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Report |The Geopolitics of Global Technology Standards: Key Issues and Solutions

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Acronyms

3GPP	3rd Generation Partnership Project
5G, 6G	Fifth/sixth generation cellular mobile phone technology
AI	Artificial Intelligence
ANEC	The European consumer voice in standardisation
BIS	Bureau of Industry and Security (part of Commerce Department, USA)
BSI	British Standards Institution
CAITEC	China Academy of International Trade and Economic Cooperation
CEPS	Centre for European Policy Studies
CET	critical and emerging technologies
COPOLCO	Consumer Policy Committee (of ISO)
CPIN	Consumer and Public Interest Network (of BSI)
CSIS	Center for Strategic and International Studies (USA)
DNM	digital neo-mercantilism
ESO	European standardization organization
GPAI	Global Partnership on AI
ICANN	Internet Corporation for Assigned Names and Numbers
ICT	information and communication technology
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IPR	Intellectual Property Rights
ISO	International Standardization Organization
ITU-R, ITU-T	International Telecommunication Union (Radio / Telecommunication)
JTC1	Joint Technical Committee (of IEC and ISO)
NIST	National Institute of Standards and Technology (USA)
NSTC	National Science and Technology Council (USA)
O-RAN, Open RAN	Open Radio Access Network
RCEP	Regional Comprehensive Economic Partnership
SME	Small and Medium Enterprises
SSO	standards setting organization
TTC	Trade and Technology Council (US-EU)
WTO	World Trade Organization

Introduction

International standards for the so-called critical and emerging digital technologies (CETs, such as 5G and AI) [3] have increasingly become a focus of geopolitical competition. While international standards are a tool for ensuring the interoperability and interconnectivity of products and services, reducing costs, and improving safety, they generally confer economic advantage to the technology-owning companies[4] and strategic advantage to countries where these companies are based.

In the last decade, especially in recent years, major global economies such as the US, China, and the EU, have all attached greater strategic importance to international standards-setting. Among them, China has stepped up its efforts since around 2015, when the government issued a strategic industrial plan[5] that encouraged Chinese companies and institutions to increase their participation in the process of international standards-setting. Since then, Chinese actors have greatly increased their engagement with Standards Setting Organisations (SSOs) in terms of active contributions, drafting of proposals, and leadership roles within SSOs.[6] This reflects China's ambition and aspiration to become an international standards-setter, rather than a follower. Similarly, the EU published a new *Strategy on Standardisation* in February 2022, aiming to promote EU's leadership in global standards, advancing its values and provide EU companies with a "first-mover" advantage. [7] The Strategy states that "Europe's competitiveness, technological sovereignty, ability to reduce dependencies and protection of EU values...will depend on how successful European actors are in standardisation at international level".[8] In the US, several proposed bills in the Congress are aimed at enhancing US leadership in global technology standards. For example, the Technology Standards Task Force Act of 2021[9] directs the government to establish a task force on setting emerging technology standards. Some US think tanks have also advocated that the US should renew its leadership in standards.[10]

[3] In the context of this report, the term CET arose from the United States' October 2020 National Strategy for CETs, which ended with a list of around 20 technologies in this category. A revised list was issued in February 2022 by the new White House team; it stresses ICTs and their applications in broad fields including engineering, manufacturing and energy.

[4] This is especially the case when a company holds the IPR for a widely needed standard.

[5] This Chinese industrial plan is often dubbed "Made in China 2025", as it set a series of goals for China's manufacturing sector by 2025.

[6] Sorina Teleanu (2021). *Report: The geopolitics of digital standards: China's role in standard-setting organisations.* https://www.diplomacy.edu/resource/report-the-geopolitics-of-digital-standards-chinas-role-in-standard-setting-organisations/

[7] European Commission (2022). *New approach to enable global leadership of EU standards promoting values and a resilient, green and digital Single Market.* https://ec.europa.eu/commission/presscorner/detail/en/ip_22_661

[8] European Commission (2022). *An EU Strategy on Standardisation: Setting global standards in support of a resilient, green and digital EU single market* (p.1). https://ec.europa.eu/docsroom/documents/48598.

[9] https://www.congress.gov/bill/117th-congress/senate-bill/1498

[10] Walter G. Copan and Kirti Gupta (2022). *Renewing US leadership in standards*. https://www.csis.org/analysis/renewing-us-leadership-standards

While it is expected that countries will vie for more say or control in international standards-setting, a notable development is that the EU and the US have been repeatedly emphasizing collaboration and coordination among "like-minded" partners regarding the standardisation of CETs. Such collaboration has already been witnessed in the frameworks of the G7[11] and the EU-US Trade and Technology Council (TTC). The TTC has a dedicated working group on technology standards, which is tasked to develop approaches for coordination and cooperation in CET standards, including AI.[12] These new developments raise a series of questions:

- *What are the key issues or causes behind the current geopolitical tensions around the standardisation of CETs?*

- *Should democratic values, or any values, be incorporated in international standards-setting?*

- *Will the EU, the US, and other "like-minded countries" (such as South Korea and Japan) work outside the existing international standardisation framework regarding the CETs? What are the consequences if this does happen—not only for international standards-setting, but also for the "rest of the world", especially consumers, and people from the Global South?*

- *How much room is there for cooperation between the West and China regarding technology standardisation, given that some CETs such as Artificial Intelligence (AI) do involve national security and ethical concerns? What are possible solutions to international cooperation around CET standardisation?*

In September 2022, the Oxford Global Society organised a webinar,[13] inviting some of the leading policy analysts and industry experts from major standards-setting countries/regions to discuss the key issues of the current geopolitical tensions around, and possible solutions to, international standards-setting for CETs. This report derives, to a large extent, from the webinar expert discussion (referred to as "expert discussion" below).[14] In preparing for the report, we also drew on a wide range of research and literature and exchanged views with other policy analysts and industry experts.

[11] Ministerial Declaration, G7 Digital and Technology Ministers' Meeting (28 April 2021). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/981567/G7_Digital_and_Technology_Ministerial_Declaration.pdf

[12] European Commission (2021). *EU-US Trade and Technology Council Inaugural Joint Statement.* https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_21_4951

[13] The webinar was chaired by Prof. Robin Mansell (Professor of New Media and the Internet at LSE). Speakers included: Prof. Milton Mueller (Professor at the Georgia Institute of Technology), Mr Thomas Li (President of Industry Standardisation at Huawei), Prof. Andrea Renda (Senior Research Fellow at CEPS), Dr Scott Kennedy (Senior adviser and Trustee Chair in Chinese Business and Economics at CSIS), Dr June Park (Fung Global Fellow at Princeton University), Dr Baisheng An (Associate Fellow at CAITEC, China Commerce Ministry), and Ms Claire Milne MBE (senior visiting Fellow at LSE).

[14] A video recording of the webinar is available here: https://www.youtube.com/watch?v=eWdJs8wF4cM&t=5s and an edited transcript of the expert discussion is available here: https://oxgs.org/wp-content/uploads/2022/11/GMT20220912-edited-transcript.pdf

Based on the above sources, we have identified two major causes behind the geopolitical tensions around international standards-setting: **the spill-over effect of US-China rivalry** and the trend of **trying to incorporate democratic values in standards**, especially in AI and other sensitive technologies. In this report, we will first examine each of the causes, discussing whether it is possible to go beyond the US-China rivalry and to separate values from technical standards. This will be followed by discussing how a multi-stakeholder standardisation framework may help to offset the impact of the geopolitical tensions on global standards-setting and the "rest of the world". In the conclusion, we will provide some policy recommendations on how to strengthen international cooperation around CET standards-setting and to avoid a forking or splintering digital ecosystem.

The spill-over effect of US-China rivalry

As Milton Mueller, professor at the Georgia Institute of Technology (US), observes, the geopolitical tension around global standards of CETs comes from a major shift in policy that he termed "digital neo-mercantilism" (DNM), which is chiefly driven by the US-China rivalry.[15] The term DNM means adopting national policies that abandon the globalized, market-driven digital ecosystem, instead trying to subordinate technology to national political and security ends.[16] While the US-China rivalry has led to widespread concerns about possible technology decoupling between the West and China, our focus here is to assess the spill-over effect of this rivalry on the international standardisation of CETs, which relies on international cooperation.

CET: A term designed to extend American tech control?

In this report, we use "CETs" to describe digital technologies that are the focus of national industry policies and/or standards strategies. The technologies of most current salience in this context are 5G/6G and AI – all receiving much attention in SSOs. It is worth noting that we do not consider "CETs" the best term but we use it because it is widely circulated in this context (and a new term may cause unnecessary confusion).

For Mueller, the term "CET" itself is a labelling ploy designed to expand the US government's control over technology exports and foreign investment.[17] He points out that as the CET list compiled by the US National Science and Technology Council (NSTC) covers almost any and every ICT (such as AI, 5G, cloud computing, and quantum computing), it gives the government and the prevailing China hawks "a blank check" to interfere in any situation that they fear might give rise to competitors in foreign markets. Also, there is no accepted definition of an "emerging technology" and there may never be, as emerging technologies cannot be easily identified until they have been deployed; and some technologies listed by the NSTC as CETs, such as undersea cables, are mature technologies. This approach, in turn, as Mueller argues, reflects US "paranoia" about losing its leadership position to China in technology areas designated as CETs.

[15] See expert discussion.
[16] Milton Mueller and Farhat Karim (2022). *Regulation of platform market access by the United States and China: Neo-mercantilism in digital services*. Policy & Internet 14:348–367.
[17] See expert discussion.

This "paranoia" on the part of Washington is echoed by Dr Scott Kennedy, Senior Adviser and Trustee Chair in Chinese Business and Economics at the Center for Strategic and International Studies (CSIS) of the US. As Kennedy observes, competition over international standards used to centre on economic interests (in his words, "the main contest was about rents"), but the current US-China rivalry has changed the situation, as other interests including national security are being squeezed in.[18] He notes that this situation is partly because the USA lacks "self-confidence" in technology competition and thus has "overshot" in its policy response to international standardisation—that is, advocating cooperation among "like-minded countries". As Kennedy points out, in the West, the term "like-minded countries" has become a synonym for countries that practi:e democracy and respect rule of law, and its intention is to exclude China or authoritarian countries in general from certain activities (including standard-setting).[19] However, both Kennedy and Mueller argue that China is not an innocent victim, since the DNM is practiced by both sides (in the case of China, this is witnessed in its techno-nationalistic policies in data and other digital areas).[20]

China: a challenger or a contributor?

It is ironic that until the rise of US-China rivalry, US policymakers and industry had encouraged China's participation in international standards-setting rather than developing its own standards that would restrict the market access of American companies. Currently, China's participation in international standards-setting has been increasingly viewed in the West through the lens of competition for global technology leadership. As a result, China has often been framed as a "challenger" to existing international standards-setting frameworks in much of the English-language literature.[21]

This "challenger" role was strongly disputed by Thomas Li, President of Standardisation at Huawei. He argues that China is a great "contributor" to the international standards-setting organisations. Taking Huawei as an example, the company had submitted more than 5000 contributions annually to international SSOs as of 10 years ago.[22] Yinbing Ke, a Chinese expert on the Belt and Road Initiative (BRI) and Chinese companies' overseas expansion, commented that Chinese companies, encouraged by their government, have greatly increased their participation in international standards organisations *in line with the rules* of these organisations. He also noted that, despite the mounting attention focused on China's role in international SSOs, China still has a relatively small share in terms of approved international standards that are proposed by Chinese actors.[23] A Chinese media report said in 2020 that

[18] See expert discussion.
[19] Ibid.
[20] Ibid.
[21] See, for example, Chatham House (2019). *US–China Strategic Competition: The Quest for Global Technological Leadership*. https://policycommons.net/artifacts/613540/uschina-strategic-competition/1593307/
[22] See expert discussion. Thomas Li further confirms to us that Huawei's current contributions to international SSOs are much greater than 5000 per year, but he does not have an accurate number.
[23] Source: our primary interview with Yinbing Ke.

only 0.7% of ISO standards, for example, were proposed by China, while 95% were proposed by developed countries.[24]

Some Western analysts seem to be sympathetic to the above arguments. Carl Cargill, an American industry expert who formerly led the standards departments at Sun Microsystems and Adobe, provides a historical perspective on why China is framed as a "challenger" in the West. As he observes, the current international standardisation system was designed after WWII for an industrial society, in which participation was difficult except for a few large companies and countries (i.e., the G7); nations who came later to the party (especially China) are handicapped by this standardization regime.[25] At a US House hearing in March 2022, Haley Stevens, Research and Technology Subcommittee Chair, distinguished between fair and unfair influence in standards-setting and commented that the ambitious goals of both the EU and China regarding supremacy in international standards-setting are "legitimate" as long as they continue to adhere to the "merit-based" model for standards development.[26] Sorina Teleanu from Diplo Foundation provided a balanced observation. On the one hand, China's growing involvement in international standards-setting means more competition to established standards setting powers. There are concerns that China is trying to shape the current international standards environment to one that is more state-driven and to promote some surveillance technologies like facial recognition via international standardisation, which may pose challenges to democratic values. On the other hand, China's participation is also a "win" for global standardisation processes, as it can have positive consequences for global interoperability and the safety of products and services, as well as reduce cross-border market barriers.[27]

Separating standards participation from export control?

The spill-over effect is particularly linked to the American administrations' policy of adding many Chinese technology companies to the Entity List (companies on the list are subject to American export control) administered by the Commerce Department's Bureau of Industry and Security (BIS). As of March 2022, a total of 532 Chinese companies had been added to the Entity List, up from 130 in 2018.[28] Due to fear of violating the BIS's export control rules, it is claimed that many American companies withdrew from international SSOs in recent years. As Alissa Cooper, Cisco Systems Chief Technology Officer, told the above-mentioned House hearing, she witnessed this counterproductive consequence first-hand as a standards leader

[24] Global Times (2020). *Chinese standards going global an unavoidable trend*. https://www.globaltimes.cn/content/1187060.shtml.
[25] Carl Cargill (2022). *Behind the geopolitical conflicts around global technology standards.* https://oxgs.org/2022/10/20/behind-the-geopolitical-conflicts-around-global-technology-standards/
[26] American Institute of Physics (2022). *Science Committee Rejects 'Heavy-Handed' Strategies for International Technical Standards*. https://www.aip.org/fyi/2022/science-committee-rejects-%E2%80%98heavy-handed%E2%80%99-strategies-international-technical-standards
[27] Sorina Teleanu (2021). *Report: The geopolitics of digital standards: China's role in standard-setting organisations.* https://www.diplomacy.edu/resource/report-the-geopolitics-of-digital-standards-chinas-role-in-standard-setting-organisations/
[28] Vivek Mishra (2022). *The great US-China tech decoupling*. https://www.orfonline.org/expert-speak/the-great-us-china-tech-decoupling/

and participant.[29] Such disruption regarding participation in international standards-setting has also been witnessed with companies from other countries. For example, in September 2021, Finland's Nokia announced it would suspend its participation in the O-RAN Alliance after some Chinese member companies were added to the Entity List, to avoid the risk of contravening US law; but after the Alliance made changes to its participation documents and procedures to address the concerns, Nokia resumed its participation.[30]

In the current geopolitical environment, there are some positive signs of international cooperation on technology standardisation. As Kennedy observes, pushed back by the American and European industry and other stakeholders, the US seems to have separated export control from participation in international SSOs.[31] In September 2022, the BIS issued an interim final rule to authorise the release of *certain* technology and software (i.e., relatively low-level technologies) in the context of standards setting and development in standards organisations.[32] This cleared the confusion and worries of American companies (and other countries' as well) about whether they would need to obtain BIS licences to participate in international standardisation activities that include parties on the Entity List. Of course, the motivation of the BIS was not to facilitate international cooperation on CET standards, but to ensure "US companies fully participate and lead in standards development" while continuing to prevent advanced technology transfer (as in the words of American officials).[33]

Incorporating values in standards: Leading to a forking framework?[34]

Another main reason behind the current geopolitical conflicts over standards is the trend of trying to incorporate values in technical standards, driven by geopolitical interests or other concerns. This has led to concerns that the existing international standardisation system may be crumbling, and forking may be taking place in the system.

Incorporating values in standards-setting

Based on the definitions or descriptions of international standards from international SSOs including the IEC and ISO, international standards reflect the global *consensus* and distilled wisdom of many thousands of technical experts delegated by their countries,[35] and they can be understood as "a formula that describes *the best way* of doing something" at a given

[29] American Institute of Physics (2022). *Science Committee Rejects 'Heavy-Handed' Strategies for International Technical Standards*. https://www.aip.org/fyi/2022/science-committee-rejects-%E2%80%98heavy-handed%E2%80%99-strategies-international-technical-standards

[30] Chris Coughlan (20 September 2021). *Nokia has recommenced participation in the O-RAN Alliance*. https://itwire.com/your-it-news/5g/nokia-has-recommenced-participation-in-the-o-ran-alliance.html

[31] See expert discussion.

[32] NIST (2022). *Commerce Levels Playing Field to Support US Stakeholder Participation in International Standards Setting Activities*. https://www.nist.gov/news-events/news/2022/09/commerce-levels-playing-field-support-us-stakeholder-participation

[33] Ibid.

[34] It is worth noting that in this context, different words with similar but not identical meanings, like "incorporating", "embedding" and "embodying", have been used in policymaking and research circles. We chose to use "incorporate" (or" incorporating"), as the word was used in the EU's Standards Strategy document (p.4).

[35] IEC. *What is an international standard*. https://www.iec.ch/understanding-standards

time.[36] Thus, international standards can be seen as a public good, and the process of international standardisation is based on at least two basic principles: ***consensus-based*** and ***merit-based*** (as illustrated in the words "the best way"). In addition, principles like inclusiveness, openness and transparency have also been emphasized by almost all international standardisation organizations, including the WTO.[37] Taken together, these widely agreed principles, reflecting desires for fairness and meaningful communication, are fundamental for international cooperation on standards-setting.

However, when discussing the relations between values and standards, the above principles may not be conceived as "values" by all participants. In this report, "values" mainly refers to democratic values and human rights protection, and in particular the subset of these that prove troublesome in the context of setting standards. While many democratic values and human rights, such as equality and justice, may be understood universally, some values, like freedom of speech, are typically associated with democracies. The attempt to incorporate democratic values into standards-setting is frequently witnessed in the official documents of the US and the EU. For example, the Joint Statement of US-EU TTC, released in May 2022, stated that the US and the EU intended to strengthen their cooperation in areas including CET standards "*in line with democratic values and protection of human rights*".[38] In addition, the EU's Strategy on Standardization states, "more than ever, standards do not only have to deal with technical components, but also incorporate *core EU democratic values* and interests, as well as green and social principles".[39]

The attempt to incorporate democratic values in standards has raised concerns that the US and EU may develop their own standards, along with "like-minded countries", outside the current international standardisation framework led by international SSOs. As Professor Andrea Renda, Senior Research Fellow at the Centre for European Policy Studies (CEPS), notes, the Global Partnership on AI (GPAI) is not global, but "rather a G7 expression".[40] GPAI was launched in 2020 and currently has 25 members. It aims to "promote responsible AI use that respects human rights and democratic values".[41] Similarly, the *Declaration for the Future of the Internet,*[42] mainly put forward by the EU and the US, has so far been endorsed by 60 partners. Using Renda's words, that is "far from being a global statement or even a global project".[43]

While the above initiatives associate technologies with democratic values, this does not necessarily mean the US and the EU are discarding international SSOs. It seems to us that the primary intention of the EU and the US collaboration and coordination regarding technology

[36] ISO. *Standards.* https://www.iso.org/standards.html
[37] WTO. *Principles for the Development of International Standards, Guides and Recommendations.* https://www.wto.org/english/tratop_e/tbt_e/principles_standards_tbt_e.htm
[38] US Commerce Department (2022). *U.S.-EU Joint Statement of the Trade and Technology Council.* https://www.commerce.gov/sites/default/files/2022-05/US-EU-Joint-Statement-Trade-Technology-Council.pdf. P2.
[39] European Commission (2022). *An EU Strategy on Standardisation: Setting global standards in support of a resilient, green and digital EU single market.* https://ec.europa.eu/docsroom/documents/48598, P.4.
[40] See expert discussion.
[41] OECD. *The Global Partnership on AI*. https://oecd.ai/en/gpai
[42] https://ec.europa.eu/commission/presscorner/detail/en/IP_22_2695
[43] See expert discussion.

standards is to foster the development of aligned and interoperable technical standards between them, and "together leverage those at the international level" (as stated in the above-mentioned EU-US joint statement).[44] This may have already become a reality. For example, as Dr June Park, a Fung Global Fellow at Princeton University, observes, in the O-RAN Alliance, "like-minded countries" seem to work well with each other.[45]

Can/should values be separated from standards?

The attempt to incorporate democratic values in technical standards and the emphasis on standardisation cooperation among "like-minded countries" are very disruptive developments, warned Thomas Li. He noted, ironically, that standardisation is exactly the process of seeking consensus among "non-like-minded" actors. If we emphasize incorporating democratic values and human rights protection within international standards, it would be a disaster, he suggested, as it would be almost impossible to reach consensus among different parties.[46] This may be so given that human rights can be a highly politicized issue.

For Thomas Li, the current international framework for standardisation of CETs has been working well "unless someone wants to break it".[47] Indeed, for the specific technologies under discussion, even if not for all CETs on the list, there is no shortage of international bodies bringing together those concerned with setting international standards. Among them, ISO, IEC and ITU primarily work through national standards organizations and/or national governments; while IEEE and 3GPP are primarily industry-led.[48] It is worth noting that at JTC1 (the Joint Technical Committee of IEC and ISO), many international standards for advanced and new technologies are being developed, including AI, Digital Twins, augmented reality, virtual reality, quantum computing, Internet of Things, and biometrics.[49]

As for how to separate democratic (or otherwise controversial) values from standards, the solution prescribed by Thomas Li is to differentiate technical standards from industry policies or regulations - that is, letting standards focus on the technical components, while using policies or regulations to deal with the value-related requirements.[50] Using privacy protection as an example, Li argues, under many circumstances, it is better to leave data protection to national policies or regulations, rather than to codify it into technical standards for products or services. This is because countries have different criteria for personal data protection (even the US and the EU have not reached a detailed agreement on cross-border data transfer due

[44] European Commission (2022). *EU-US Joint Statement of the Trade and Technology Council.* https://www.consilium.europa.eu/media/56726/eu-u-s-joint-statement-of-the-trade-and-technology-council.pdf

[45] See expert discussion.

[46] Ibid.

[47] Ibid.

[48] For more information about the international governance of standardization, see Baisheng An (2012). *The Global Governance of Standardization: The Challenges of Convergence*. Working paper #32, Research Center for Chinese Politics and Business, Indiana University. https://dashi.163.com/html/cloud-attachment-download/?key=djAyVVhUQ0pKOVJNckw5L3pacXVGcjBlZz09

[49] Antoinette Price (2021). *IEC and ISO broaden scope of international standards for innovative information technologies*. https://etech.iec.ch/issue/2021-04/iec-and-iso-broaden-scope-of-international-standards-for-innovative-information-technologies

[50] See expert discussion.

to their different approaches to data protection), so it is almost impossible, he argued, to reach consensus on personal data protection if it is included in technical standards.

However, Professor Renda doubts this approach is always possible or ideal. As he observes, the more technology becomes pervasive and dual-use (used for both civil and military purposes), the more standards start incorporating *social-technical* information. For example, IEEE has been working on AI's human-centric design that ends up incorporating values, since human centricity involves some fundamental human rights.[51] In addition, as Renda notes, there is increasingly a convergence between standardization and regulation, especially in the case of AI.[52] Currently, the European Commission's proposal for a regulatory framework for AI (i.e., the Artificial Intelligence Act) contains dedicated requirements for AI trustworthiness and risk management, which will be supported by harmonized standards developed by European Standardization Organizations (ESOs).[53] Likewise, the policy document *AI Risk Management Framework*, administered by the National Institute of Standards and Technology (NIST) of the US Department of Commerce, serves as a de-facto voluntary standard for American stakeholders in designing and using AI systems.[54]

Thomas Li's approach to differentiating international standards from national/regional regulations by seeking to decouple the technical components from the social-technical values, needs to be considered in the light of the observation that values may be *inherent* in some technologies like AI. This calls for innovative approaches in the standardization of these technologies. It is widely known that AI systems can "amplify, perpetuate, or exacerbate inequitable outcomes…[and] may exhibit emergent properties or lead to unintended consequences for individuals and communities."[55] Thus, it may be necessary to include certain values such as *non-discrimination*, *environment protection*, and *human empowerment* (which are not unique to democracies) into the international standards specifying trustworthy or responsible AI.

In addition, as Scott Kennedy observes, national security is another important and values based dimension that is difficult to dissociate when developing international standards for some critical technologies (such as 5G/6G).[56] While we argue that standardization can be used to alleviate national security concerns, how to build trust towards technology providers coming from "non-like-minded countries" is certainly a big challenge (as shown in the West's treatment of Huawei 5G equipment).

A forking standardisation framework?

The geopolitical tensions around CET standardisation and the social-technical dimension of technologies that gives rise to value-based discussions are leading to concerns that the

[51] Ibid.
[52] Ibid.
[53] US Commerce Department (2022). *U.S.-EU Joint Statement of the Trade and Technology Council.* https://www.commerce.gov/sites/default/files/2022-05/US-EU-Joint-Statement-Trade-Technology-Council.pdf. p.9.
[54] NIST. *AI risk management framework*. https://www.nist.gov/itl/ai-risk-management-framework
[55] NIST (2022). AI Risk management framework: Second Draft.
https://www.nist.gov/system/files/documents/2022/08/18/AI_RMF_2nd_draft.pdf
[56] See expert discussion.

existing international standardisation system may be crumbling, especially in relation to AI standards. As Professor Renda observes, the forking of CET standardisation is happening at least to some extent, and we are increasingly seeing several technology stacks that are said to incorporate different values. This is visible in the Chinese "Digital Silk Road" initiative and the integrated approach to standards among "like-minded countries", which then compete against each other in the global market.[57] For instance, the EU Standardisation Strategy document states that "it is necessary to *promote and facilitate the adoption of European and international standards*" by neighbouring countries and other important partner regions like Africa or Latin America and the Caribbean.[58] Dr June Park also notes, if this forking trend goes further, the rest of the world, especially the Global South, will have to compare the attractiveness of Western products with Chinese ones, and their choices will be influenced by both politics and cost.[59]

For Professor Renda, the best possible outcome that could occur in the context of the above-mentioned competing technology stacks is a "Y-shaped" technology stack. This "Y-shaped" stack means that the lower layers are treated as being more technical or infrastructural, and are shared in the global community, while the higher layers are more closely linked to policy and values, which gives rise to a greater potential for forking.[60] While being pessimistic about a future unified CET standardisation framework, Professor Renda acknowledges that a forking system is far from ideal and there is "a lot more to lose than to gain from it".[61] Professor Milton Mueller also opposes a forking standardisation system based on values.[62] He and his colleagues have published papers examining in depth how values relate to standards, refuting the idea that values or rights can be "embedded" in standards, with useful examples and case studies.[63]

Towards a multi-stakeholder standardisation framework?

The above-discussed dual challenges—the US-China rivalry and the efforts to incorporate democratic values in standards—can have important consequences for the international standardisation of CETs. One response is to emphasize the importance of a multi-stakeholder standardisation framework for CETs, as bringing economic and societal interests more to the fore could help to offer routes to international consensus even in the light of the national security and geopolitical interests which impact on the current situation. By "multi-stakeholder", we mean not only the current major players such as major technological powers,

[57] Ibid.
[58] European Commission (2022). *An EU Strategy on Standardisation: Setting global standards in support of a resilient, green and digital EU single market*. https://ec.europa.eu/docsroom/documents/48598, p.7.
[59] See expert discussion.
[60] Ibid.
[61] Ibid.
[62] Ibid.
[63] Milton L. Mueller and Farzaneh Badiei (2019). *Requiem for a dream: on advancing human rights via internet architecture*. Policy & Internet, 11.1, 61-83.
Colin J. Kiernan and Milton L. Mueller (2021). *Standardizing Security: Surveillance, Human Rights, and the Battle Over Tls 1.3*. Journal of Information Policy, 11 (1), 1-25.
https://scholar.google.com/citations?view_op=view_citation&hl=en&user=aZWVdAUAAAAJ&sortby=pubdate&citation_for_view=aZWVdAUAAAAJ:hwlm9Y4obscC

big tech companies from a few countries, but also small businesses, consumers, civil society and academics around the world.

While international standards organisations are generally open in principle to all types of stakeholders and emphasize principles like consensus and inclusiveness, the reality is that many smaller and less economically developed countries lack the competence and resources to join in technical standards discussions. This situation is especially so when it comes to the standardisation of CETs. As Thomas Li from Huawei observes, there is little by way of systematic difference in the way CETs are handled by SSOs as compared to other technologies, though, in general, CET standards may emerge faster, be more innovative and have greater influence. In addition to the hurdle of technology competence, civil society actors may have limited funding for participation.

The EU's Strategy on Standardisation acknowledges the "uneven and untransparent representation of industrial interests",[64] and both the US and the EU have advocated broadening participation in standards development for CETs by involving more stakeholders, including SMEs, civil society actors, and consumer representatives.[65] However, the multi-stakeholder system that the US and EU envision is mostly limited to domestic non-governmental organizations or "like-minded" partners. Also, while the European Commission does promise to fund some standardisation projects in selected African countries, this is linked to "promot[ing] key European standards in partner countries".[66]

Despite these challenges regarding a multi-stakeholder standardization framework, there are some positive aspects. First, our expert discussion highlighted the potential for both the US and China to modify their behaviour in relation to international standards-setting, without harming (indeed, potentially in due course benefitting) their essential national interests. As mentioned above, the US Commerce Department has issued a new rule separating export controls from participation in international standardization, and there is room for more adjustment of their position. It is worth noting that, as Professor Mueller observes, the Chinese companies mainly targeted by the US, such as Huawei and TikTok, are often successful commercial companies, which may make them unlikely "Trojan horses" for the Chinese state. China, likewise, is already moving towards opening its national standards organizations to participants from outside China.[67] For some years, it has also been reforming its standardization system, among other things, by giving a greater role to industry and driving the adoption of international standards by domestic companies.[68]

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[64] European Commission (2022). *An EU Strategy on Standardisation: Setting global standards in support of a resilient, green and digital EU single market*. https://ec.europa.eu/docsroom/documents/48598, p.4.
[65] See for example, European Commission (2022). *EU-US Joint Statement of the Trade and Technology Council.* https://www.consilium.europa.eu/media/56726/eu-u-s-joint-statement-of-the-trade-and-technology-council.pdf
[66] European Commission (2022). *An EU Strategy on Standardisation: Setting global standards in support of a resilient, green and digital EU single market*. https://ec.europa.eu/docsroom/documents/48598, p.7.
[67] See for example Article 7 on Standards-Setting of Section III on Regulatory Framework of the draft EU-China Bilateral Investment Treaty, https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/china/eu-china-agreement/eu-china-agreement-principle_en (consulted 07/10/2022).
[68] See Yang, You-hong, Ping Gao, and Haimei Zhou (2022). *Understanding the evolution of China's standardization policy system*. Telecommunications Policy: https://doi.org/10.1016/j.telpol.2022.102478

As regards the Global South, India has already led in some standards-related circles, as noted by Dr Baisheng An, Associate Fellow at the China Academy of International Trade and Economic Cooperation (CAITEC),[69] and may do so in the future. In addition, the recently signed Regional Comprehensive Economic Partnership Agreement,[70]which involves China, developed economies like Japan and South Korea and many Global South countries, has a full chapter on standards, stressing a cooperative approach. This suggests that the requirements regarding standardization from the Global South will feed into future markets, and insights from this region now can help those requirements to be met in more timely and efficient ways.

Integrating a broader range of stakeholder viewpoints into standards-setting processes would be worthwhile. Wider participation should help in identifying features of technologies that are not initially obvious, or which may be deliberately hidden, but which could lead to undesirable outcomes for some groups. Ways to reduce potential harm may then be incorporated in a draft standard, or (if hard to agree) may be handled separately. As Philip Wennblom, chairman of JTC1, notes, "The more diverse the participation and perspectives, the better the quality of the standards we develop". [71] There has been some active participation by consumer organisations. For example, the British consumer network for standards, BSI/CPIN, is in close touch with its European counterparts through ANEC, other countries' consumer representatives through ISO's consumer policy committee COPOLCO, and broader consumer representation through Consumers International. It is worth noting that Consumers International has organizational members from more than 100 countries, many of which are in the Global South, with several Chinese entities in the membership. It may be that a small business in China will have more in common with its counterpart in Europe than it has with a large business in China.

Conclusion and policy recommendations

International standards for CETs will play an increasingly crucial role in the adoption and regulation of these technologies. Given the ubiquitous nature of many of these technologies, the stakes regarding international standards are higher than ever. The current geopolitical tensions around technology standards are mostly driven by the US-China rivalry and the West's emphasis on cooperation among "like-minded" partners. There are, however, some legitimate value- or security-related concerns regarding the standardisation of certain critical and sensitive technologies, such as AI and 5G. The current international standardisation framework is far from an equal and inclusive system, with the interests of small businesses and consumers/citizens, especially those from the Global South, being severely underrepresented.

Another useful reference is: commentary by Matt Sheehan at https://carnegieendowment.org/2021/10/28/three-takeaways-from-china-s-new-standards-strategy-pub-85678 and presentation by Betty Xu of SESEC at https://www.austrian-standards.at/bilder/innovation/ENS-Event/Pr%C3%A4sentationen/Betty%20Xu%20-%20SESEC.pdf

[69] See expert discussion.

[70] The text is available at https://rcepsec.org/legal-text/.

[71] Antoinette Price (2021). *IEC and ISO broaden scope of international standards for innovative information technologies*. https://etech.iec.ch/issue/2021-04/iec-and-iso-broaden-scope-of-international-standards-for-innovative-information-technologies

To facilitate effective dialogue on standards among all stakeholders, a shared understanding of terminology serves as a useful start and could make a big difference to the quality of discussion. Participants in standardisation may use different terms to mean the same thing; or use the same term without a common understanding of its meaning. As an example, in discussions of "trustworthy AI", often neither "trustworthy" nor "AI" are well defined, which can render the compound term obscure. In our view, loose definitions can be accidental, but they are sometimes deliberate so as to achieve the appearance of a greater likelihood of consensus than actually exists, or to achieve political ends (as in the case of "CETs").

Based on the discussion above, we make policy recommendations in three areas: (1) how to go beyond the geopolitical tensions when it comes to international standardization of CETs; (2) how to incorporate values in, or decouple values from, standards; (3) how to build a multi-stakeholder framework for standardization of CETs.

First, all participants should aim to reduce the trend towards politicizing technical standards, given that a merit-based, rules-based standardization system is beneficial to all. Non-cooperation in technology standards will create huge barriers to international trade and may eventually lead to de-facto technology decoupling between the West and its allies, on the one hand, and China and those choosing to use non-Western standards, on the other.

The West should welcome, as it once did, "non-like-minded countries" like China that have the technology capability to contribute to international standards organizations. As Professor Mueller observes, technological innovation happens when innovators acquire capital to try out new ideas in markets, which are inexorably global, and China is a big part of that market and a major outlet for US capital. At the same time, China needs to be more open and less techno-nationalistic, even as what the US is doing seems to be encouraging it to become more closed and more self-reliant. From an economic standpoint, future incentives are needed for keeping the standardization world united and cohesive, rather than bifurcated or splintered. The risk of a potential loss of the markets of "non-like-minded countries" and large Global South markets may provide a partial incentive. Of course, export controls may also incentivise domestic production of technologies that are no longer available to their importers.[72]

In our view, it is positive and important progress that the US government seems to have separated export control from participation in international standards-setting activities. We hope this will facilitate a normalization of international cooperation around technology standards. This also highlights the important role of the private sector in relation to the geopolitical tensions, as the sector could help to convince the global superpowers to continue technology cooperation (as argued by Professor Renda).[73]

Second, we deem it disruptive to attempt to incorporate democratic values or human rights protection (which often have political meanings) into technical standards where their presence would obstruct progress, as disagreements between countries regarding these values would render the traditional consensus- and merit-based standardization system

[72] See for example: Jeffrey Ding. China AI Newsletter: Chinese Reactions to the Nvidia and AMD Chip Ban. https://chinai.substack.com/p/chinai-196-chinese-reactions-to-the (Nvidia and AMD Chip Ban).
[73] See expert discussion.

ineffective. In our view, some widely shared principles and values, such as non-discrimination and environmental protection, for example, could be incorporated in certain technical standards, with wording open to negotiation.

Regarding values, we acknowledge that it is difficult to know in advance when technical standard setting will bring values into prominence - values that may not be shared by all participants. However, in the process of reaching consensus, these differences will come to the forefront when a line must be drawn so that a standard can be finalized on a consensus basis within a useful timescale. Steps beyond that line, both in further specification and in implementation guidance, may be taken **at regional or national levels as government policies or regulations to deal with differences**. We propose maximum transparency and sharing of relevant thinking in support of continuing mutual influence and eventual identification of and convergence on good practice. Within a draft standard, consensus may be extended by providing a limited set of options for implementation. Statements of conformity with the standard could then usefully include identification of which option(s) has been chosen.

Third, we suggest that a truly multi-stakeholder framework may offer promise for international cooperation regarding international standardization of CETs. The authors of this paper support the suggestion of Sorina Teleanu to reframe the challenge, away from our initial focus on tensions between the US and China, and towards "maintain[ing] the overall integrity of the standardization framework", so that no single actor can manipulate the system, and standards have the best possible chances of wide take-up. [74] As Teleanu says, this would entail both broadening participation in standards development organizations and allocating more resources to standardization work. Specifically, we propose:

- In all interested countries, national standards bodies and processes should take account of the needs and views of groups that are currently under-represented. This would both enrich national standards discussions and build a good base of competence for the same groups to participate in international standards work.

- Examining how some international bodies achieve broad participation, including representatives of the Global South, civil society, consumers and small businesses, and considering how similar practices could be brought about in standardization organizations. ICANN, with its dedicated spaces for at-large and civil society participation, could be a good starting point.

- Providing existing entities that are potential participants in international standardization activities with the training and funding that they need to become participants. Funding should be raised multilaterally and allocated via an agreed mechanism that would ensure fairness and give recipients independence.

[74] Sorina Teleanu (2021). *Report: The geopolitics of digital standards: China's role in standard-setting organisations.* https://www.diplomacy.edu/resource/report-the-geopolitics-of-digital-standards-chinas-role-in-standard-setting-organisations/