] Underlying the economic angle of it was the argument that rising interdependence in times of globalisation had led to a transformation of the global economic and security order that was hard to, if ever possible, reverse. Optimism was remarkably widespread that interstate wars had become very costly and thus unlikely to (re-) emerge. In economic terms, profits from globalisation were distributed unequally, but the idea was that the overall increase in prosperity around the globe was too obvious to question whether the increasingly interconnected and interwoven economies should decouple again. Hence, connectivity as such was perceived as a *non-political enabler* necessary for economic exchange and thus treated as a *common good*.[3]

In line with the non-political approach to connectivity, the conditions necessary to generate connectivity remained undisputed as well. Most crucial in this regard was to increase the interoperability of products and technology across manufacturers and across national borders. Just consider, for example, how our global communication had developed if we had been unable to call from the cell phone produced by one manufacturer to the cell phone of another supplier? What we take for granted today required that states provided a framework in which corporates agreed on *common technical specifications generating interoperability*. In a sense, these *technical standards* are the basic engine of the globalisation process of the late 20th and early 21st century.[4] However, since connectivity as such was not politicised, so too were technical standards treated, as non-political enablers for cross-border flows of goods, services and data without receiving much political or public attention.[5] This is rapidly changing with an ongoing process of politicisation of technical standards. This is neither to say that the politicisation of technical standardisation is purely China's "fault" nor that this politicisation is entirely

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**1** Author interview a member of a leading Chinese think tanks, Shanghai, October 2019.

**2** Francis Fukuyama, *The End of History and the Last Man*, New York, Macmillan, 1992.

**3** Robert O. Keohane and Joseph S. Nye, *Power and Interdependence*, New York, Longman, 1977; Volker Rittberger, ed. *Regime Theory and International Relations*, Oxford, Clarendon Press, 1993.

**4** Strikingly, the origin of international standardisation goes back to the first wave of globalisation in the second half of the 19th century. Back then, two approaches to technical standardisation competed: On the one hand, an internationalist policy aimed at the establishment of international technical standardisation organisations in order to facilitate the exchange of goods across borders. As a result, the IEC was founded in the early 20th century. On the other hand, a rather geopolitical take aimed to establish distinct national standards in order to avoid depend-encies and retain crucial differences in areas regarded as essential for national security. Only after World War did the internationalist approach finally prevail. Hence, in historical perspective, the currently see the re-emergence of a geopolitical turn to technical standardisation.

**5** Philipp Genschel and Raymund Werle, «From National Hiearchices to International Standardization: Modal Changes in the Governance of Telecommunications,» *Journal of Public Policy* 13: 3, 1993, pp. 203-225; Craig N. Murphy and JoAnne Yates, *The International Organization for Standardization (ISO). Global Governance Through Voluntary Consensus*, London, Routledge, 2009.

negative. The PRC's economic rise and growing footprint in international technical standardisation has triggered a geopolitical dynamic that has been fuelled by the USA at least as much as it has by China. This brings to light the political character of technical standardisation that has always existed. Technical standardisation has never been non-political; rather its political dimension has been overlooked. Technical standardisation has been a particularly discrete form of exercising political power since its inherent political core remained largely overlooked.

### 1.2. Technical standardisation and the rise of China

The rise of China has brought the unipolar moment of US dominance to an end. This power shift comes with the questioning of liberal convictions underlying globalisation. Although globalisation has never been uncontested and is subject to criticism, states have realised only now that interdependence is not even that, but the fact that some states depend on others more than vice versa could be utilised for political purposes. Connectivity is not perceived as non-political enablers of a common good anymore, but rather states are currently testing out whether and how they can utilise dependencies resulting in "connectivity wars".[6] The most prominent examples are the trade war between the US and the People's Republic of China (PRC) and the decoupling[7] of high technology in both countries. The fight over the role of Chinese tech-giant Huawei's participation in the rollout of the fifth generation (5G) of mobile infrastructure is only the most visible expression of the rising technology confrontation.[8] An important angle of the growing rivalries over technology is the competition over technical standards. In this context, China's BRI has turned into a main tool to spread Chinese influence by means of economic dependencies coupled with the internationalisation of Chinese technical standards outside the existing international institutional frameworks.

The fight over technical standardisation is, however, not only a matter of the distribution of power instead of simply serving as a non-political enabler of connectivity. The rise of China and the PRC's growing footprint in international technical standardisation risk challenging the *liberal underpinnings of globalisation* as such, and thus raise questions about the world's future economic order. In the unipolar moment of liberal globalisation under US leadership, technical standardisation was mostly left to private self-regulation. It followed the logic that the state should only provide a framework and leave as much as possible to market forces, which would find the most efficient solution. Remarkably though, the US approach to technical standardisation emphasising pure market competition proved – by and large – to be less influential than the European approach of a market-driven public private partnership (PPP).[9] China, in turn, radically breaks with both the US and the European approaches that are both industry-driven. The PRC's standardisation system is essentially state-directed, though not entirely state-controlled. In essence, technical standardisation is yet another expression of China's emphasis of the role of the state in world affairs and its right to sovereign control. As such, China's growing footprint in international technical standardisation brings not only a politicisation of the existing processes and institutions, but raises questions about the reshaping of the international order in the field of technical standardisation, the engine of connectivity, interdependence, and globalisation.

### 1.3. Purpose and structure of this paper

This study paper describes the ongoing processes of politicisation and transformation of international technical standardisation through the lens of political order from an explicitly European perspective. It aims to grasp the essential differences between the European and the Chinese standardisation system without ignoring that China's standardisation policy is still in the making and could turn out to be more liberal and industry-driven then it is today. Hence, I do not treat the issue as an already predetermined one, but rather carve out conditions of an unfolding restructuring process of technical standardisation and provide concrete policy recommendations for the political actors of the European Union (EU).

I first explain what a technical standard is and why it is important, as well as discussing how it relates to the concept of (international) order (section II). Next, I describe the European approach to technical standardisation as an industry-driven public private partnership (PPP) and compare it to the even more industry-

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**6** Mark Leonard and Ulrike Esther Franke, eds., *Connectivity Wars. Why Migration, Finance and Trade are the Geo-economic Battlegrounds of the Future*, London, European Council on Foreign Relations, 2016.

**7** Technological "decoupling" describes that two spheres of technology could emerge, one Western-led and another Chinese-led. The idea behind decoupling is breaking with the assumption that technology necessarily is interoperable to facilitate globalisation. Instead, it could lay grounds for geo-economic and geopolitical logics that aim to establish distinct spheres of political and economic influence by means of creating technology dependencies.

**8** Tim Rühlig and Maja Björk, «What to Make of the Huawei Debate? 5G Network Security and Technology Dependency in Europe,» *UI Paper 1/2020*, Stockholm, The Swedish Institute of International Affairs, 2020.

**9** Mattli and Tim Büthe, «Setting International Standards. Technological Rationality or Primacy of Power?,» *World Politics* 56: 1, 2003, pp. 1-42.

driven US model of technical standardisation (section III). In its main part, the study outlines China's essentially state-driven approach to technical standardisation, contrasting it with the European and US models, including the ongoing domestic reform process within the PRC (section IV). This is not without implications for China's international policies, both within existing international technical standardisation bodies but also outside of them, most prominently within the BRI (section V). The study proceeds with a brief summary (section VI). Finally, I provide policy recommendations for European policymakers (section VII).

To this day, the political dimension of technical standardisation in general and China's growing footprint in particular are under-researched subjects. Hence, this study disproportionally refers to the author's own field research and a multitude of anonymous interviews with standardisation experts and officials mostly from China and Europe.

## 2. Ordering the world by means of technical standards

At first glance, it might appear counterintuitive to assume that technical standardisation, a field that has mostly been overlooked by the public and politics, could carry transformative force for the coming economic order. In fact, I do not claim that technical standardisation has determining force, but I do argue that it has enormous and far-reaching implications. To unfold this argument, I first summarise what a technical standard is, how it is developed and why it is so important (section A). I then turn more explicitly to the question why we should think of technical standardisation as a matter of *order* (section B).

### 2.1. Omnipresent and transformative: technical standards

Technical standards are omnipresent product specifications that create interoperability. USB is a standard for cables, connectors and protocols that enables charging and the exchange of data on a wide range of devices regardless of manufacturer. Similarly, Wi-Fi is a family of radio technologies built upon technical standards that allow for wireless local area networking of a wide range of technological equipment. A final example is the standardisation of screws with far-reaching implications ranging from the production of screwdrivers to furniture. In short, technical standards allow products of all kinds to be applicable in a wide range of contexts across countries and manufacturers. Hence, technical standards facilitate and shape the globalisation of production and boost international trade.

By definition, technical standards are neither laws nor legally-binding state regulations. Instead, technical standards are the result of negotiations among private companies and associations. In a word, technical standards are the result of voluntary private self-regulation. However, technical standards are voluntary on paper only; they are enormously powerful in practice and it is difficult to circumvent them by noncompliance. Products that do not comply with a standard can hardly be sold on the world markets because they only work isolated and not in concert with other products. Furthermore, technical standards are frequently referenced in legally binding national regulations. Regulations set requirements and limits, while technical standards define methods of how to comply with these limits.[10] Technical standards can also become subject to international trade law: the World Trade Organisation's (WTO) Dispute Settlement recurs to international technical standards when identifying technical barriers to trade.[11]

Despite the inherent force of technical standards, their ultimate success depends on whether they serve market needs. When technical standards have been developed and adopted, they will only turn out to be relevant if corporates decide to follow their technical specifications. As long as technical standards are not referenced in legally-binding documents and one cannot prove that they are utilised as a technical barrier to trade there is no way to enforce them since they remain voluntary. Even coordinated attempts by states to push specific standards are hardly successful if the technical solutions underlying a standard do not meet market needs and better technical solutions are available to consumers.

Technical standardisation exists at national, European and global levels. Nationally, specialised associations are licensed as standardisation agencies. In Europe, these national standardisation bodies have joined forces in founding the European standardisation organisations, namely the European Committee for Standardisation (CEN) responsible for general standardisation, the European Committee for Electrotech-

**10** Ioannis Zachariadis, *Standards and the Digitalisation of EU Industry. Economic Implications and Policy Developments. European Parliamentary Research Service Briefing*, Brussels, European Parliament, 2019.

**11** The Dispute Settlement Body requires states to provide sufficient explanation if they do not comply with interna-tional technical standards; otherwise they are found guilty of violating the treaty on technical barriers to trade (TBT). For a good overview, see for example: Kommerskollegium, *From Competition to Convergence. TTIP and the Evolution of Global Standards*, Stockholm, Kommerskollegium, 2015.

nical Standardisation (CENELEC) and the European Telecommunications Standards Institute (ETSI) in the telecommunications sector (see below). The global standardisation organisations, the International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC), are formed by the national standardisation bodies from Europe and around the world.

A bit of an exception to this general layout is telecommunications. Apart from national standardisation bodies, European telecommunication companies are members of ETSI, which has founded, along with similar institutions from Japan, the US and South Korea, the Third Generation Partnership Project (3GPP), which was later joint by the telecommunications standardisation bodies of China and India. 3GPP is a global standardisation organisation in telecommunications, but important aspects remain subject to the International Telecommunications Union (ITU) and its World Radiocommunication Conference, a classic intergovernmental organisation.

In all national, European and global standardisation organisations, standards are negotiated in highly specialised technical committees (TCs), their subcommittees (SCs) and working groups (WGs). These bodies are composed of technical experts working for leading companies in their respective fields, representing the national standards agencies of their company's country of origin or a subsidiary's. They meet on a regular basis in standardisation meetings. All TCs, SCs and WGs are coordinated by secretariats, chairs and vice-chairs. Once standards are drafted, they are circulated and amended and finally voted upon by all members of a TC.[12]

## 2.2. The shifting order of international technical standardisation

For a long time, academics and practitioners did not consider technical standardisation as a matter of politics or international political order. Instead, they adopted what I term an "idealised perception" of technical standardisation. According to this idealised perception, technical standardisation is purely providing best technical solutions to common problems resulting from the lack of interoperability.[13] This view departs from the fact that technical standards are developed in TCs, SCs and WGs by technical experts. Accordingly, the language used in these negotiations is highly technical. For example, the origin of a particular proposal is not treated as a valid argument, but negotiators rather point to technical performance assessments and trials in order to demonstrate the superiority of a proposed technology over another to be accepted as a technical standard. This is not to say that there are no quid pro quo transactions, but rather that the overall mode of technical standardisation focuses on technical, not political or commercial, arguments.[14]

Already years ago, critical accounts have pointed out that technical standardisation was yet another field in which globalisation had empowered private companies over public authorities. From such a critical standpoint, technical standardisation was not a subject of competition among states, but was far from being non-political. Globalisation critics rightly pointed out that technical standardisation has always been about private corporations competing over influence and the distribution of enormous revenue.[15]

The reason lies in the fact that many technical standards consist of patented technology. In order to comply with a given standard, manufacturers have to pay royalty fees to competitors holding "standard-essential patents" (SEPs). All companies that have declared patents in the process of technical standardisation indicate with this step that they accept granting access to SEPs they hold under "FRAND" terms ("fair, reasonable, and non-discriminatory"). Even though FRAND is a voluntary agreement, courts in many jurisdictions around the globe enforce FRAND terms. If the FRAND terminology argues as if SEPs were a matter of fairness and openness, the wording hides that the amount of royalty fees paid for SEPs are enormous. For example, Finland's tech giant Nokia earned 1.65 billion Euros in 2017, representing 7% of the company's revenue.[16] Accordingly, a second strand of literature has challenged the "idealised" perception, pointing to the economic stakes and the empowerment of private corporations resulting from technical standardisation.[17]

What both these literatures neglect is the inherent power potential of technical standardisation for states. Only recently, the first think tank studies have

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**12** Feng Tian, «Standard Setting and Institutional Building for International Infrastructure,» *Routledge Handbook of the Belt and Road,* edited by Fang Cai and Peter Nolan, eds., London, Routledge, pp. 341-345, 2019.

**13** Craig N. Murphy and JoAnne Yates, *The International Organization for Standardization (ISO). Global Governance Through Voluntary Consensus*, London, Routledge, 2009.

**14** Author interviews with several European and Chinese standardisation officials and experts, several cities, January-November 2019.

**15** Kristina Tamm Hallström and Magnus Boström, *Transnational Multi-Stakeholder Standardization. Organizing Fragile Non-State Authority,* Cheltenham, Edward Elgar, 2010.

**16** Dan Strumpf, «Where China Dominates in 5G Technology,» *Wall Street Journal,* accessed: 2019-04-13, at: https://outline.com/dVsKLJ

**17** Büthe and Walter Mattli, *The New Global Rulers. The Privatization of Regulation in the World Economy*, Princeton, Princeton University Press, 2011.

appeared arguing that technical standardisation carries (geo)political implications – though providing anecdotal evidence only.[18] At the core of this new turn lies the insight that it is not just commercial companies that can utilise technical standardisation for their purposes, but also states. Most crucially, the PRC has made technical standardisation a core component of its domestic and international industrial development strategy. It invests in its growing footprint in established international standardisation organisations but – more importantly – aims to internationalise domestic technical standards outside of the existing institutional framework (see section V).

The latter is of particular significance because a fragmentation of technical standards effectively creates distinct spheres of technological influence. For example, if a railway system is constructed along a specific set of standards, the maintenance and buildout of the railway system has to be done by companies that produce along these standards. As long as the set of standards is of global scope, all companies complying with global standards are potential future suppliers. If the applied set of standards is only used by Chinese, European or US manufacturers respectively, any future maintenance or further buildout can only be done by the respective manufacturer. Given that a functioning railway system is critical infrastructure, such economic dependency can easily translate into political dependency contributing to the constitution of geographical corridors of dependency, i.e. a geopolitical logic.

This is not to say that China is the only country that utilises the fragmentation of technical standards for its own purposes. Examples of national European industries being reluctant to establish global standards exist, too.[19] Accordingly, it is important who develops standards, how and in which institutional formats. (See **figure 1**)

While Europe and China do not diverge in all regards on technical standardisation development, one major difference persists: the role of the state (see sections III and IV). Hence, technical standardisation is about more than just the distribution of power across companies and states, but also carries an underlying normative question. It is this divergence that lies at the heart of this study, aiming to describe a potential shift of the existing *international order of technical standardisation*.

When I speak of order, I largely follow James March and Johan Olsen's concept of order as organised around "well-defined boundaries, common rules and practices, shared causal and normative understandings, and resources adequate for collective action".[20] Hence, I treat order mainly as a semi-stable agreement of relevant actors over norms, rules, and institutions that regulate international behaviour. This is not to claim that one overarching unitary order exists. Instead, social orders emanate from the social interaction of actors that differ over areas and fields of international politics and might not even be the product of intentionality.[21] Alastair Ian Johnston has convincingly argued that, in its rise, China rather faces a plurality of international orders that it relates to in different manners instead of complying or not complying with a singular existing liberal world order.[22]

In this study, I treat international technical standardisation as one such international order aiming to trace how European and Chinese practices might shape its future trajectory, carving out the differences in approaches.

**Figure 1: Changing approaches to technical standardisation over time**


Source: own graphic.

18 Jonathan E. Hillman, *Influence and Infrastructure. The Strategic Stakes of Foreign Projects,* Washington D.C., CSIS, 2019; Paul J. Kohlenberg and Nadine Godehardt, "Chinas globale Konnektivitätspolitik," SWP-Aktuell 18, Berlin, SWP, 2018; Kristin Shi-Kupfer and Maraike Ohlberg, «China's Digital Rise. Challenges for Europe,» *Merics Papers on China 7*, Berlin, Merics, 2019; Björn Fägersten and Tim Rühlig, "China's Standard Power and its Geopolitical Implications for Europe," *UI Brief 2/2019*, Stockholm, UI, 2019.

19 Author interviews Europeans standardisation experts and officials, several cities, March-October 2019.

20 James G. March and Johan P. Olson, "The Institutional Dynamics of International Political Orders," *International Organization* 52: 4, 1998, pp. 943-969.

21 Ted Hopf, "The Logic of Habit in International Relations," *European Journal of International Relations* 16: 4, 2010, pp. 539-561; Randall L. Schweller, "The Problem of International Order Revisited. A Review Essay," *International Security* 26: 1, 2001, pp. 161-186.

22 Alastair Iain Johnston, "China in a World of Orders," ibid.44: 2, 2019, pp. 9-60.

## 3. Globalisation through public private partnership: the European approach to technical standardisation

The international standardisation system is largely shaped by the European approach to it and – to a lesser degree – the US. Both systems are different in important aspects, but share that they empower industry instead of public regulation.

### 3.1. The European approach to technical standardisation

To start with, the European system of technical standardisation is a public private partnership (PPP) that is industry-driven but with a comparatively strong regulatory framework. The European system should further be summarised as being a "harmonised" approach. The European harmonised technical standardisation system has at least three characteristics:

First, technical standards are developed by private standardisation bodies. The state is involved only insofar as it issues that license required for developing technical standards. In Europe, only one agency in a particular economic sector and any given country is licensed to develop technical standards. In Germany, for example, the "Deutsches Institut für Normung" (DIN) is the general technical standardisation body; the "Deutsche Kommission Elektrotechnik" (DKE) is the sole technical standardisation agency in the field of electrotechnics.

Second, technical standardisation is hierarchically structured in Europe. If a technical standardisation issued nationally contradicts a technical standard that is developed on European levels, the respective national standard is automatically invalidated. In two agreements, the European standardisation bodies, CEN and CENELEC, have further codified their close coordination with the international standardisation bodies ISO and IEC. According to the "Frankfurt Agreement", CENELEC approaches IEC first when it wants to develop new standards. Only if IEC does not develop the requested standard that serves the European needs, CENELEC initiates the development of a distinct European standard. Accordingly, a high degree (72%) of CENELEC standards are identical to IEC standards and another 6% are based on IEC standards. CEN, in turn, has concluded the "Vienna Agreement" with ISO that is, however, less comprehensive and has led to 33% of all CEN standards being identical to ISO standards. ETSI, finally, is a one of only seven organisational partners of its global equivalent, 3GP, and is thereby closely interwoven with global standardisation as well.

Third, technical standardisation in Europe is not just a matter of private industry, but one of public private partnership (PPP). This implies that technical standards can support regulations issued by the EU Member States and the European Commission (EC). Technical standards can be referenced in regulation as a method to implement requirements under the respective regulation, carrying the presumption of conformity. Moreover, the EC can request the development of technical standards when it sees a need for technical specifications in the implementation of its regulations.[23] The development of such technical standards, known as harmonised European Norms (hENs), is not compulsory. In developing hENs supporting legislation, all three European standardisation organisations (including ETSI) follow the same approach. European standardisation bodies can reject the demands of the EC.

### 3.2. The US and EU systems of technical standardisation in comparison

The US, in contrast, has licensed a high number of competing standardisation organisations in any given economic sector, which has led to a cacophony of US voices in international technical standardisation. In ISO and IEC, the US is represented by the American National Standards Institute (ANSI). ANSI has, however, no authority over other national standardisation bodies. In fact, many US standardisation bodies regard themselves as international if some of their members are international companies.[24] Hence, the US system does not accept ISO and IEC as a priority compared to domestic standardisation organisations.

Comparing the European and US American technical standardisation systems, a number of differences but also one major commonality are apparent: The most crucial difference is that the US has a system of a multitude of competing industry associations issuing technical standards. Which technical standards prevail is purely a matter of the market. This is not to say that in Europe demand does not play a role at all. Technical standards are voluntary, and if the licensed technical standardisation bodies do not develop technical standards that conform to the needs of the market, the likelihood of their practical relevance is low. In such a case, compa-

**23** ETSI, *Calling the Shots. Standardization for EU Competitiveness in a Digital Era,* Sophia Antipolis, ETSI, 2019.
**24** For a good comparison see for example Kommerskollegium, *From Competition to Convergence. TTIP and the Evolution of Global Standards, Stockholm,* Kommerskollegium, 2015..

nies will simply not comply with the voluntary technical standards. It is not least for this reason that Europe has mandated industries with the development of the technical standards that are market players themselves. Another core difference is international technical standardisation bodies do not enjoy any superiority in the US. No hierarchy among technical standards exists.

In a nutshell, the European system is a public private partnership, while the US approach is an entirely private one that leaves the selection of technical standards purely to the market. Given the strong role of industry in the European model, however, it is fair to say that the major commonality of both the US and Europe is that technical standardisation is a *private/industry-driven domain*.

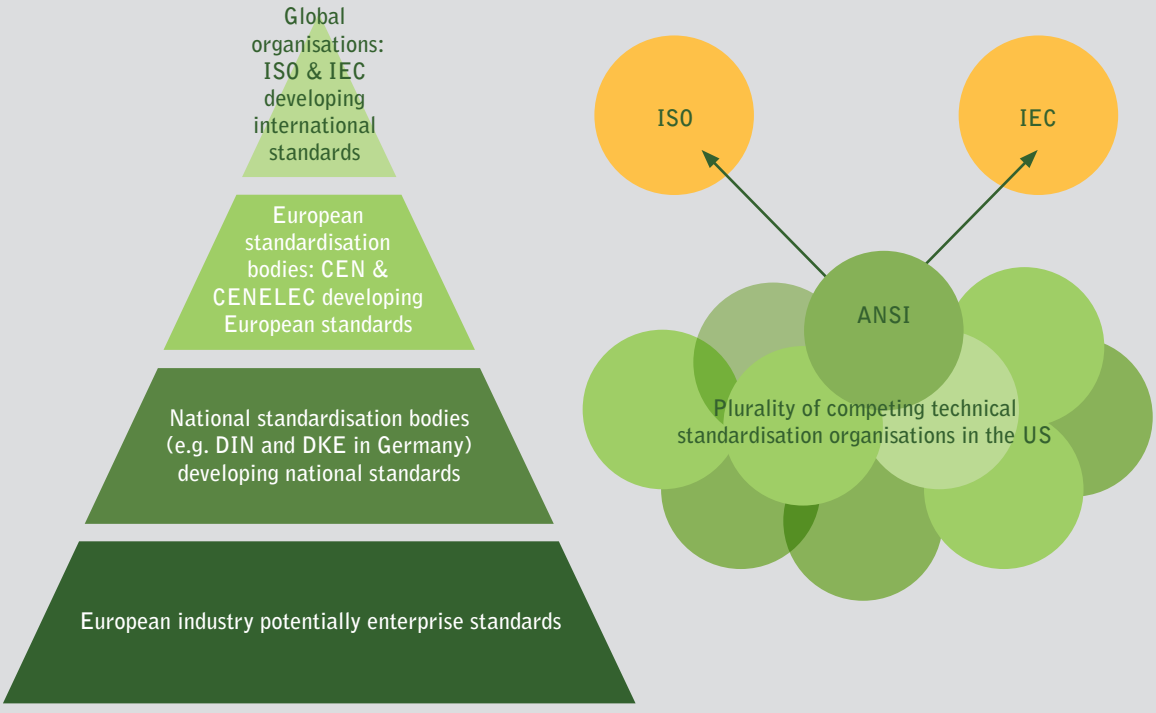
Even though the US remains dominant in technical standardisation for some economic sectors, such as finance, the "harmonised" European system has overall proved to be more effective internationally. Notably, the competitive approach has diminished US influence on international technical standardisation in many economic sectors. In ISO, for example, national standard-setting agencies from EU Member States hold 369 secretariat positions compared to only 104 from the US. In IEC, Europeans hold and advantage of 111 over 26 secretariat positions for the US. (See **figure 2**)

Even in the somewhat different field of telecommunications standardisation, Europe is particularly strong. 3GPP was initiated mainly by ETSI and largely modelled after the structure of the European institute. 3GPP is also headquartered in the same city as ETSI is, i.e. Sophia Antipolis in southern France. A US-led rivalling project, the Third Generation Partnership Project 2 (3GPP2), has failed.

Even though 3GPP works differently from ISO and IEC, all three global standardisation organisations are shaped by enormous European industry influence and largely follow the European model of private self-regulation.

Until recently, European industry was the leading power in international technical standardisation, though it was hardly perceived as such because technical standardisation was seen through the lenses of private self-regulation, not state power.

**Figure 2: European and US standardisation systems in comparison**




Source: own graphic

## 4. What's in for the party-state? China's approach to technical standardisation in the making

In sharp contrast to the European and the US systems of industry-driven technical standardisation, China puts the state at the core of its standardisation efforts. At the same time, however, the Chinese technical standardisation approach is undergoing significant reform and should be considered to be in the making. Even though the previous reform is not fully implemented yet, a push for further reform is visible. These reform proposals strengthen Chinese industry though significant differences that are most likely to remain compared to the European and US models. This raises questions about the future order of technical standardisation. In the following, I first summarise the Chine standardisation system and the reform that is currently implemented (section A). I then turn to further reform efforts that could reshape China's technical standardisation in the next decade (section B).

### 4.1. China's essentially state-driven approach to technical standardisation and the ongoing reform

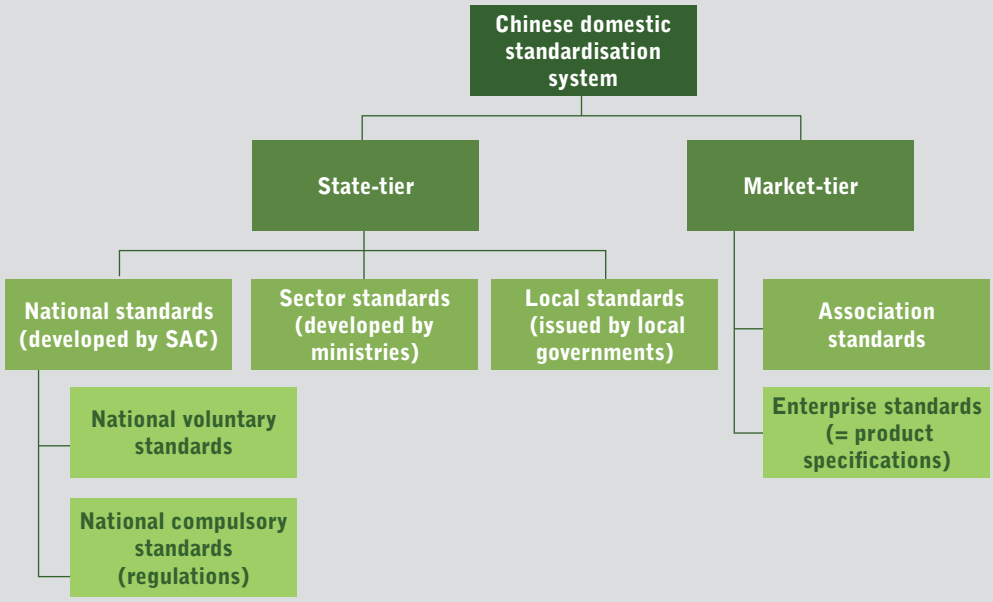
Traditionally, technical standardisation in China was a fully state-led process. Industry was part of the development of standards, but it occurred in state-governed institutions. In recent years, this has somewhat changed. In 2014, the PRC started consultations over a technical standardisation reform that culminated in the adoption of the 2017 revised Standardisation Law. The new law came into force in 2018. The transformation of the Chinese standardisation system is still ongoing, although almost fully implemented at the time of writing this study.

Although the reform has strengthened market-driven standardisation, the Chinese approach remains a dual-system with the ultimate superiority of the state. Technical standards are developed either in a state-driven or a market-driven process.

According to Chinese terminology, China has three types of state-driven standards, namely national standards developed and issued by the Standards Administration of China (SAC); sector standards developed by national ministries; and local standards issued by local governments and only valid in the respective constituency. China further distinguishes between mandatory and voluntary national standards; mandatory national standards, explicitly referred to as standards in Chinese terminology (Guóbiāo or "GB standards" in contrast to Guóbiāo tuījiàn or "GB/T standards" that are national voluntary standards), are not standards in the international sense, but rather legally binding regulations.

The market-driven system includes two types of standards: Association standards are issued by a plurality of private competing associations. These associations do not need to receive a license from the SAC. This single piece of China's standardisation system resembles the US model. Finally, enterprise standards are essentially product specifications of individual firms rather than standards. **Figure 3** provides a general overview of the Chinese technical standardisation system after the 2014-18 reform.

**Figure 3: China's standardisation system after the reform**




Source: own graphic

At first glance, the prevailing Chinese policy seems to combine a state- and a market-driven approach. Against this backdrop, the claim that China's technical standardisation approach is an essentially state-driven one might appear to be far-fetched. China's standardisation system is not equal to the existing, European industry-led system of technical standardisation driven by private companies setting technical standards with mandates set by states, but one might view China's approach simply as yet another form of a PPP. Indeed, China's approach to technical standardisation is pragmatic and not fully state-*controlled*. However, a closer analysis clearly reveals that China has adopted a refurbished *state-centric* approach. The party-state proactively steers technical standardisation. In the following, I further discuss the role and development of all five types of standards (i.e. national standards, sector standards, local standards, association standards, and enterprise standards) and point to the mechanisms of state influence in all of them.

### a. State-tier standardisation: national standards, sector standards and local standards

On the surface, the development of *national standards* looks like technical standardisation in Europe. Both voluntary and compulsory national standards are written by TCs, SCs and WGs whose members are stakeholders from relevant enterprises, research institutions, testing organisations, government, industry associations and customer associations. However, in sharp contrast to the European system, the process is not coordinated by private organisations such as CEN, CENELEC, or DIN. Instead, technical standardisation is carried out under the framework of SAC. SAC consists of two departments of China's State Administration of Market Regulation (SAMR), which holds ministry rank under the State Council of the People's Republic of China. Hence, national standards are not developed in private institutions (like in Europe), but under the umbrella of a state ministry.

National standards address the most fundamental issues including health and security standards. As of 30 September 2019, 36,877 national standards exist, of which more than 2,000 are mandatory.[25]

Since 2014, the number of mandatory national standards has declined dramatically by around 10,000 standards. On paper, the Chinese party-state has given up control by turning compulsory national standards into voluntary ones, leaving it to industry whether to comply or not. However, most voluntary national standards are treated by industry as if they were mandatory.

> *"You have to bear in mind that the state sector in this country is huge. Voluntary national standards give you a sense of what the party expects from us. So, we essentially have to comply if we do not want to upset our main customer. […] This is not specific to us or to [our economic sector] but applies to the whole economy."*[26]

The development of *sector standards* is similar to the process of national standardisation. Relevant industry forms TCs, SCs and expert groups; guidance falls not under the authority of SAC but of other national ministries. Most TCs and SCs developing sector standards are under even closer control by state-run ministries in comparison to national standards because TCs and SCs are headed by research institutions that are fully funded by the respective ministry. For example, a sector standard developed under the umbrella of the Ministry of Industry and Information Technology (MIIT) has a secretariat run by a research institute funded by MIIT.[27] This provides the ministry direct oversight of the standards development process. At the end of September 2019, 62,262 sector standards were in place.[28]

Before the reform process of 2014-17, both mandatory and voluntary sector standards existed. Since then, mandatory sector standards are almost completely removed. Theoretically, sector standards can still be mandatory. However, the process of turning a voluntary sector standard into a mandatory one requires the full consent of all China State Council ministries. This makes the process lengthy and highly bureaucratic. As a result, almost all sector standards are voluntary on paper.[29] However, similar to voluntary national standards, most Chinese industry treats voluntary sector standards as mandatory.[30]

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**25** SAMR/SAC (2019): Participation in Chinese National Standards Work vs. Sector Standards Work vs. Association Standards Work. Presentation to the SAC-CEN/CENELEC Strategy Dialogue, October 2019, Shanghai.
**26** Author interview with a standard representative of a Chinese national champion, Shenzhen, October 2019..
**27** Author interviews with a standard representative of Chinese company, Shanghai, October 2019..
**28** SAMR/SAC (2019): Participation in Chinese National Standards Work vs. Sector Standards Work vs. Association Standards Work. Presentation to the SAC-CEN/CENELEC Strategy Dialogue, October 2019, Shanghai.
**29** Author interviews with international standardisation experts and officials based in China, Shanghai and Beijing, October-November 2019.
**30** Author interview with a Chinese researcher investigating technical standardisation, Beijing, November 2019.

In a nutshell, party-state control over national standards and sector standards has been gradually lifted. The number of mandatory standards was drastically decreased and the development of standards is carried out in TCs, SCs, WGs and expert groups consisting of industry. However, neither local Chinese nor foreign-funded industry active in the PRC consider national and sector standardisation an industry-driven endeavour. Instead, they complain that the development and revision of national and sector standards is highly bureaucratic and time consuming. National and sector standards are considered the most crucial, but are criticised for not necessarily meeting market requirements.[31]

> *"It is not us driving the development of national and sector standards. This is the agenda of the government. [...] Innovation is quick, but a decision to amend a national or sector standard takes forever. The problem is that the ministry officials have no technological knowledge. This makes it very difficult to convince them."*[32]

The lack of national ministry officials' technical expertise might make it more difficult for industry to convince these institutions of initiating or revising existing technical standards. At the same time, once ministries have been convinced and give the green light for the development or revision of technical standards, lacking expertise on the part of the party-state empowers industry in the processes of developing standards.

> *"Authorities are simply unable to lead the concrete development of technical standards. They do not have the knowledge. [...] It is true that ministries guide the process, but very often they can hardly say more than 'we must be leading in 5G,' or: 'we need the highest technical standards.' How to fill these very general guidelines with substance is shaped by industry discussions."*[33]

Hence, while party-state institutions control the framework (i.e. leadership, process, and decisions over development and revision of standards), the actual technical development is largely in the hands of industry due a lack of expertise on the side of the ministries.

The third type of state-driven standardisation, *local standards*, is developed under the framework of local governments. Local standards are valid only in the respective geographical entity. On paper, local standards are supposed to meet specific local requirements. In most cases, however, local authorities utilise local standards to serve their own agenda. Most crucially, local standards serve protectionist purposes. Local standards are protectionist because usually only local suppliers manufacture in accordance with the local standards of their respective local constituency. Hence, only local industry complies with local standards. In other words, a company based in southern China might not be able to compete over local projects in northern China because in their production they apply the technical standards of their southern Chinese home province that might differ from technical standards in other northern Chinese provinces and vice versa. This phenomenon is not an exclusive one to the domestic Chinese context, but is well-known in the international arena as well. Therefore, technical standards are subject to international trade law under the World Trade Organization (WTO). The WTO judiciary treats national standards that contradict international ones as technical barriers to trade (TBT). A similar protectionist logic applies to China domestically. Whenever local governments find it useful, they can reference local standards as basic requirements in public procurement, effectively excluding potential competitors from other provinces.[34]

> *"Technical standards tend not to be part of public procurement and procurement of state-owned enterprises in China. [...] When local governments want to protect local industry, they can change their minds and make compliance with a local standard a requirement for participation in public tenders. [...] Local standards are supposed to serve local needs, but in fact they are domestic technical barriers to trade."*[35]

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**31** Author interviews with Chinese standardisation officials, experts and leading think tanks, Beijing, November 2019.
**32** Author interview with a standards expert of a Chinese national champion, Shenzhen, October 2019.
**33** Author interview with a Chinese standardisation expert working for a European company, Beijing, November 2019.
**34** Author interviews with members of leading Chinese think tanks researching public procurement and technical standardisation, Shanghai and Beijing, October-November 2019.
**35** interview with an international technical standardisation expert based in China, Beijing, November 2019.

Similar to sector standards, the reform of 2014-18 effectively abolished mandatory local standards. However, local industry mostly treats local standards as if they were mandatory.[36] This demonstrates that all three types of state-driven standards remain subject to massive party-state influence.

### b. Market-tier standards: association standards and enterprise standards

In contrast to all three previously discussed state-driven standards, *association standards* are supposed to be shaped by Chinese industry. This type of standard was newly invented in the 2014-18 standardisation reform mandating all private entities in China holding the status of a non-governmental organisation (NGO), acquired from the Ministry of Civil Affairs under the Chinese State Council, to develop technical standards. On paper, this provides only very little party-state control over the development of association standards.

In fact, the government's encouragement to develop association standards has led to a tremendous growth in the number of standards. Standard-developing associations are asked to register technical standards in a national standardisation platform. Within only three years, 2,700 associations have registered 9,790 technical standards with the national standardisation platform.[37] The result is a multitude of overlapping, competing and contradictory technical standards.

In reaction, the party-state has recently started to voice its dissatisfaction with the multitude of association standards. What is instructive is not the party-state's criticism of association standards – their plurality and diversity has, to no international experts' surprise, indeed turned out to be challenging –, but the fact that the number of new association standards decreased almost immediately.[38] This demonstrates that private standard-setting associations do listen to informal window guidance from the party-state's authorities.[39]

For industry, not least for European businesses, the multitude of standard-developing associations makes it difficult to identify which associations are most important. By trend, associations fulfilling the following four criteria can be considered most relevant:[40]

- Associations that see their technical standards referenced in national regulations or are mentioned in the communications of national ministries including SAMR/SAC and/or public media should be considered of high relevance.
- Before the 2018 Standardisation Law allowed all associations to issue technical standards, a pilot phase included 38 associations, later expanded to 114 associations, developing association standards. The 114 associations that were part of the pilot project to test the development of association standards are still considered to be of particular relevance.
- The membership of standard-developing associations is another crucial criterion to identify particularly influential entities. If national champions, including but not only state-owned enterprises (SOEs) take part in the development of technical standards, they are widely regarded as having more relevance.
- Finally, the geographical scope of a standard-setting association carries some indication of its importance. Associations that act on a national level should be more influential than those restricted to the local level.

Strikingly, three of these four criteria point to the party-state's influence in supposedly market-driven standardisation. The first criterion directly relates to party-state authorities referencing associations. The second criterion equally refers to a number of 114 associations that received the endorsement of the party-state. The third criterion, finally, points to the importance of particular companies, namely national champions. Research on the political-economic foundations of the PRC has provided evidence that even if national champions are not formally state-owned, many of them remain heavily influenced by the party-state.[41] Party-state influence includes but is not limited to preferential treatment, soft lending, and party cells within Chinese companies.

This points to a fundamental difference between European and US standardisation on the one hand and Chinese technical standardisation on the other hand.

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**36** Author interviews with Chinese standardisation experts and members of leading think tanks, Beijing, November 2019.
**37** SAMR/SAC (2019): Participation in Chinese National Standards Work vs. Sector Standards Work vs. Association Standards Work. Presentation to the SAC-CEN/CENELEC Strategy Dialogue, October 2019, Shanghai.
**38** Author interviews with international and Chinese standardisation officials, several cities, April-September 2019.
**39** Author interviews with standardisation experts of several Chinese companies including a national champion, several cities, October-November 2019.
**40** The four criteria are based on information gained from author interviews with Chinese and European standardisation officials and experts all based in China, several cities, October-November 2019.
**41** Mark Wu, "The 'China, Inc.' Challenge to Global Trade Governance," *Harvard International Law Journal* 57: 2, 2016, pp. 261-324; Tobias Ten Brink, *China's Capitalism. A Paradoxical Route to Economic Prosperity*, Philadelphia, University of Pennsylvania Press, 2019.

Even where technical standardisation has become more industry-driven in China, party-state control remains in place given the influence of the Chinese Communist Party (CCP) on all major commercial entities.

> *"Our economic structure is very different from Europe. This has consequences for technical standardisation in China. In Europe, industry and state are separate entities and tend to compete over influence. This is not how we see the relationship. Industry is rather a partner of the state. This is why we need to closely coordinate technical standardisation with the authorities. After all, it is about how we develop China."*[42]

More fundamentally, Chinese industry associations have stronger ties to the party-state than their formal nature as business associations or chambers might suggest. According to Milhaupt and Zheng, many of these associations "designed to coordinate activities within an industry [...] are staffed by former government officials from defunct ministries and have the same organisational structures and functions as those ministries."[43]

Finally, the second type of industry standards is *enterprise standards*. On the surface, enterprise standards appear to be only a company's product specifications. A closer look uncovers, however, that they also serve as an instrument of party-state oversight and guidance. Enterprises are encouraged to register their enterprise standards with the state authorities providing public agencies a better overview of product characteristics, no matter whether developed by state-owned or privately-owned companies. In Europe, in contrast, enterprises simply issue product specifications, which are not part of any central registry.

The history of enterprise standards is instructive to understand the dynamics behind state control. Back in the 1990s, all products in China were required by law to fulfil a standard in order to increase accountability. Whenever companies produced in a field where no technical standards existed, they were required by law to establish an enterprise standard. The idea behind it was to have a threshold against which state authorities could test and hold accountable the manufacturers.[44]

An even more effective tool for party-state guidance of enterprise standards is the national "top runner system" that aims to identify the best, by some actors referred to as the "golden enterprise standards".[45] This tool provides party-state authorities with the possibility of utilising industry-driven standardisation for its industrial policy and keeping a guiding function, even within supposedly market- and industry-driven sections of the technical standardisation system.

> *"The top runner system [for enterprise standards] is one among many tools available to the authorities to steer the Chinese standards that are supposed to be private[-driven]. In many cases, it is not clear why the authorities chose one standard as the golden standard over another. [...] Enterprise standards are one way for private companies to compete over support from the authorities."*[46]

All this demonstrates that while China's recent standardisation reform has strengthened industry, the PRC's party-state continues proactively steering standardisation, giving the authorities a much more prominent role in the process compared to the European approach of private industry-driven self-regulation. At the same time, the party-state is not comprehensively controlling the process, but it is rather an alliance of public authorities and industry that is closely interwoven with the party-state that drives China's technical standardisation. I thus speak of an essentially state-driven approach instead of leaving it with the term "state-control".

### c. Technical standardisation as a means of Chinese industrial policymaking

For the Chinese party-state, technical standards are a means to implement its industrial policies. In previous years even after its accession to the WTO in 2001, domestic technical standards were systematically used for protectionist purposes. Not only did China formulate technical standards distinct from international ones in order to make it more difficult and costlier for international companies to enter the Chinese market (technical standards constituted a TBT). With China's turn to economic reform – particularly after 2015 –, technical standards are utilised for a new industrial policy goal: the improvement of product quality. This falls in the context of broader Chinese economic reform aiming to move up the

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**42** Author interview with a member of a leading think tank researching technical standardisation, Beijing, November 2019.
**43** Curtis J. Milhaupt and Wentong Zheng, "Beyond Ownership. State Capitalism and the Chinese Firm," *The Georgetown Law Journal* 103: 3, 2015, pp. 665-722.
**44** Author interview with an international standardisation expert based in China, Beijing, November 2019.
**45** Author interviews with standardisation experts of Chinese companies and senior Chinese researcher analysing technical standardisation, Beijing, November 2019.
**46** Author interview with a Chinese researcher focusing on technical standardisation, Beijing, November 2019.

value chain and produce higher end products in order to avoid the middle-income trap and meet the challenges arising from lowering growth rates ("the new normal").[47] For a long time, China's economic success largely rested on lower labour costs stemming from rapid urbanisation. This competitive advantage has come to an end since there remains hardly any additional urbanisation potential in the Chinese labour force ("Lewis turning point").[48] As a consequence, the Chinese party-state has rightly identified the need for economic reform having to increase the value added to global supply chains.

Most crucially, Chinese Prime Minister Li Keqiang announced in 2015 the "Made in China 2025" agenda identifying ten industry sectors in which China aims to turn into a world leader with most innovative technology. Strikingly, several of these industry sectors, namely information technology, railway equipment, power equipment and medical devices among others are among the fields in which we see the most Chinese technical standardisation. This is no surprise since Made in China 2025 comes with enormous sums of investment into innovative research and development, which in turn is the basis for technical standardisation. While the concrete mechanisms of the party-state's encouragement and promotion of research and standardisation in these sectors are not public it is clear that macroeconomic considerations and party-state steering are crucial to understanding why China develops technical standards in some but not in other economic sectors. In a word, technical standardisation is yet another means of industrial policymaking and follows overarching frameworks such as Made in China 2025. More recently, the PRC leaders hardly refer to the concept of Made in China 2025 anymore – mostly for reasons of rhetorical strategy. The priorities that are spelled out in Made in China 2025 remain in the same.

Technical standards have turned into a tool for the party-state's industrial policy to raise product quality. Internationally, standards are perceived as good if they find broad consensus in formulating a minimum requirement. In China, a technical standard is often regarded as good if it sets a high-quality standard and is thus difficult to meet. Hence, for China technical standardisation is not an instrument of industry coordination aiming to facilitate interoperability and trade, but to actively incentivise compliance with the party-state's industrial policy goals.

> *"Our situation is very different from yours. We need better quality and therefore higher technical standards. It is a national requirement and not a matter of company decisions. This is why standardisation is so important for China."*[49]

Given that China continues to approach technical standardisation as an essentially state-driven endeavour to serve the industrial development goals of the state, it is not surprising that China launched a centrally planned investigation of technical standards, known as the "China Standards 2035" (中国标准2035, Zhōngguó biāozhun 2035) program in 2018. However, contrary to many observers' intuition that this is yet another attempt to establish central control,[50] "China Standards 2035" carries the potential of facilitating the continuation of reform and strengthening of the industry over public authorities.

### 4.2. The contested state-driven approach: "China Standards 2035", bureaucratic rivalry and the prospects for further reform

Although it is unlikely (and impossible given the state-permeated character of the Chinese economy) that China will adopt a fully industry-driven approach to technical standardisation, some recent reform efforts point to the possibility of some convergence. In order to facilitate the improvement of the Chinese standardisation system, SAC has launched a major research program titled "China Standards 2035". The project is due to publish its final report and will essentially suggest the following reform steps:[51]

- Reduce the number of standard types from five to two (or three), building a binary standard system composed of national standards and association standards only.
- Increase international cooperation and integrate more deeply into the international standardisation system led by ISO and IEC.

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**47** Barry Naughton, "The Challenges of Economic Growth and Reform," *China in the Era of Xi Jinping. Domestic and Foreign Policy Challenges,* edited by Jo Inge Bekkevold and Robert S. Ross, eds., Washington D.C., Georgetown University Press, pp. 66-91, 2016.

**48** Ming Xia, "China's Financial Crisis in the Making – Soft Budget Constraint, Overdraft and the Missing Credible Commitment," *Journal of Chinese Political Science* 23: 1, 2018, pp. 9-32.

**49** Author interview with a Chinese standardisation official, Qingdao, October 2019.

**50** Rebecca Arcesati, "Chinese Tech Standards Put the Screws on European Companies," *Merics,* accessed: 2019-04-11, at: https://www.merics.org/de/blog/chinese-tech-standards-put-screws-european-companies; Elsa Kania, "Much Ado About Huawei (1)," *The Strategist,* accessed: 2018-09-30, at: https://www.aspistrategist.org.au/much-ado-huawei-part-1/; Elsa Kania, "Much Ado about Huawei (2)," *The Strategist,* accessed: 2018-09-30, at: https://www.aspistrategist.org.au/much-ado-huawei-part-2/

**51** SAMR/SAC (2019): Introduction of "China Standards 2035" Project. Presentation to the SAC-CEN/CENELEC Strategy Dialogue, October 2019, Shanghai. Author interviews with Chinese standardisation officials and experts, Qing-dao, October 2019.

- Establish an administrative and social supervision system for association standards and give guidance to cultivate a group of powerful standard associations that can truly meet the needs of the market and innovation.

All of these three issues on the reform agenda carry significant implications for China's state-driven standardisation system:

Firstly, streamlining technical standards to a two-tier system would reduce party-state influence stripping ministries other than SAMR/SAC and local governments off their technical standardisation portfolios. Accordingly, this proposal has met significant push-back from affected bureaucracies. Exemplary is what a local standardisation official told the author of this study.

> *"This project [China Standards 2035] is very bad for China. Our development is uneven, and we need to make sure that we meet the challenges of all parts of our country. It would be terrible if we followed the recommendations and abolished sector standards and local standards."*[52]

Considering these comments, it is no wonder that "China Standards 2035" is perceived as being an agenda that is mostly backed by SAMR/SAC, which, in turn, raises doubts on whether "China Standards 2035" will be legislated any time soon.

SAMR/SAC consists of some 70-80 officials and is institutionally relatively weak compared to other national ministries such as MIIT or the Ministry of Ecology and Environment, two strongholds in sector standards. Even many local standardisation agencies have more personnel than SAMR/SAC. The Chinese province of Shandong alone employs more than 400 people that deal with technical standardisation.[53] This provides a rough indication of the strength of bureaucratic resistance to be expected against SAMR/SAC-backed "China Standards 2035" proposals.

> *"We know that we have a long way to go for implementing the proposals. I do not expect we can take a decision before 2023 and we will need 5-10 years for the whole reform. […] We need to improve our standards system. Therefore, we push forward."*[54]

Given the relatively slim structure of SAC, the streamlining of the standards system would empower China's industry and party-state influence would mostly rest on the state-permeated character of the overall economy. In this context, SAMR/SAC clearly are reform-driving actors that aim at a strengthening of the market.

> *"When studying the overseas standardisation* systems*, we can see how we could improve. We have taken steps forward, but we know we should strengthen industry and market further. China needs the most efficient standards system."*[55]

Secondly, this speaks to the next item on the above listed China Standards 2035 reform agenda, i.e. the increase in international cooperation. SAMR/SAC are in regular contact with international standardisation experts and have adopted many ideas, even though they claim that a future standardisation system should conform to "the Chinese culture".[56] Issues that China seems particularly willing to learn from Europe include the governance of SEPs (e.g. disclosure and licensing), setting the boundary between industry and government in developing and using standards, and linking and balancing domestic and international standards.[57]

Thirdly, the last major reform goal of the China Standards 2035 agenda, however, underscores that SAMR/SAC does not want to give up party-state control altogether. Instead, SAC has identified competition and contradiction between different standards – not least national and association standards – as a crucial challenge that requires reform.[58] Suggestions to better control association standardisation and cultivating a group of powerful standard associations would surely increase party-state control over the industry-driven tier of China's domestic standardisation system. Underlying is a deep-seated scepticism towards private self-regulation.

> *"China has no tradition of private self-regulation. In China, companies usually try to circumvent or reinterpret laws and regulations to their own advantage. Local governments do the same with directives from the central government. This is why it is very difficult to explain the concept of private self-regulation to the Chinese side. The idea that*

**52** Author interview with a local Chinese standardisation official, Qingdao, October 2019.
**53** Author interview with a senior local Chinese standardisation official, Qingdao, October 2019.
**54** Author interview with a senior Chinese standardisation official, Qingdao, October 2019.
**55** Author interview with a Chinese standardisation expert, Qingdao, October 2019.
**56** Author interview with a senior Chinese standardisation official, Qingdao, October 2019.
**57** Author interviews with several Chinese standardisation experts and officials, Qingdao and Beijing, October-November 2019.
**58** Author interview with a Chinese standardisation official, Qingdao, October 2019.

> *private actors take responsibility and work in partnership with state authorities is counterintuitive to the Chinese."*[59]

Despite the intention to tighten party-state control over association standardisation, "China Standards 2035" represents a clear reform agenda to empower Chinese industry to some extent. It does not aim for Europe's industry-driven PPP, but for a Chinese-style PPP, in which party-state supremacy prevails but industry influence grows.

Even though the prospects for the full implementation of China Standards 2035 are slim, the reform agenda provides an indication of the direction further reform could take. It also lays open the bureaucratic infighting between different Chinese actors. SAMR/SAC clearly appears to be the most reform-oriented actor. In fact, many suggestions from "China Standards 2035" had already been on SAC's agenda during the last reform cycle (2014-2017).[60] Given SAMR/SAC's relatively weak bureaucratic footprint, it aims to utilise all available means, not least presenting China Standards 2035 to the outside world, hoping to raise European expectations and thereby pressure other parts of the party-state, which remain more sceptical to further reform.

### 4.3. Towards a convergence of European and Chinese standardisation?

A brief comparison of the European (and US) approach to technical standardisation outlined in section III and the Chinese system described in section IV emphasises the enormous differences. Most crucially, technical standardisation is an industry-driven domain in Europe with public authorities (EU Member States and the EC) rather providing a general framework. In China, all five types of technical standardisation remain state-directed, even if they are supposed to be market-driven (i.e. association standards and enterprise standards).

Technical standardisation in China is, however, also not fully state-controlled. The PRC is undergoing a significant transformation – a process that appears to be open-ended at the moment. It remains unlikely that China will adapt the industry-driven approach; but the "China Standards 2035" program clearly indicates willingness in parts of the Chinese party-state to fundamentally rethink technical standardisation and strengthen private participation.

Hence, China's state-driven approach to technical standardisation bears the potential of questioning the existing industry-driven order of technical standardisation. This holds true particularly in light of China's engagement in *international* technical standardisation that I turn to in the next section.

## 5. Going out: China's standards for the world?

The discrepancy between the European, the US, and the Chinese standardisation system is not problematic in the first place. To some extent, the three standardisation systems reflect their different economic challenges. The European Union has undergone an unprecedented economic integration process that required the harmonisation of technical standards across the continent. The resulting interoperability was fundamental for the development of the European Single Market. The US is following the idea of least state interference giving full play to market competition. China's economic development, in contrast, is largely a result of pragmatic and flexible economic policies that allowed for great divergences in policy, regulation, and law across a very unevenly developed domestic economy.[61] Moving the Chinese economy up the global value chain has made product quality and innovation the PRC's new priority.[62]

In two regards, however, China's growing footprint in technical standardisation could reshape the existing order of technical standardisation. Firstly, China's rising influence in *international* technical standardisation might lead third countries to study the Chinese approach and make the PRC a role model. If this becomes the case, the idea of technical standardisation as a private self-regulatory – rather than state-centric – domain would be questioned.

Secondly, similar to its domestic technical standardisation, the PRC makes systematic use of the state-permeated character of its economy and its standardisation system in the international arena as well. Taken together, both elements carry enough

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**59** Author interview with European standardisation official, Brussels, June 2019.
**60** Author interview with an international standardisation expert based in China, Beijing, November 2019.
**61** Tobias Ten Brink, *China's Capitalism. A Paradoxical Route to Economic Prosperity,* Philadelphia, University of Pennsylvania Press, 2019.
**62** Barry Naughton, "The Challenges of Economic Growth and Reform," *China in the Era of Xi Jinping. Domestic and Foreign Policy Challenges*, edited by Jo Inge Bekkevold and Robert S. Ross, eds., Washington D.C., Georgetown University Press, pp. 66-91, 2016; Nicholas R. Lardy, *Markets over Mao. The Rise of Private Business in China,* Washington D.C., Peter G. Peterson Institute for International Economics, 2014; Nicholas R. Lardy, *The State Strikes Back. The End of Economic Reform in China?*, New York, Columbia University Press, 2019.

potential to challenge the existing international technical standardisation order. What used to be an unquestioned domain of private self-regulation might turn into yet another field of political competition among sovereign nation states. This is not to say that private self-regulation is unproblematic and necessarily favourable to state decision-making. One can argue that states are at least supposed to rest their legitimacy on popular support while companies even lack such legitimating aspiration.

Nevertheless, in contrast to such a state-centric line of argument, one can emphasise that a growing presence of state actors in technical standardisation could turn this important sub-order of international economics and trade in yet another area of geopolitical competition. From this standpoint, such a development rather fuels conflict and rivalry. Hence, one might claim that the focus on technical solutions is replaced by power politics, making it more difficult to generate interoperability facilitating the exchange of goods, services and data across borders. In essence, the second perspective subscribes to a globalisation-optimistic perspective and aims to preserve a liberal international economic order of which technical standardisation is a crucial, often overlooked, part.

Normatively assessing the implications of the development is ultimately a trade-off. This study does not aim to decide whether a potential increase of legitimacy by means of a strengthened role for states outweighs the negative implications of technical standardisation turning into yet another field of power politics instead of technological cooperation. Instead, I focus on analytically describing the challenge to the existing international order of technical standardisation. Insofar, it confirms European concerns stemming from the normative differences inherent in the Chinese technical standardisation system. China's growing footprint puts into question whether the international technical standardisation order, with its fundamental principle of an industry-driven PPP, will prevail unchallenged as used to be the case. For Europe, this carries two potential risks: Firstly, the turning of technical standardisation into yet another field of geopolitical competition puts pressure on the EU to approach technical standardisation more strategically as well. This puts in question a successful European approach of an industry-driven PPP that has been crucial for the development of the Single Market. Secondly, it will reduce European influence in international technical standardisation since Europeans have greatly profited from its technology-driven harmonised approach.

In this section, I summarise the international dimension of China's standardisation policy. I do not argue that the PRC's efforts are necessarily illegitimate, but rather aim to carve out the increasing Chinese influence and the underlying role of China's state-centric approach to technical standardisation and economic policy-making. First, I turn to China's growing impact in existing international standardisation organisations (section A). Next, I summarise Chinese efforts outside of these institutions (section B). I point out that the standards dimension of China's BRI is particularly challenging for Europe. Finally, I briefly summarise the findings focusing on their potential impacts on the future technical standardisation order.

### 5.1. China's growing footprint in international standardisation organisations

Throughout the last decade, the Chinese leadership's prioritisation of technical standardisation has seen a continuous rise. The reasons for the PRC's growing investment in international technical standardisation are manifold.

> *"I think most important is the fundamental economic transformation to high-quality production. Technical standardisation simply had to become a priority in the wake of our economic reform process. […] Ironically, we [Chinese] understood the value of technical standards much better than Trump did. […] If we needed any reminder of the value of standards, then transatlantic negotiations [of the Transatlantic Trade and Investment Partnership (TTIP)] came at the right time. Our leadership feared that the US and the EU could set the industry standards of the future. When TTIP failed, we were happy to step in and fill the vacuum."*[63]

This exemplary quote demonstrates that even though China's technical standardisation policy remains primarily motivated by domestic reform efforts, the PRC's leaders do have international strategic dimensions in mind as well. Accordingly, it is no wonder that China has massively increased its efforts and presence in existing international standardisation organisations, namely ISO, IEC, ITU and 3GPP.

China's efforts have been successful and the PRC's footprint in international technical standardisation is growing.

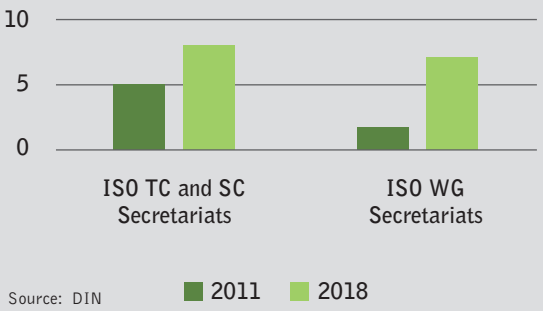
The most obvious sign of China's increased influence is its growing share of leadership positions in international institutions. In the period 2015-2018, Zhang

**63** Author interview with a member of a leading Chinese think tank, Shanghai, October 2019.

Xiaogang served as the first Chinese president of ISO. Shu Yinbiao is president-elect of IEC and had been the organisation's Vice-President from 2013 to 2018. Zhao Houlin is currently serving his second term as General-Secretary of ITU.

More impact on the development of technical standards has China's growing share of secretariat positions in ISO's and IEC's TCs, SCs and WGs. From 2011 to 2018, China's share of TC and SC Secretariats in ISO grew from 5% to 8.21%. In the same period, its share in WG Secretariats rose from 2% to 6.58 %, according to calculations by the German standardisation body DIN (see **figure 4)**. In absolute terms, however, China (SAC, holding 63 Secretariats) is still behind Germany (DIN, holding 132 Secretariats), the US (ANSI, 104 Secretariats), the United Kingdom (BSI, 77 Secretariats), France (AFNOR, 77 Secretariats), and Japan (JISC, 74 Secretariats). In IEC, Germany holds the most secretariat positions (36), followed by the US (26), Japan (24), France (22), United Kingdom (20), and Italy (13). China leads as many TCs and SCs in IEC as the Republic of Korea (both holding 10 secretariats) (see **figure 5**).[64]

**Figure 4: Chinese share (in %) of leadership positions in ISO,**



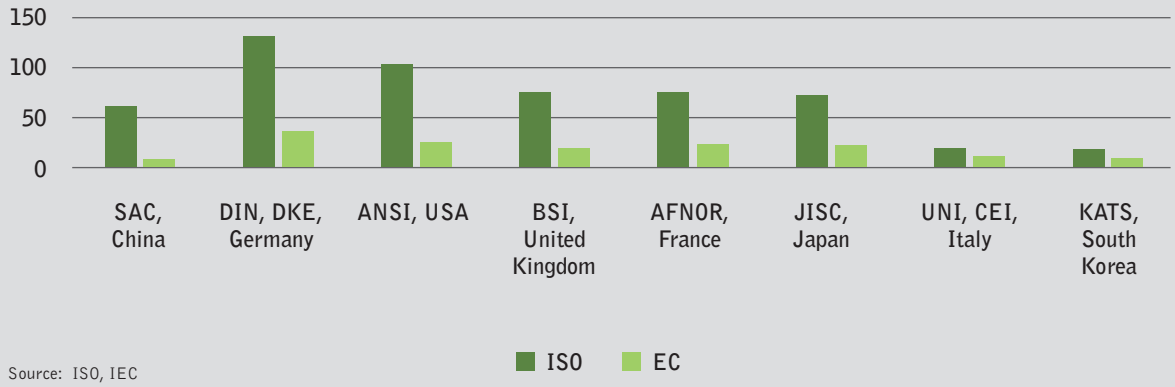

Source: DIN

In both institutions, China is proposing many more new standards than only a few years ago.[65] To this day, a high number of proposals are rejected in an early stage due to quality issues.

> *"China has very well understood the usefulness of setting standards. It provides prestige and influence. This is why the Chinese are submitting a high number of work item proposals [to establish a new standard]. They know that many of their proposals will fail. In many cases, they are not even able to explain why a specific standard is technically necessary. But they do not care much about how many are rejected as long as they increase their impact on the agendas and outputs of international standardisation bodies."*[66]

If China's state-centric technical standardisation policy is successful, third countries might decide to follow the Chinese example. European influence and prestige as the leading actor in international technical standardisation has prompted China to study the European approach. In the future, the PRC could turn into a similar role model for third countries, particularly in the developing world.

**Figure 5: Total of ISO and IEC secretariats, selected countries**




Source: ISO, IEC

64 If not explicitly indicated, all quantitative data on leadership positions is according to ISO and IEC information as of 1 December 2019.
65 Author interviews with international technical standardisation officials and technicians as well as Chinese technical standardisation experts and officials, several cities, December 2018-November 2019.
66 Author interview with a European technical standardisation official, Brussels, May 2019.

### a. Learning, adapting, making use of the state-permeated economic structure: Chinese policies to increase its footprint in international standardisation organisations

Strikingly, the growth of Chinese influence in existing international technical standardisation organisations in itself is the result of learning. The PRC has carefully analysed European technical standardisation practices without fully adopting the approach.

> *"Europe is a strong power in [technical] standardisation. China can still learn from you, but I think we have improved a lot. We have studied European best practices and have grown into a standards power."*[67]

The Chinese exercise of learning from and studying the European approach to technical standardisation has not prevented the PRC from developing from it a policy more in line with Chinese interests and normative convictions. Hence, the learning process remains open-ended. The success of China's state-centric model will most likely influence the principles underlying the technical standardisation order, but it does not necessarily lead developing countries to fully adopt to the Chinese model.

Despite the uncertainty of learning and adaption processes, I believe that not only does the growing footprint of a country that domestically is running a state-directed system of technical standardisation carry some impact, but also that the PRC makes use of its *state-permeated economy* and *state agencies* in *international* technical standardisation institutions as well.

China has carefully studied both the mechanisms of European influence on international technical standardisation and academic research on the question what determines impact in those institutions. From this analysis, China has aimed to increase its technical expertise, gain first mover advantage in the commercialisation of strategic technology, capitalise market and company size, increase active engagement and contributions to international technical standardisation institutions and coordinate Chinese actors' behaviour to speak with one voice in these institutions.

Most fundamentally, the Chinese representation in ISO, IEC and 3GPP are not industry associations, but two institutions under ministries of the State Council. SAC represents China in ISO and IEC; the China Communications Standards Association (CCSA) has more independence compared to SAC, but was founded and remains under the control of the Ministry of Industry and Information Technology of the PRC's State Council.

In addition, China has tried to capitalise on the strengths of its state-permeated economy to foster its influence on international technical standardisations. Active industry policy in particularly crucial economic sectors helped the PRC to facilitate early commercialisation to gain first mover advantage (e.g. in the rollout of 5G).[68] The central leadership has assisted, if not initiated, mergers and acquisition in order to create national champions that tend to have more influence in international technical standardisation.[69] Since the CCP carries significant influence if not control over companies in strategic economic sectors, it was able to force Chinese companies into domestic coordination on technical standardisation and speaking with one voice internationally.[70] In these three regards, China has proven to capitalise on advantages stemming from the *state-permeated character* of the Chinese economy.

It remains controversial whether state involvement facilitates or rather hampers industrial innovation. Hoping for positive effects, the PRC provided preferential treatment (e.g. soft loans, tax breaks, pooling of research resources) to facilitate research and development in order to increase technical expertise. Central incentives by means of quantitative benchmarks were also meant to foster active engagement of Chinese actors in international technical standardisation institutions.[71] While it might be unclear whether China's state-permeated economy holds structural advantages in these two regards, the PRC has again adapted its strategies in international technical standardisation to the fundamental characteristics of its domestic economy with an important role of the party-state.

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**67** Author interview with a Chinese consultant focusing on technical standardisation, Shenzhen, October 2019.

**68** Milo Medin and Gilman Louie, *The 5G Ecosystem. Risks & Opportunities for DoD*, Washington D.C., Defense Innovation Board, 2019; Roma Eisenstark, "Why China and the US Are Fighting over 5G," *TechNode*, accessed: 2019-04-11, at: https://technode.com/2018/03/30/5g/; Steve Lo and Kevin Lee, *China Is Poised to Win the 5G Race*, Hong Kong, EY, 2018; Mark Scott, "Telcogeopolitics: West vs. China in 5G Race," *Politico*, accessed: 2019-04-11, at: https://www.politico.eu/article/5g-telecommunications-infrastructure-china-us-eu-qualcomm-nokia-ericsson-huawei/

**69** Nicholas R. Lardy, *The State Strikes Back. The End of Economic Reform in China?*, New York, Columbia University Press, 2019.

**70** Shan-zhi Chen and Shao-li Kang, "A Tutorial on 5G and the Progress in China," *Frontiers of Information Technology & Electronic Engineering* 19: 3, 2018, pp. 309-321.

**71** Fägersten and Tim Rühlig, "China's Standard Power and its Geopolitical Implications for Europe," *UI Brief 2/2019*, Stockholm, UI, 2019; Pohlmann, *Who is Leading the 5G Patent Race? A Patent Landscape Analysis on Declared 5G Patents and 5G Standards Contributions*, Berlin, Iplytics, 2019.

Finally, China has advantages in terms of its market size in the first place, without the need to carry out any further policies.

In a nutshell, the PRC's growing footprint in international technical standardisation is the result of carefully studying mechanisms of previous European successes and adapting these mechanisms to the state-permeated economic policy-making of China. Hence, not only the growing footprint, but also the fact that this is the result of active engagement of the party-state in contrast to the industry-driven European approach might influence the future of the international technical standardisation order.

### b. Chinese impact and its limitations on standards developed within ISO and IEC

While China's state-directed approach to technical standardisation will most likely entail some impact on the future order of technical standardisation, the question emerges whether this shift in order will also impact existing as well as newly developed technical standards. This might be particularly concerning from a European standpoint if, for example, environmental standards will be lowered.

China's state-directed approach to technical standardisation is unlikely to harm existing technical standards. Once established, international technical standards are hardly being substantially reversed unless there is new technological development that is so substantial in change that it requires new technical solutions to stay interoperable. Hence, a changing technical standardisation order will hardly lower existing standards. Newly developed international technical standards, however, are likelier to reflect Chinese interests.

> *"China has other preferences and ideas. Sometimes, Europe and China have the same goals, for example when we try to fight climate change and reduce emissions. But you cannot expect China to advocate sustainability in international technical standardisation to the same degree Europeans do. China's growing influence will impact new technical standards, but old ones will hardly be revised and lowered. If China has a problem with existing standards, it simply does not comply. It does not try to openly challenge and change the standards."*[72]

Finally, China's growing engagement in existing international technical standardisation organisations does not directly impact their level of inclusivity and transparency. At the same time, Europe's industry-driven PPP is more inclusive and transparent.

> *"Social relations are important for all economic activity [in China]. Technical standardisation is no exception. I have worked for a long time in Europe and know that you have a very inclusive system. Here in China, it is more about relationships and informal contacts. Whether a new TC is constituted or not, for example, is primarily a matter of how influential you are and what kind of network you have in the CCP. We are improving, but there is a long way to go to be as good as Europe is."*[73]

Hence, principles of participation and transparency will hardly be harmed internationally, but on national/regional levels, China's approach could serve as a role model for third countries and thereby lower the degree of inclusiveness and transparency in the overall technical standardisation system.

## 5.2. Internationalising China's domestic standards outside the existing institutions: the Belt and Road Initiative (BRI)

China's standardisation practices are not restricted to existing technical standardisation institutions. The PRC also aims to strengthen its position outside these institutions. In essence, China tries to internationalise its own domestic standards bilaterally along the Belt and Road.

The standardisation component of China's BRI is no secret. In 2015, China's main macroeconomic agency, the National Development and Reform Commission (NDRC), issued the first "Action Plan for Harmonisation of Standards along the Belt and Road" (henceforth "Action Plan") for the period 2015-2017.[74] The Action Plan openly states that China will strive to internationalise its domestic standards in BRI countries and prioritises several economic sectors. In a first step, the Action Plan lays out that 500 national (SAC-developed) and sectoral standards (developed by national ministries) should be translated into foreign languages in order to make them available internationally. At the end of 2017, the NDRC issued a new Action Plan for the 2018-2020 period that essentially follows up and perpetuates the 2015 Action Plan.[75]

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**72** Author interview with an international technical standardisation expert based in China, Beijing, November 2019.
**73** Author interview with a Chinese researcher focusing on technical standardisation, Shanghai, October 2019.
**74** SAC, "Action Plan to Connect "One Belt, One Road" Through Standardization (2015-2017)," *PRC*, accessed: 2019-02-19, at: https://www.followingthemoney.org/wp-content/uploads/2017/06/2015_Leading-Group-for-the-BRI_Action-Plan-to-Connect-BRI-through-Standardization-2015-2017_E-1.pdf
**75** SAC, "标准联通共建"一带一路"行动计划(2018-2020年)," SAC, accessed: 2018-10-26, at: http://www.sac.gov.cn/zt/ydyl/bzhyw/201801/t20180119_341413.htm

Whether China will issue a third Action Plan beyond 2020 is yet to be seen.

> *"I am not sure we will see another Action Plan. But whatever of it the authorities will publicly say, I expect a continuation of the BRI standardisation policy. Not all has been successful, but there is certainly no reason to cease standardisation efforts."*[76]

To this day, China has certainly not scaled down its standardisation efforts within the BRI. In June 2019, China officially announced it had signed 85 cooperation agreements on technical standardisation with 49 countries and regions along the Belt and Road.[77] Just three months later, this figure has risen to 90 agreements with 52 countries.[78] From a purely quantitative perspective, these efforts have been a success. There is, however, widespread consensus in China that the general cooperation agreements on technical standardisation with BRI countries are not substantial. In many cases, the agreements establish mechanisms of exchange between the standardisation bodies of the respective country and China and state in general terms to facilitate mutual learning and understanding with the ultimate goal to generate favourable economic exchanges.

> *"We have concluded many agreements and politicians and ministries talk about the high number because it is easy to quantify our success. But all the agreements that I have seen so far have no substance. They are very general. At best, they facilitate more concrete and substantial cooperation in the future."*[79]

One might argue that this is not reassuring because such general engagement could be only the first step in a process of deeper engagement that has the potential to ultimately lead to substantial economic dependencies and Chinese influence projected by means of technical standards. This might be true and Europeans are well advised to closely follow the future development. At this point in time, however, many Chinese officials and researchers are not satisfied with the general agreements criticising their lack of substance. They argue that nothing meaningful follows from such agreements. On the one hand, this widespread criticism could even turn into a driving force for China to seek more substantial arrangements. On the other hand, the traction of Chinese initiatives does not necessarily increase over time. For example, the initial euphoria among Central and Central Eastern European countries for the BRI is cooling off significantly.[80] Hence, Europeans are well advised to carefully follow the developments as Chinese initiatives could go either way.

From the assessment of most Chinese officials and experts, a major shortcoming of the currently existing agreements seems to be that they often do not address market needs and rather summarise the general intention to cooperate.

> *The Action Plans and the agreements are useless if they do not relate to a concrete project. The market does not wait for our standards, unless we link it to specific cooperation. […] If we agree with another country that they will study our railway standards, this study will lead nowhere unless we decide to build a railway together."*[81]

In line with this quote, the incorporation of technical standards into concrete BRI (infrastructure) projects is much more meaningful. In Turkmenistan, for example, 83 Chinese standards were adopted, not least to ease investments by the China National Petroleum Corporation in the South Yolotan gas field project. According to Chinese researchers, this facilitated the investments that Turkmenistan had hoped to attract and saved the Chinese company up to 15% in costs.[81]

China's technical standardisation policy within such projects carries implications for the future international technical standardisation order in at least three regards:

Firstly, internationalising domestic technical standards outside the existing institutional framework of technical standardisation bodies inherently weakens

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**76** Author interview with a member of a leading Chinese think tank research technical standardisation, Beijing, November 2019.
**77** Office of the Leading Group for Promoting the Belt and Road Initiative, "The Belt and Road Initiative. Progress, Contributions and Prospects," *Embassy of the People's Republic of China in Sweden*, accessed: 2019-09-22, at: http://www.chinaembassy.se/eng/zgxw/t1675676.htm
**78** Official announcement at the Qingdao Forum for International Technical Standardisation.
**79** Author interview with a senior Chinese researcher investigating Chinese technical standardisation policy, Bei-jing, November 2019.
**80** Erik Brattberg and Etienne Soula, "Europe's Emerging Approach to China's Belt and Road Initiative," *Carnegie Endowment for International Peace*, accessed: 2019-08-29, at: https://carnegieendowment.org/2018/10/19/europe-s-emerging-approach-to-china-s-belt-and-road-initiative-pub-77536
**81** Author interview with a member of a leading Chinese think tank researching technical standardisation, Beijing, November 2019.
**82** Feng Tian, "Standard Setting and Institutional Building for International Infrastructure," *Routledge Handbook of the Belt and Road*, edited by Fang Cai and Peter Nolan, eds., London, Routledge, pp. 341-345, 2019.

those institutions. One should bear in mind, however, that European companies do not always support international technical standardisation institutions either.[83]

Secondly, some domestic Chinese technical standards internationalised outside the existing institutions contradict established international standards.[84] In private conversations, Chinese standardisation officials admit that they "cannot rule out" that technical standards internationalised as part of the BRI contradict existing international standards.[85] At the same time, BRI projects do not necessarily internationalise domestic Chinese standards. ISO and IEC standards are applied as well as domestic ones depending on the respective project, the involved industry and the standards that are underlying the production of the Chinese companies mostly involved.

> *"The project-driven standardisation component of the BRI is heavily influenced by industry. […] In most cases, the respective company is directly involved in the wording of the standards clauses of the contracts."*[86]

The primary goal of industry is making profit, not following a national strategic objective. Hence, whenever companies follow international standards in the first place, they advocate for their inclusion in BRI projects.

> *"In many cases, China's globally operating industry regularly applies international standards where they exist because this provides the most business opportunities to them globally. Companies that mostly produce for the domestic market are much more reluctant to do so. In some BRI projects, we witness direct competition between different Chinese commercial entities over the standardisation clauses, which they want to be in conformity with their company policy."*[87]

Thirdly, the BRI is a project of the party-state. Chinese companies hold strong commercial interests and have gained significant influence on the development of the BRI. However, the BRI remains closely intertwined with the strategic considerations of the party-state.

Most fundamentally, Chinese actors driving the BRI are often state-controlled, including the ones that are involved in the underlying technical standardisation policy.

> *"BRI projects tend to have heavy state involvement. This is natural given that it focuses on infrastructure projects that receive state-backed funding. These funds go often to state-owned companies or formally private-run companies with very close ties to our political leadership."*[88]

This implies that BRI projects with a technical standardisation component come with heavy state influence. In essence, most of these projects come as package deals that include financing, designing and construction of infrastructure. Developing countries are offered soft loans and other export subsidies to develop critical infrastructure, such as roads, railways, pipelines, digital infrastructure or ports. In return for such deals, recipient countries often have to accept that the domestic Chinese technical standards are underlying the design of the respective infrastructure project, which is often implemented by Chinese national champions.[89]

Accepting domestic Chinese standards instead of international ones comes with lock-in effects. Countries building their infrastructure on Chinese technical standards depend on Chinese manufacturers for decades to come. Maintenance of existing infrastructure or buildout of infrastructure compatible with it is only possible with suppliers that follow Chinese technical standards. This effectively excludes all but Chinese manufacturers. The result is that BRI countries depend on Chinese technology to maintain their critical infrastructure. China could utilise such lock-in effects to extract political concessions from BRI countries in the future.

In essence, the technical standardisation component of China's BRI is a cornerstone of a new type of geopolitics in which the PRC aims to bolster its impact on countries along the Belt and Road. Influence is pursued through the buildout of critical infrastructure and technical standards are a crucial means to not just set up this infrastructure, but make sure it

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**83** For example, European railway industry is divided over the question whether to seek global technical standards in the sector or prefer having a fragmented standards landscape with European standards differing from standards in other regions.

**84** Author interviews with European technical standardisation officials, several cities, February-August 2019.

**85** Author interviews with Chinese technical standardisation officials, Brussels, March 2019. At the same time, one should not neglect that others are based upon existing standards. For example, the Chinese Digital Television Standard does not contradict ITU specifications and is applied in 14 countries serving nearly 2 billion people Feng Tian, "Standard Setting and Institutional Building for International Infrastructure," *Routledge Handbook of the Belt and Road*, edited by Fang Cai and Peter Nolan, eds., London, Routledge, pp. 341-345, 2019.

**86** Author interview with a senior member of a leading Chinese think tank researching technical standardisation, Beijing, November 2019.

**87** Author interview with a member of a leading Chinese think tank analysing technical standardisation, Beijing, November 2019.

**88** Author interview with a senior Chinese researcher analysing technical standardisation, Beijing, November 2019.

**89** The Telegraph, "Belt and Road Projects. Past, Present and Future," *t*, accessed: 2019-09-22, at: https://www.telegraph.co.uk/china-watch/business/belt-road-projects-list/; Jincui Yu, "Western Countries Should Learn to Adapt to Chinese Standards," Global Times, accessed: 2019-09-22, at: http://www.globaltimes.cn/content/1157572.shtml

will rely on Chinese maintenance and it will only be extended with Chinese suppliers. One can summarise China's new geopolitics as an attempt to establish control over the infrastructure that is necessary for the flow of critical information and data as well as goods and services ("flow control"). Hence, the technical standardisation component of the BRI is highly strategic and geopolitical in nature.

The PRC openly states that it aims to spread its technological influence by means of technical standards. Chinese leaders are correct when arguing that this is not just a Chinese but also a Western practice.[90] However, in Europe, technical standards do not fall in the state's domain, making it more difficult to leverage. Once again, China's state-directed approach to technical standardisation has the potential to change the role of international technical standardisation and, with it, the future order of technical standards.

### 5.3. Reshaping the international order of technical standardisation?

We can conclude that the divergence of European and Chinese approaches to technical standardisation carries the potential of far-reaching consequences beyond the domestic sphere. China's growing footprint in international technical standardisation institutions and concluding bilateral agreements outside of these institutions might lead developing countries to study the Chinese success and take the PRC as a role model. Even if learning usually comes with adaptation, the Chinese example could undermine the previously unquestioned idea that technical standardisation is an industry-driven domain.

This is even more the case since China's approach to technical standardisation is shaped by party-state influence and the character of its state-permeated economy not only in the domestic, but also the international sphere. The PRC aims to leverage the advantages of central planning and economic policymaking to influence existing international standardisation institutions as well as internationalising domestic Chinese technical standards along the BRI as part of concrete infrastructure projects. Hence, the existing order of technical standardisation is faced with a strategic Chinese policy and the increasing influence of the Chinese state-directed approach. This carries the potential to reshape the future of the international technical standardisation order.

## 6. Conclusion

In this concluding section, I summarise the findings of the study, focusing on questions of whether and how China's growing footprint in technical standardisation will bring about a new standardisation order (section A) and discuss the implications for Europe, not least under the conditions of a growing weaponisation of connectivity and technology decoupling (section B).

### 6.1. Brief summary

With the end of the unipolar moment and the return of geo-economics to international affairs, technical standardisation is undergoing a process of politicisation. Gone are the days when technical standards were treated as a non-political enabler of globalisation, providing interoperability that was widely perceived to be a common good. Technical standards have never been as apolitical as they were treated and the shift in perception is rather a structural result of China's rise and not of specific Chinese policy. Beyond the pure shift of power and influence over technical standardisation, China's growing footprint comes with the potential to reshape the existing technical standardisation order. It is the latter aspect that this paper focuses on.

Technical standardisation used to be an industry-driven domain. States set the overall framework, leaving the development of technical standards to voluntary – though extremely powerful – private self-regulation. China, for its part, traditionally follows an essentially state-directed – though not state-controlled – model of technical standardisation. The PRC's policy is undergoing some reconsideration and is still in the making, which leaves significant potential for European influence, not least because China remains interested in studying and learning from European experience.

At the same time, China's growing international footprint may turn technical standardisation from a field of technical cooperation into a tool of geopolitical conflict and a means to feed technological and economic dependencies. As long as technical standardisation was a subject of private self-regulation among corporations, the economic interest in interoperability prevailed. The more the field turns into a subject of competition between states over technological influence, the less technical standards are able to

**90** Gang Ding, "Indonesia on Track with China's Standards," Global Times, accessed: 2019-09-22, at: http://www.globaltimes.cn/content/1159064.shtml

serve their original purpose, and instead into a tool of power politics. China's state-directed approach to technical standardisation and its aim to make use of its state-permeated economy is contributing to this development. The PRC's international power has increased significantly, making it a potential role model for developing countries to study. Most crucially, not only are China's domestic standardisation efforts heavily influenced by the party-state's industrial policy and the character of the state-permeated economy, but China's international technical standardisation policies are too. Hence, China's policy and its increasing footprint in this field have the potential to reshape the future technical standardisation order, from one that is largely driven by private self-regulation to a more sovereignty-sensitive one that is shaped by nation states.

In short, the days when international technical standardisation was all about a cooperative search for technical solutions to the economic benefit of transnationally acting corporations, trade and technological innovation could be over. China is not the only actor responsible, but its state-directed approach is significantly fuelling a geopolitical turn to international technical standardisation.

## 6.2. Relevance of the development and consequences for the European Union

The developments described above lead to four main questions the EU should urgently address.

1. *Geopolitics rather than globalisation?*

The existing approach to technical standardisation has been a European-led system of private self-regulation aiming to provide interoperability based on the best innovation in order to facilitate the exchange of goods, services and data. In short, technical standardisation was an engine of globalisation facilitating economic cooperation. China's state-directed and strategic approach in particular fuels the tendency towards geo-economic rivalry over technology. It inherently undermines the cooperative approach seeking unitary technical standards and instead serves the strategic considerations of states to strive for spheres of political influence. Say the least, a state-directed approach to technical standardisation runs the risk of turning a field of cooperative facilitation of globalisation into one of political power struggles and geopolitics.
**If Europe wants to uphold its commitment to globalisation and a liberal regime facilitating global economic exchanges, it has to act.**

2. *Right of the mighty instead of rules-based institutional cooperation?*

To the extent that China (and other actors) strives to internationalise domestic technical standards outside existing international technical standardisation organisations, these institutions and their inherent normative rules-based framework are weakened. ISO, IEC, and 3GPP prescribe formal rules and informal routines of consensus-building based on a technology-driven exchange of arguments in which the most efficient innovation becomes most influential in standard-setting. As such, these institutions prescribe processes that shield technical standardisation from the projection of political power in search of the technologically most adequate solution.
**If Europe wants to protect the rules-based technical standardisation institutions, it needs to respond to the standardisation dimension of the BRI.**

3. *State control rather than trust in private self-regulation?*

The worldview underlying a state-driven approach to technical standardisation fundamentally contradicts Europe's aspiration to encourage societal self-coordination and cooperation. China's approach to technical standardisation goes far beyond setting a general framework in which a relationship of self-organisation and mutual trust flourishes. Instead, it follows the logic of state control.
**If Europe aims to stand against such a vision of political, economic and societal coexistence, it should take a clear stance in favour of a system that treats technical standardisation as an issue of private self-regulation.**

4. *The end of "Standard Power Europe"?*

Finally, Europe continues to have a strong influence on international technical standardisation. China's growing footprint necessarily comes at the cost of European power. To some extent, this is unavoidable.
**Since Europe's economic influence and success have disproportionally been the result of its ability to shape international norms and standards, including technical standards, it should not take its loss in influencing technical standard-setting lightly, but act.**

These four questions are not exclusively the result of China's growing footprint in technical standardisation. For example, a geopolitical dimension in technology competition is equally visible in the US. However, the PRC's state-directed approach to technical standardisation in general and the standards

dimension of the BRI in particular have certainly facilitated this development and require the European Union to act.

## 7. Policy recommendations for the European Union

Following on from the analysis, I recommend that Europe takes action in at least five fields. I spell out these five fields below and suggest concrete policies.

1. *Homework: Tackle the shortcomings of the European standardisation approach to be better prepared for a global competition with China (among others)*

- Three weaknesses of the European technical standardisation system are widely discussed. (a) European technical standardisation prioritises wide consultation and consensus-building. On the one hand, this is a strength of the European approach. On the other, it comes at the cost of a fast development of technical standards (24-36 months). (b) Due to a European Court of Justice ruling placing additional responsibilities on the EC, the publication of harmonised standards is very slow. (c) The European standardisation system does not allow for competition between standard-setting organisations, which might come at the cost of efficiency and quality of standards. It is beyond the scope of this paper to consider comprehensive reform of the European standardisation system. At the very least, more resources and desk officers at the EC are vital to address the second shortcoming. If Europe does not succeed in tackling these three issues, it will be very difficult to compete with the state-centric Chinese approach.

- More broadly, the more conducive the European regulatory system is for innovation, research and development as well as early commercialisation, the more likely Europe is to drive international technical standardisation. Hence, any general reform to sustain and improve European industrial innovation and industrial base, not least in strategic sectors of digitisation that will shape our future economies, will be essential. It is beyond the scope of this paper to discuss a concrete toolbox of measures, but the following issues should be considered: (a) Increased R&D funds strengthen technical expertise, which remains the cornerstone of influence in international technical standardisation; the EU should consider whether and how far to coordinate its R&D policy with the US. (b) Deregulation in priority sectors of strategic importance, particularly but not exclusively for SMEs and start-ups, helps to secure or regain first mover advantage, which is another factor that is crucial in achieving influence in international technical standardisation. (c) At the European level, economic integration should be deepened and the development of the Digital Single Market be prioritised in order to increase market size; market size has been proven to accelerate standard power. (d) Research into the effectiveness of international technical standardisation bodies has shown a positive correlation between large companies and (successful) contributions to technical standardisation. From this viewpoint, creating a level playing field for company mergers and acquisitions and a reform of European competition policy would be favourable to Europe. Ideally, this could be achieved in the context of the WTO or at least in free trade agreements (FTAs). However, from this angle, Europe might consider reviewing European competition law to allow mergers where they face the risk of global dominance of Chinese companies/SOEs.

- Some EU Member States already provide funds for SMEs to facilitate their participation in costly and highly decentralised processes of international technical standardisation, covering travel costs. The EU should set up an "EU Standards 2025 Fund" to be administered by CEN, CENELEC and ETSI for the same purpose. It could add some funding for further training for European SMEs that make these companies better equipped to influence international technical standardisation. This is to ensure regular contributions that are necessary to remain part of and retain influence in TCs and sub-bodies in existing international institutions. Europe should actively support companies striving for leadership/secretariat positions in existing institutions.

2. *Coordinate European policies, develop and constantly update a European Action Plan*

- European standardisation organisations (including its national members) and the European Commission's DG Grow have developed a remarkable degree of coordination, not least by means of the China Task Force of CEN and CENELEC. Since technical standardisation remains part of the remit of many different DGs in the European Commission, the European Commission should install a similar Task Force that works closely and coordinates with CEN, CENELEC and ETSI.

- In China, Europeans have successfully established the Seconded European Standardisation Export for China (SESEC). SESEC is jointly funded by the

European Commission, the European standardisation organisations and the European Free Trade Association (EFTA). SESEC is a success story and has significantly contributed to our knowledge of Chinese standardisation and the promotion of economic European interests in China. However, Europe lacks a counterpart to SESEC in Brussels that can help to coordinate the fragmented European standardisation policy vis-à-vis China and take an explicitly political-strategic approach. It could also help clarify the roles of the various institutions, discuss a reform of the European standardisation system, including a revision of the European Standardisation Regulation (and improve cooperation). Such a Brussels-based coordinator should be jointly funded by the EU (European Commission) and the three standardisation organisations, CEN, CENELEC and ETSI, to make sure that the coordinator engages with all relevant actors.

In addition, the EU should establish a high-level coordinator with significant political power, for example at the level of a Commissioner cabinet.[91]

- The EU should establish an annual standardisation summit that brings together not only standardisation agencies and companies, but also public policymakers from across the continent in order to speak with one voice. The High-level Conference on Standardisation in Bucharest in June 2019 is a positive step and should become a regular summit to be organised by the European Council Presidency in cooperation with the EC.

3. *Align with like-minded partners and raise awareness*

- All European institutions, the European Commission, the European Parliament and the EU Member States (individually and within the European Council) should advocate the technical approach to standardisation and be cautious when national interests and alliances are formed; consider naming and shaming where a "national strategy" is apparent, particularly to win third-country support.

- Raise awareness in third countries along the BRI: Europe needs to point out the technological, economic and political dependencies resulting from the bilateral adoption of domestic technical standards in its consultations with third countries, particularly along the BRI.

- Push the standards dimension of the EU-Asia Connectivity Communication: Europe needs to accelerate its Asian Connectivity initiative launched by the European Commission and allocate adequate funds to it in order to provide an attractive alternative to China's BRI. EU connectivity funds as well as European aid should be bound to the incorporation of international and European standards where they are available in order to support the global standardisation system.

- International and European technical standards should also be a major issue and condition for the EU in the conclusion of FTAs;

- Align with partners (e.g. Japan, Australia, India) in attempts to strengthen sustainability and good governance principles.

4. *Support Chinese technical standardisation reform and the integration of the PRC into the existing institutional framework*

- Reach out to SAC in order to coordinate how the European Commission and the European standardisation bodies can help to push the "China Standards 2035" agenda against vested Chinese interests.

- European standardisation organisations in cooperation with the European Commission should continue to organise seminars for Chinese actors involved in technical standardisation other than SAC (ministry officials, local governments, companies, standard-setting industry associations), sharing best practices of the European PPP.

- European standardisation organisations should help China integrate into the existing institutional framework and become an effective participant in order to prevent China aiming for an alternative institutional framework or strengthening its efforts outside the existing institutions. For example, CEN/CENELEC's China Task Force should actively support SAC in the preparation of a potential "Beijing Agreement" with ISO and IEC along the lines of the Vienna and Frankfurt Agreements. As a first step, CEN-CENELEC should sign a contract with SAC that formalises the dialogue on European assistance in formulating a "Beijing Agreement".

**91** For the same recommendation see also ETSI, Calling the Shots. *Standardization for EU Competitiveness in a Digital Era*, Sophia Antipolis, ETSI, 2019.

- In their exchanges with Chinese counterparts, European standardisation organisations and the European Commission should emphasise that the European system of harmonised standardisation allows for a limited state role (in contrast to the fully private US system) and that the European system has proven to be – by and large – more effective internationally.

- European standardisation organisations and the European Commission need to insist that technical standardisation is not an effective tool of state-driven industrial policymaking to improve product quality. The best standard is not the toughest, but it is in fact a minimum requirement that guarantees interoperability and creates consensus among all major stakeholders. Standards as minimum requirements are necessary to allow competition over quality among industry. If standards are too strict, such competition becomes impossible.

5. *Develop a mechanism of knowledge generation and information exchange over best practices in dealing with China's state-directed standardisation system*

- Establish a platform for European industry and technical standardisation experts across economic sectors to regularly exchange information on experiences with technical standardisation in China and best practices in tackling challenges for European companies. The platform could be launched as part of an annual summit as proposed above.

- The European Commission, the European standardisation organisations and EFTA should sustain the funding for the Seconded European Standardisation Expert in China and its team since it provides exceptionally valuable insights into China's complex technical standardisation system. More investment would be conducive to increasing Europe's knowledge base.

- In addition, EU Member States, the European Commission and the European Parliament should further invest in research into China's approach to technical standardisation in general and as part of the BRI in particular. Given the project-based approach of the latter, research on the BRI will need to be particularly extensive.

Europe continues to hold significant influence over international technical standardisation. However, the EU cannot take its strong position for granted, but urgently needs to act along the lines of these five fields if it does not want to become a bystander in times of a shifting standardisation order.

## LIST OF ABBREVIATIONS

| | |
|---|---|
| 3GPP | Third Generation Partnership Project |
| 3GPP2 | Third Generation Partnership Project 2 |
| 5G | Fifth Generation of wireless technology |
| AFNOR | Association française de normalisation (French standardisation body) |
| ANSI | American National Standards Institute |
| BRI | Belt and Road Initiative |
| BSI | British Standards Institution |
| CCP | Chinese Communist Party |
| CCSA | China Communications Standards Association |
| CEI | Comitato Elettrotecnico Italiano (Italian electronical standardisation body) |
| CEN | Comité européen de normalisation/European Committee for Standardisation |
| CENELEC | Comité européen de normalisation électrotechnique/European Committee for Electrotechnical Standardisation |
| DIN | Deutsches Institute für Normung (German standardisation body) |
| DKE | Deutsche Kommission Elektrotechnik, Elektronik, Informationstechnik in DIN und VDE (German electrotechnical standardisation body) |
| EC | European Commission |
| EFTA | European Free Trade Association |
| ETSI | European Telecommunications Standards Institute |
| EU | European Union |
| FRAND | Fair, reasonable and non-discriminatory terms |
| FTA | Free trade agreement |
| GB standards | Guóbiāo standards = Chinese national mandatory standards |
| GB/T standards | Guóbiāo tuījiàn standards = Chinese national voluntary standards |
| IEC | International Electrotechnical Commission |
| ISO | International Organisation for Standardisation |
| ITU | International Telecommunication Union |
| JISC | Japanese Industrial Standards Committee |
| KATS | Korean Agency for Technology and Standards |
| MIIT | Ministry of Industry and Information Technology |
| NDRC | National Development and Reform Commission |
| NGO | Non-governmental organisation |
| PPP | Public-private partnership |
| PRC | People's Republic of China |
| SAC | Standards Administration of China |
| SAMR | State Administration for Market Regulation |
| SC | Subcommittee |
| SEPs | Standard Essential Patents |
| SMEs | Small and medium enterprises |
| SOE | State-owned enterprise |
| TBT | Technical barrier to trade |
| TC | Technical Committee |
| TTIP | Transatlantic Trade and Investment Partnership |
| UNI | Ente Nazionale Italiano di Unificazione (Italian standardisation body) |
| US/USA | United States |
| WG | Working Group |
| WTO | World Trade Organisation |

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Note: In addition to the cited literature, this study is based on interviews with Chinese and non-Chinese technical standardisation experts, officials as well as think tank members and researchers investigating China's technical standardisation policy. This includes technicians participating in technical standardisation on behalf of Chinese and non-Chinese companies. The author conducted a total of 42 interviews in China and 65 interviews outside of China, mostly in Europe. Interview quotes are either transcripts from voice recordings or were reconstructed directly after the interview from a dense set of notes. To ensure anonymity only a rough indication of the interviewees' role is provided in footnotes.

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