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Exclusive interview

ISO Standards: Powering a safer, smarter and more sustainable world

Interview with ISO President Dr. Sung Hwan Cho

ISO主席曹诚焕：ISO标准让世界变得更安全、更智慧、更可持续

Spotlight

Report on Standardization Achievements of the 10th Anniversary of the BRI released

《“一带一路”10周年标准化成果报告》发布

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For more information

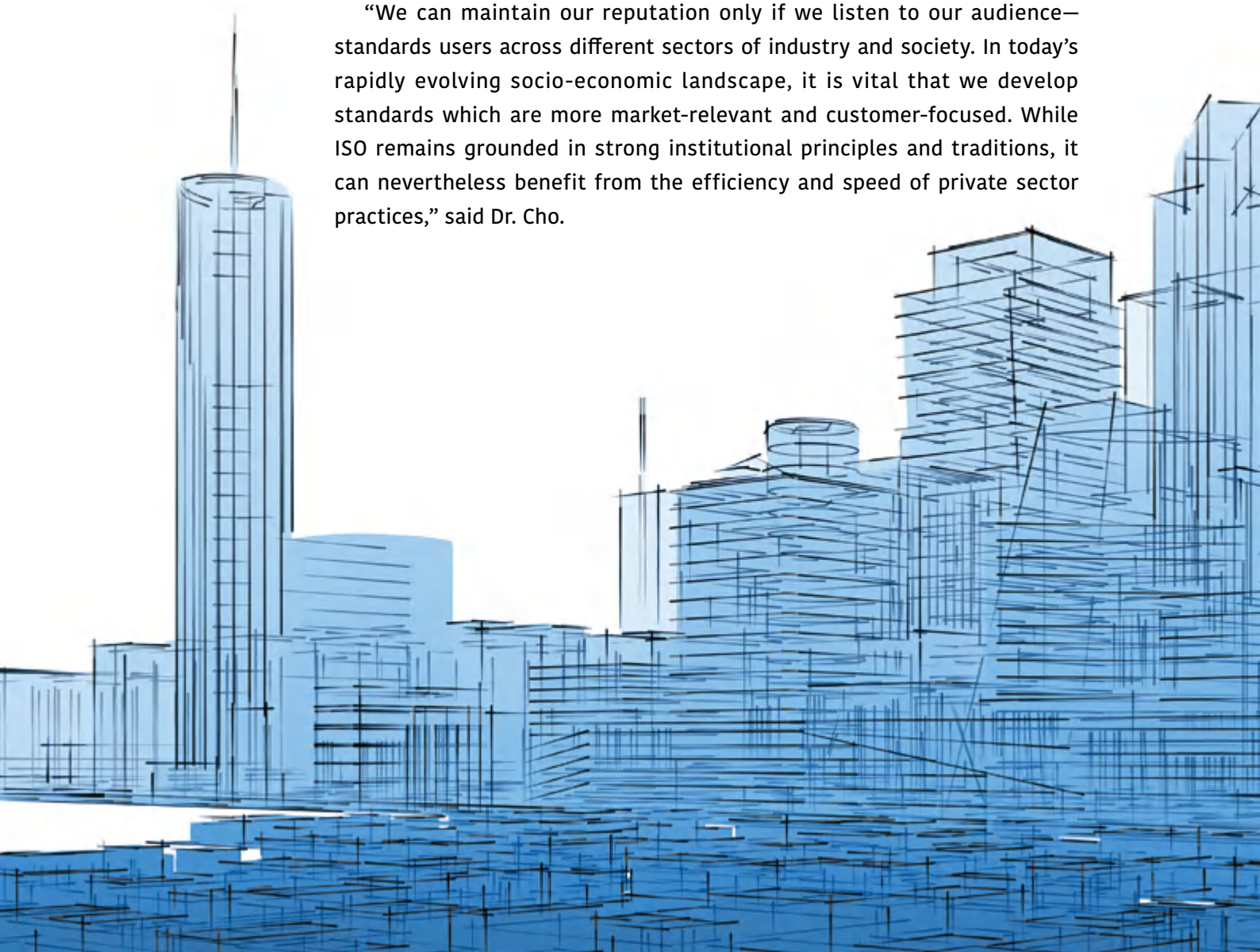
The voluntary national standard
GB/T 29772-2024, *General requirements of electric vehicle battery swap station*,
has taken effect since July 1, 2025.

The implementation of the standard is expected to help electric vehicle battery swap stations to adapt to diversified needs and vehicle models, promoting the industry's orderly and healthy development.

Towards a smarter, better future

We are honored to have ISO President Dr. Sung Hwan Cho join us for an interview. In the EXCLUSIVE INTERVIEW column, Dr. Cho expounds his insights on the crucial role and importance of international standards, the progresses and achievements made by ISO in advancing priorities, and how ISO is adapting to emerging technologies such as artificial intelligence. He also discusses ISO's initiative in the digitalization of standards, his perspectives on future trends of international standardization, efforts to engage experts from SMEs, and his suggestions for future collaboration between SAC and ISO.

"We can maintain our reputation only if we listen to our audience—standards users across different sectors of industry and society. In today's rapidly evolving socio-economic landscape, it is vital that we develop standards which are more market-relevant and customer-focused. While ISO remains grounded in strong institutional principles and traditions, it can nevertheless benefit from the efficiency and speed of private sector practices," said Dr. Cho.

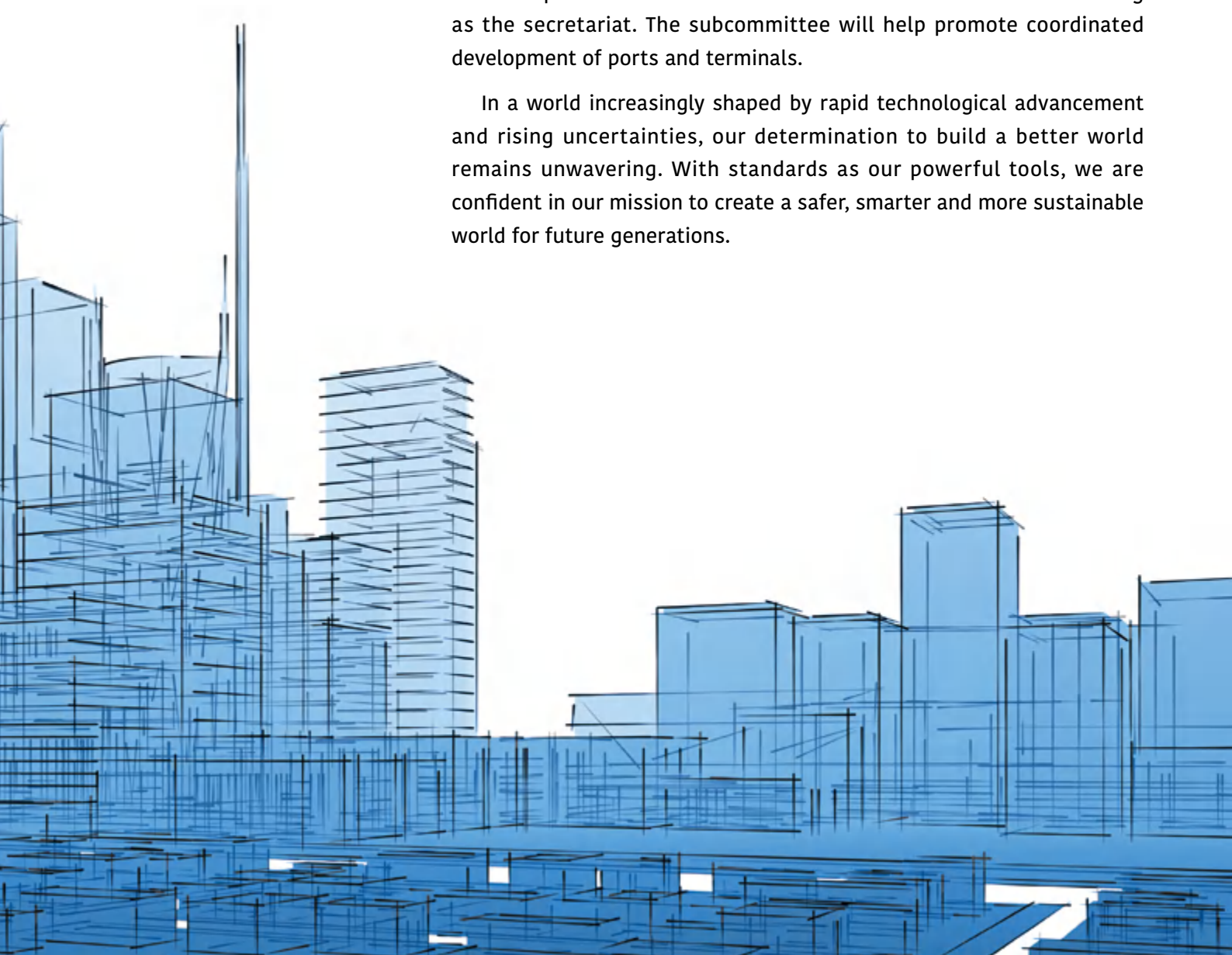


Dr. Cho also commends SAC's significant contribution to ISO's governance and technical activities its consistent participation and engagement. "SAC's collaboration and drive are vital in helping achieve ISO's vision of making people's lives easier, safer and better."

In the SPOTLIGHT column, we feature the *Report on Standardization Achievements of the 10th Anniversary of the Belt and Road Initiative (BRI)* released by SAMR and SAC at the end of last year. The report reviews the achievements of the past decade in using standardization to promote policy, infrastructure, trade, financial, and people-to-people connectivity since the launch of the BRI.

Recently, two ISO international standards on tourism, exhibitions and events have been published with substantial contributions from Chinese experts. These standards are expected to promote the healthy, orderly development of the tourism industry. Additionally, ISO/TC 8/SC 27 on ports and terminals has been established with China serving as the secretariat. The subcommittee will help promote coordinated development of ports and terminals.

In a world increasingly shaped by rapid technological advancement and rising uncertainties, our determination to build a better world remains unwavering. With standards as our powerful tools, we are confident in our mission to create a safer, smarter and more sustainable world for future generations.



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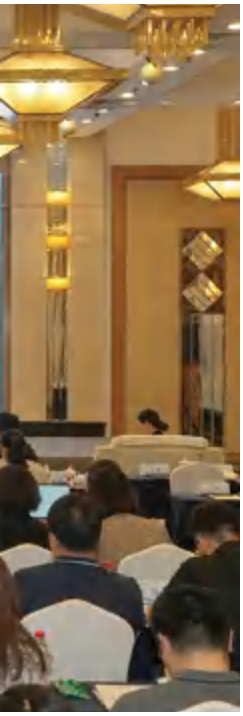


China strives for carbon neutrality through energy labels

The China National Institute of Standardization (CNIS) held the Academic Meeting on 20th Anniversary of China Energy Label in Beijing on June 27. The event took place during the 35th National Energy Conservation Publicity Week, which ran from June 23 to 29.

Approximately 200 representatives from relevant government departments, research institutions, industry organizations, and enterprises attended the meeting. Officers from the National Development and Reform Commission, the Ministry of Commerce, and the State Administration for Market Regulation (SAMR), as well as CNIS President Luo Fangping attended and addressed the meeting.

Representatives from research institutions and enterprises discussed the current status of energy conservation and policy development. They reviewed the implementation of the energy labeling system, and shared the latest advancements in energy-saving technologies, standards and product labeling domestically and internationally.

At the meeting, CNIS released the *Report on 20 Years of China Energy Labeling Program*. According to the report, the energy leabeling system has made significant achievements in supporting policies, leading technological upgrades, improving energy efficiency, facilitating green consumption, and contributing to energy conservation and carbon reduction. The system now covers 45 product categories, with over 26,000 registered enterprises, and more than 4 million registered product models. It has cumulatively saved more than 4.28 trillion kilowatt-hours of electricity. The China Energy Label is now one of the world's most widely implemented energy labeling systems, boasting the largest market scale and most notable energy-saving effect.

A new version of the China Energy Label online platform was also launched at the event. Additionally, CNIS and leading enterprises jointly launched an initiative to make a commitment to better implementing the system. CNIS will continue to improve the efficiency and effectiveness of the labeling system, supporting China's goals of achieving carbon peak and neutrality, and advancing the green transformation of the economy and society.

SAMR releases four national standards for exhibition services

Recently, SAMR issued four national standards in the exhibition services sector, including the newly developed GB/T 45704-2025, *Guidelines for online exhibition services*, and three revised standards.

GB/T 45704-2025 addresses the emerging online exhibition models. It provides guidelines for the whole exhibition process, and clarifies the requirements for service providers' capabilities, to promote the healthy development of this evolving industry.

GB/T 30521-2025, *Statistical rules for trade exhibition*, and GB/T 31082-2025, *Specification for exhibition data auditing*, refine the statistical criteria, data sources and review methods for exhibitions. The two standards add 15 new statistical indicators such as utilization rate of exhibition venues and green exhibition area, and revise 8 existing indicators including the number of exhibition groups and visitors. Together, they offer a more comprehensive and accurate picture of China's exhibition economy.

GB/T 33490-2025, *Basic requirements for exhibition construction service*, enhances the technical requirements and service criteria for the construction process of exhibition booths, and adds requirements concerning environmental protection and sustainable development. It is of great significance for improving the quality and safety of exhibition projects.

To date, China has issued and implemented 20 national standards in the exhibition industry, forming a complete standards system covering the entire exhibition industry chain, ranging from event organization, venue operation to support services. These standards have been widely applied in major exhibitions such as the China International Import Expo and the China Import and Export Fair, supporting the industry's green, digital, international, and brand-oriented development.

SAC/TC 7 launches working group on intelligent system ergonomics design and evaluation

The working group on design and evaluation of intelligent system ergonomics, under SAC/TC 7, *Ergonomics*, was officially established in Qingdao city, Shandong province on June 18.

The launching ceremony was jointly organized by the Sub-institute of Fundamental Standardization of CNIS and China Standard Certification Co., Ltd. It was attended by more than 60 experts and industry representatives in fields such as smart home technology, intelligent driving, wearable devices, medical health, and nuclear engineering.

The meeting was presided over by Zhang Xin, Secretary General of SAC/TC 7, and addressed by Zhang Xin, General Manager of China Standard Science and Technology Group Co., Ltd. Zhao Chaoyi, Chair of SAC/TC 7, officially announced the establishment of the working group. The working group's positioning, scope of work, and short-term plan were clearly defined at the meeting.

Keynote speeches at the meeting focused on the international standardization development trend of intelligent system ergonomics, the status of relevant national standards under development, the role of ergonomics in the field of smart home appliances, standardization requirements of ergonomics of intelligent operating system, as well as characteristics and specific requirements of intelligent medical devices for human factors engineering. The attendees also discussed topics such as the direction of standards development for intelligent system ergonomics and key technical indicators.

The working group aims to apply the research results of ergonomics to the standardization of intelligent systems, and enhance the safety, comfort and efficiency of intelligent systems through multidisciplinary cooperation. It will focus on developing and revising standards for ergonomics design and evaluation in applications such as smart home appliances, wearable devices, medical care, intelligent cockpits, and robotics.

Standardization supports integrated regional development

In 2020, Shanghai and the provinces of Jiangsu, Zhejiang, and Anhui jointly issued the *Specification for electronic certificate sharing and application*, the first local standard in the field of government affairs in the Yangtze River Delta region.

The release and implementation of this standard have promoted the connectivity in government services, data and technological integration, accelerating the region's coordinated and innovative development.

The standard stipulates the process, scope, interfaces, application scenarios, and other technical requirements for cross-provincial sharing of electronic certificates in the region. It ensures the secure and controllable cross-provincial sharing process, and the lawful and compliant use of electronic certificates, improving the integrity, accuracy, and timeliness of certificate data.

For example, residents of Shanghai, Jiangsu, Zhejiang and Anhui can use the regional government services apps to present electronic certificates instead of physical ones. Nine types of electronic certificates issued by administrative departments, which include driving licenses, vehicle registration certificates, and road transport operation licenses, are now recognized for cross-regional law enforcement in transportation and traffic management. In total, 40 frequently used electronic certificates have been recognized across the Yangtze River Delta region.

As of now, Jiangsu, Zhejiang, and Anhui have accessed certificates from Shanghai for over 2.64 million times, while Shanghai has accessed certificates from the three provinces for more than 3.97 million times. The specification has significantly enhanced data circulation, and improved government service capabilities for residents and businesses.

CNIS and GS1 China boost China-Africa cooperation

The fourth China-Africa Economic and Trade Expo was held in Changsha, Hunan province on June 12-15. Themed "China and Africa: Together Toward Modernization", the expo was designed to further facilitate the China-Africa ties in the field of trade and economy.

To implement the achievement of the 2018 Beijing Summit of the Forum on China-Africa Cooperation (FOCAC), the *FOCAC Beijing Action Plan (2025-2027)*, China National Institute of Standardization (CNIS) and GS1 China attended the expo and set up booths as vital participants of the plan on China-Africa quality enhancement of the State Administration for Market Regulation (SAMR).

Through the booths, CNIS and GS1 China introduced the efforts to construct the China-Africa Center for Standardization Cooperation and Research as well as the platform for digital mutual trust verification for China-Africa trade. They demonstrated the important role of standardization and item coding technology in promoting the China-Africa trade and economy as well as the industrial upgrading in Africa.

In terms of China-Africa standardization cooperation, CNIS introduced its latest research and the construction progress and phased achievements of the China-Africa Center for Standardization Cooperation and Research, and collected the technical demands of standardization from Chinese companies in Africa. CNIS experts gave keynote speeches on the China-Africa cooperation in enhancing the quality of products and services, and facilitating the connectivity of quality infrastructure.

In terms of building mutual trust by item coding, GS1 China offered on-site presentation and case sharing to communicate with exhibitors and visitors at home and abroad. Based on item coding, the platform for digital mutual trust verification for China-Africa trade has established the digital recognition rules for products to smooth the way for the mutual recognition of product identification, trustworthy data and unhindered circulation between China and Africa. It will benefit the trade of quality products, crack down on counterfeit and shoddy products, and safeguard the rights and interests of Chinese and African enterprises.

By attending the expo, CNIS and GS1 China expanded the international influence of SAMR's plan on China-Africa quality enhancement, and drew a new picture of promoting the industrial upgrading with standards and coding and empowering the high-quality development of China-Africa cooperation.

Two ISO standards of refrigerant compressors released

Two international standards, ISO 18501:2025, *Performance rating of positive displacement refrigerant compressor*, and ISO 18483:2025, *Performance rating of centrifugal refrigerant compressor*, were released at an event held by GREE and Hefei General Machinery Research Institute Co., Ltd. in Zhuhai, South China's Guangdong province on June 12.

The two new standards have filled the gap of the performance evaluation of the two compressors. Compressors are the core component of refrigerant equipment, and the large-scale application of compressors with high energy consumption has brought great pressure on the reduction of carbon emissions. The standards have provided a scientific solution for the energy efficiency evaluation of refrigerant compressors around the world, promoting the industrial development towards standardization and high efficiency.

CNIS experts win ISO Excellence Award

The ISO Central Secretariat and the ISO/TC 314, *Ageing societies*, awarded Hou Fei, Cao Lili, and Wang Qi from CNIS for their contributions to ISO 25556:2025, *Ageing societies—General requirements and guidelines for ageing-inclusive digital economy*.

This is the first time for experts in the field of ageing societies to win the award. The three experts contributed to balancing technological innovation and humanistic care, bridging the age gap in the digital era, and making a breakthrough in the global digital equity process in the context of ageing population with their diverse perspectives, expertise and practical actions.

The award is a recognition of the professional capabilities of CNIS experts and China's standardization work in this field. Taking this as an opportunity, CNIS will continue to make efforts to conduct research on international standardization for ageing societies, and contribute more Chinese wisdom to the development of global ageing affairs.

IEC releases 3 technical documents for electrical energy storage

In the process of building a new power system dominated by new energy sources, power storage is a key supporting technology that ensures the safe and stable operation of the power grid, enables the flexible regulation of the system, and raises the level of new energy consumption. It is also key to achieving carbon peak and neutrality as well as energy transformation.

Three technical documents in the field of electrical energy storage were released recently, the development of which was led by China. They are IEC TS 62933-2-3:2025, *Electric Energy Storage (EES) Systems—Part 2-3: Unit parameters and testing methods—Performance assessment test during site operation*, IEC TR 62933-3-200:2025, *Electrical energy storage (EES) systems—Part 3-200: Planning and performance assessment of electrical energy storage systems—Design principles of electrochemical based EES systems*, and IEC 62933-4-2:2025, *Electric energy storage (EES) systems—Part 4-2: Guidance on environmental issues—Assessment of the environmental impact of battery failure in an electrochemical based storage system*.

The documents fully consider the demands of EES system application, and specify the parameters and testing methods to assess the performance of EES systems, methods to evaluate the negative impact on the environment caused by battery system failure, and engineering cases and design requirements of electrochemical EES systems.

They will become a vital basis of product R&D, engineering design and system operation for global manufacturers, users and third-party bodies. They will further promote the technology, standardization and product quality of China's EES industry, which are of great significance in enhancing the industrial strength in global markets.

Sino-Germany standardization cooperation starts a new chapter

The unveiling ceremony of Sino-Germany Standardization Cooperation Innovation Center in Frankfurt was held on June 23. It was attended by more than 30 representatives from DKE and China's Taicang and Suzhou government departments, which marks a firm step in promoting the institutional opening up of standards and deepening cultural exchanges and mutual learning.

As the extension of the Sino-Germany Standardization Cooperation Innovation Center in Suzhou, the Innovation Center in Frankfurt will focuses on exchanges of standardization policies, research on standards system, development of international standards, and cultivation of international standardization talent. Its core mission is to work with German standards bodies such as DIN and DKE, to serve the sharing of standards information between China and Germany, promote the coordination of technical regulations, and empower the bilateral economic and trade cooperation by standards.

Wang Xiangyuan, Secretary of Taicang Municipal Party Committee, highlighted the cooperation with Germany for over 30 years. More than 550 German enterprises have located in Taicang, catalyzing the industries such as high-end manufacturing, and creating a good environment for standardization development. Also, German enterprises have participated in the development of Chinese standards, and contributed to international standards through joint efforts with Chinese counterparts. The Innovation Center in Frankfurt is expected to strengthen the bilateral standardization cooperation and achieve more results.

Florian Spiteller, Head of External Relations & Support Department of DKE, addressed that this cooperation is a key step to standards internationalization. International electrotechnical standards are the engine to boost green and sustainable transformation, which facilitate global technological and cultural communication, and assist enterprises in expanding the market, making safe and reliable products, and benefiting the society. DKE will strive to achieve carbon neutrality and digital connectivity, promote the cooperation with Taicang and local enterprises to develop excellent standards, and realize the all-electric and connected society.

ISO Standards: Powering a safer, smarter and more sustainable world

Interview with ISO President
Dr. Sung Hwan Cho

ISO标准让世界变得更安全、更智慧、更可持续

——专访ISO主席 曹诚焕博士

***China Standardization*: Thank you for accepting our interview. With over 30 years of experience in the automotive industry, you have held roles ranging from research engineer to top executive, including President and CEO of Hyundai Mobis—the world's sixth-largest auto parts supplier. Based on your extensive industry background, how do you perceive the role and importance of international standards? How has this experience shaped your approach and priorities as ISO President?**

Dr. Sung Hwan Cho: I have been very fortunate in my professional career to witness first-hand the extraordinary power of standards and their incredible potential to transform lives for the better. International Standards, though often unheralded and invisible, are critical for trade, exports and cross-border commerce. They offer an entry point to global markets, helping to establish trust and confidence in goods and services and ultimately driving social and economic growth.

In a time of growing regulatory fragmentation, International Standards provide a common language and a consistent framework that is recognized worldwide, enabling technical interoperability across borders. This is particularly relevant for the global automotive industry, which must comply with various regulations and local certification requirements in a wide range of target markets.

Safety and quality are top priorities in automotive development. Meeting minimum quality thresholds requires adherence to established standards, such as those developed by ISO, and regulatory frameworks. The name of ISO commands trust and respect across the globe due to our consensus-based, multi-stakeholder standards development process, which gives traders and consumers alike confidence in the quality and safety of products.

However, we can maintain our reputation only if we listen to our audience – standards users across different sectors of industry and society. In today's rapidly evolving socio-economic landscape, it is vital that we develop standards which are more market-relevant and customer-focused. While ISO remains grounded in strong institutional principles and traditions, it can nevertheless benefit from the efficiency and speed of private sector practices.

With technology advancing at an unprecedented pace, it is essential that ISO adopts more agile and responsive standardization models to better serve the market. Emphasis should be placed on timeliness, market needs, customer orientation, environmental, social and governance (ESG) considerations and target-driven delivery.

To stay relevant and continue driving quality, safety and innovation, we must embrace flexibility and actively listen to our end users. By adapting to their needs and remaining open to change, we can ensure that our standards continue to meet the highest expectations and foster global progress.

At the start of your tenure as ISO President, you outlined five key pillars of action that you intended to focus on during your presidency. Now that more than a year has passed, what progress or notable achievements have been made in advancing these priorities?

The past year has seen many notable milestones for ISO in relation to these pillars. These include the creation of a mechanism to respond to global crises, the increased use of digital learning solutions in delivering ISO capacity-building activities and expanded opportunities for developing countries to participate in our standards development system. Development support for emerging economies has also been boosted, aided by the backing of ISO's partners, such as the Global Environmental Facility (GEF), the National Metrology Institute of Germany (PTB) and the Swedish International Development Cooperation Agency (Sida), and some ISO members, including KATS, ISO's member for the Republic of Korea.

We have made significant strides in raising ISO's profile and strengthening its presence on the global stage. ISO leadership has participated in panels, discussions and workshops at events as diverse as the World Economic Forum in Davos, the AI for Good Global Summit in Geneva and the Paris 2024 Olympic Games.

ISO's voice was heard at COP29 in Baku, Azerbaijan, where we co-hosted the first-ever Standards Pavilion, a vibrant hub showcasing how standards play a crucial role in turning climate commitments into measurable actions. Recently, our Secretary-General, Sergio Mujica, joined World Trade Organization (WTO) Director General Dr. Ngozi Okonjo-Iwaela to highlight the key role of International Standards in global trade during the WTO's 30th anniversary celebrations.

However, we cannot achieve success alone. Fostering strategic partnerships – central to our Strategy 2030 – allows us to share expertise and break down silos to create harmonization and alignment across the standards ecosystem. This was demonstrated last year by our partnership with the United Nations Development Programme (UNDP), which resulted in the *ISO/UNDP Guidelines for the SDGs*. Launched at the ISO Annual Meeting in September, the guidelines were jointly developed to accelerate progress towards achieving the UN Sustainable Development Goals.

Working with such a globally recognized strategic partner as UNDP ensures that sustainability efforts are harmonized, transparent and impactful.

These collaborative efforts will culminate in December when, alongside our World Standards Cooperation partners, the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU), ISO will lead the groundbreaking 2025 International AI Standards Summit in Seoul. This initiative responds to the UN's call to enhance AI governance through International Standards, following the adoption of the Global Digital Compact last year. Given China's recent leaps forward in AI development, SAC's participation will be particularly significant.

With the rapid rise of technologies like artificial intelligence, how is ISO adapting to support and guide these developments through standardization? Could you share some of the recent advancements ISO has made in the digitalization of standards?

With governments worldwide adopting different approaches to AI governance and regulation, there is an urgent need for global benchmarks to ensure security and interoperability across markets. International Standards developed by the ISO/IEC technical community on AI can fill this gap. These trusted tools help businesses and policymakers establish responsible, ethical AI governance in line with good business conduct.

Standards such as our flagship ISO/IEC 42001 support AI governance by providing guidance on the responsible management and implementation of AI systems within organizations. By focusing on interoperability, transparency and safety, International Standards create a universal language around AI that promotes trust.

Last year, the world took a historic step towards global governance of digital technology and AI with the launch of the UN's Global Digital Compact. The Compact underscores the need for increased collaboration between standards development organizations to promote the development and adoption of interoperable AI standards that uphold safety, reliability, sustainability and human rights. ISO fully supports this initiative and is working with our fellow standards development organizations IEC and ITU, our members, regional standards bodies and other strategic partners to advance it.

In addition to developing standards on AI, we are also embracing the technology to improve our systems and revolutionize the standards development process.

The Online Standards Development (OSD) platform, a joint endeavour with our partner IEC, is designed to support the creation of standards online and drive the digital evolution of our two organizations. With the recent publication of the first standard completely developed using the tool – encompassing the authoring, commenting and editing stages – the OSD is now the default platform for the development of ISO standards.

One of my own proposals, the new ISO Companion project, is designed for the ISO technical community to address their questions around standards development through an AI-powered chat-like experience. With a pilot programme currently underway, the ultimate goal is to apply AI across ISO's entire value chain, increasing efficiency and delivering measurable value in the coming years.

The delivery of the tool in just 3 months shows that ISO/CS is at the forefront of AI transformation – not only in our standards but also in developing innovative, fast and efficient products to serve our members' needs.

From your perspective, what are the key trends shaping the future of international standardization? How should ISO prepare to address emerging global challenges?

The effects of climate change, energy shortages and loss of biodiversity affect us all. Addressing these global challenges requires urgent and meaningful collaboration, innovation and an international approach.

ISO, through the standards we develop, has a crucial role to play in steering the world towards a better future. We have demonstrated that we can be agile and responsive to market needs, for example by developing guidelines for organizations on implementing ESG practices and contributing to the UN Sustainable Development Goals.

The landscape of International Standards is rapidly evolving, with several recent advancements that hold significant promise for enhancing sustainability, innovation and inclusivity. The creation of ISO and IEC's Joint Technical Committee on Quantum Technologies underscores our dedication to

exploring emerging technologies. We are shaping the future of the digital age through our work in bio-digital convergence and the metaverse, and have recently established a new subcommittee on brain–computer interfaces.

Meanwhile, the first standards from ISO's technical committee on the circular economy are helping all types of organizations maximize their contribution to sustainable development. ISO has also teamed up with our WSC partners, IEC and ITU, in the AI and Multimedia Authenticity Standards Collaboration, launched last year to develop global standards for AI watermarking, multimedia authenticity and deepfake detection technologies. This initiative aims to address the serious challenges posed by the rapid advancements in AI and generative AI technologies.

ISO will be helping to shape the agenda on AI at two prominent standards-related AI events in the coming months: standards day at AI for Good in Geneva in July and the 2025 International AI Standards Summit in December.

Encouraging broader participation in standardization efforts is crucial. What steps has ISO taken to involve experts from small and medium-sized enterprises (SMEs), as well as young professionals, in the development of international standards?

At ISO, we believe in actively listening to all voices to ensure that our standards meet global needs. We are committed to advancing inclusivity and diversity within the ISO system. Our consensus-based standards development process, which includes a wide range of stakeholders from all sectors, ensures that all opinions are considered – regardless of age or background.

SMEs account for the vast majority of businesses worldwide but often face unique challenges due to limited funds or resources. ISO recognizes this and has produced guidance specifically aimed at supporting SME involvement in standards development.

Input from the younger generation, a powerful driver of innovation in China, is also crucial. Engaging young professionals in standards development brings three key benefits: new perspectives, ideas and skillsets for the technical community; continuity in technical committees; and increased diversity within the ISO community, giving young people a presence in fields traditionally dominated by older generations.

However, it is not enough to simply talk about this involvement – research suggests that many young people are unfamiliar with standards and standardization in general. This raises questions over how the next generation of technical experts will engage with the standards development process. ISO and its members are making every effort to actively involve and empower young professionals, establishing programmes to raise their awareness of standards.

These include a dedicated project to support our members in attracting, engaging and retaining young professionals in the standards development process. In addition, ISO annually awards a grant to a postgraduate student or team to conduct research related to evaluating the impacts of International Standards, based on a specific theme.

Finally, ISO's Next Generation Award, sponsored by former ISO President, Dr. Zhang Xiaogang from China, celebrates and encourages the development of promising young professionals who promote sustainable development. These awardees bring enthusiasm, creativity and fresh ideas to the standardization industry.

Through these initiatives, we aim to create an environment in which young people can thrive, driving the standards system towards a more sustainable, inclusive and resilient future.

You have participated in several important meetings and events hosted by China over the past two years. How do you assess China's role and contributions to ISO's international standardization work? What suggestions do you have for enhancing collaboration between ISO and the National Standardization Administration of China (SAC) in the future?

It has been a great privilege for me to visit China as ISO President on several occasions and meet colleagues from SAC to discuss their crucial role in the development of International Standards. China is a leader in international standards development and a valued member of the ISO family. SAC heads around 90 ISO technical committees, dealing with important topics such as plastics, shipping and marine technology, and education and learning services. Overall, it participates in around 780 technical committees and sub-committees across various sectors, including ores and metals, chemicals and distribution of goods.

I welcome and encourage SAC's increased participation in ISO technical activities, especially those linked to China's strategic priorities for economic and social development. International Standards, as powerful enablers of trade, are crucial in facilitating China's participation in regional and international markets. SAC's contribution to their development is therefore extremely important in the national context.

On a global scale, SAC can play a vital role in developing standards that address current environmental and sustainability challenges, such as renewable energy, greenhouse gas emissions and the circular economy. SAC also has the expertise to shape transformative technologies and the digital transformation by contributing to standards on AI, quantum technologies and cybersecurity.

The input of Chinese experts and stakeholders from across all sectors helps ensure that ISO standards meet market needs and reflect diverse user experiences, fostering buy-in and trust across borders. The relationship between our two organizations is mutually beneficial.

SAC also makes notable contributions to the governance and technical activities of our organization through membership of the ISO Council and the Technical Management Board (TMB). Its continued participation and engagement are essential in shaping ISO's strategic direction.

Finally, I applaud SAC's efforts towards implementing the ISO Strategy 2030, through active participation in international standardization activities, research into the benefits of standards, enforcing standard copyright protection and promoting capacity building. SAC's collaboration and drive are vital in helping achieve ISO's vision of making people's lives easier, safer and better.

Interviewed by Cao Xinxin (Diana) 采访/曹欣欣

About Sung Hwan Cho

Sung Hwan Cho has been elected ISO President for a two-year term starting from January 1, 2024 and served as President-elect in 2023. Dr. Cho brings 30 years of experience from the automotive industry as top executive and research engineer. As the Advisor of Hyundai Mobis, he previously held the position of President and CEO for the company, which is the 6th largest auto parts supplier of the world.

Prior to taking up his role as President and CEO of Hyundai Mobis, he served as Deputy R&D head, Executive Vice President of R&D Planning and Coordination and President of Hyundai America Technical Center with Hyundai Motor Company. He also was the CEO of Hyundai Autron, an automotive semiconductor and software affiliate of Hyundai Motor Group.

Dr. Cho has accumulated extensive expertise in technology and related standards through his previous roles such as engineering manager. He also serves as Chairman of the Korea Automated Vehicle Standardization Forum and Council Board member in the Korean Standards Committee. He is also an elected member of the prestigious National Academy of Engineering of Korea, and holds the position of Endowed-Chair Professor at Sogang University, Seoul, Republic of Korea.

Dr. Cho holds a Ph.D in Mechanical Engineering from Stanford University, CA, USA and has a bachelor's and master's degree from Seoul National University, Seoul, Republic of Korea.

Report on Standardization Achievements of the 10th Anniversary of the BRI released

《“一带一路”10周年标准化成果报告》发布

In December 2024, SAMR (SAC) released the *Report on Standardization Achievements of the 10th Anniversary of the Belt and Road Initiative (BRI)*, which summarizes the fruitful results of standardization since the BRI was proposed in 2013.

The report provides reference for better leveraging the fundamental role of standards and promoting the high-quality Belt and Road cooperation. The main content of the report is hereinafter presented.

Preface

Standards, as the common language of the world, play a vital role in accelerating global connectivity. In promoting the BRI construction, standards and regulations complement each other, jointly forming a solid foundation for enhanced connectivity.

Taking the implementation of the *Action Plan on Belt and Road Standard Connectivity* as the central focus, SAMR (SAC) has comprehensively reviewed the achievements of the past decade in using standardization to promote policy, infrastructure, trade, financial and people-to-people connectivity since the BRI was proposed, so as to provide reference for further exerting the basic role of standardization in pushing forward the BRI.

Over the past decade, cooperation and innovation have been sustained to promote standards connectivity along the Belt and Road, yielding fruitful results. In total, 54 cooperation agreements have been signed by SAC and 43 national standardization bodies of BRI countries to deepen standardization cooperation and communication. More than 450 standards have been mutually recognized by SAC and the national standardization bodies of Russia, Kazakhstan, Mongolia and other countries. Also, the Standard Information Platform Contributed by the Belt and Road Countries (**https://www.ydylstandards.org.cn**) has been established to provide the retrieval service of standards information.

Over the past decade, ongoing exchanges and mutual learning have facilitated infrastructure connectivity under the BRI. The foreign language versions of about 300 Chinese national standards in the areas such as rail transport, highway, port, electric power and informatization have been released to facilitate the understanding and recognition of Chinese standards in infrastructure construction of BRI countries. A total of 252 standards for wide-body aircraft have been mutually recognized by China and Russia, providing technical support for the bilateral cooperation in the aerospace industry. The coordination of standards on energy infrastructure with Myanmar, Indonesia, Kyrgyzstan, Tajikistan and other countries has also provided technical foundation for project construction.

Over the past decade, mutual benefits and win-win results have underpinned the sustained connectivity among BRI countries. Cooperation on standardization capacity building has been actively carried out, and exchanges and mutual learning with 1,520 officers and experts from 102 countries including Uzbekistan, Zambia and Kenya have been conducted, to enhance diversified people-to-people exchanges. Agricultural standardization demonstration areas have been established in Vietnam, Cambodia, Laos and other countries to increase the yield and profit of distinctive agricultural products such as rice, sugar cane, cantaloupe and dragon fruit, and bring benefits to local people.

Thus, this report is released to summarize the standardization achievements of the 10th anniversary of the BRI, further strengthen the standardization cooperation with BRI countries, foster the high-quality development of the BRI, and extend the benefits of standardization to more countries and people.

PART 1

Strengthening the alignment of standards systems, and building the cooperation consensus of countries

1. Expanding standardization partners across the globe

Since the BRI was proposed, China and BRI countries have gradually reached their consensus on standardization cooperation. In the 138 intergovernmental cooperation agreements in diplomacy, science and technology, commerce, market regulation and other fields signed by China and the BRI countries in Asia, Africa, Europe and Pacific islands, there are 42 ones involving standardization cooperation. Altogether 108 standardization cooperation documents have been signed by SAC and 65 national and regional standardization bodies as well as international organizations (see Figure 1). In these documents, there are 54 ones signed by SAC and 43 BRI countries including Pakistan and Saudi Arabia. Eleven of them have been signed by SAC and eight national standardization bodies of Belarus, Nepal, Kazakhstan and other countries, which have been witnessed by Chinese President Xi Jinping or included as the outcomes of the meetings of heads of state. The cooperation agreements signed by SAC and five national standardization bodies of Germany, the U.K, Greece, Italy and Singapore and one regional standards organization have been included as the outcomes of high-level visits.

By implementing two rounds of the three-year Action Plan from 2015 to 2020, China has constantly consolidated the regional standardization cooperation in Europe, America, Africa, Oceania, Southeast Asia, and the Pacific region.

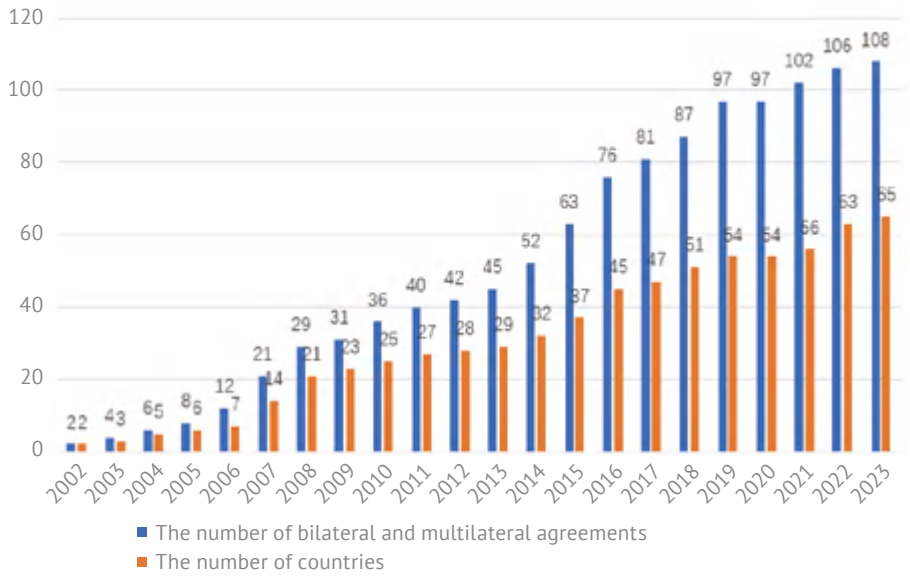


Figure 1: The annual total of bilateral and multilateral standardization cooperation agreements

2. Increasing the impact of standardization cooperation

The standardization cooperation with BRI countries has been constantly driven by the China-ASEAN Summit, China-Japan-ROK Trilateral Summit, China-Arab States Cooperation Forum, China-CELAC Forum, the BRICS mechanism as well as bilateral joint economic and trade commission meetings between China and countries such as Russia, Kuwait, Qatar and Palestine. International cooperation and communication activities have been actively carried out, practical standardization exchanges with more countries have been conducted, and international workshops have been held with the themes such as green, low-carbon and sustainable development, and intelligent manufacturing, to facilitate the alignment of standardization work with more BRI countries. Eight standardization achievements made at the three Belt and Road Forums for International Cooperation have been included in the outcome list, laying a solid foundation for facilitating the Belt and Road connectivity.

3. Making remarkable contribution to international standards

China successfully convened the 39th ISO Annual Meeting in 2016 and the 83rd IEC General Meeting in 2019. Both events received congratulatory letters from Chinese President Xi Jinping, and received positive feedback at home and abroad. China has practically fulfilled its responsibilities in ISO and IEC, deeply participated in the international standardization strategy formulation as well as organizational governance and reform, and established ISO International Standardization Training Base (Qingdao), Hangzhou International Standardization Conference Base, and IEC Promotion Center (Nanjing), providing fundamental support for promoting developing countries to participate in the activities of international standards organizations. It has also carried out twinning programs within mechanisms of ISO and IEC to assist countries such as Laos and Nigeria in international standards activities in relevant areas.

PART 2

Accelerating infrastructure standards connectivity, and improving the connectivity level

1. Standardization contributes to the construction of transport, energy and other infrastructure

In terms of road transport, 18 out of 31 UIC standards such as the Implementation of a High-Speed Railway series, jointly developed by China and BRI countries, have been published. The successful practice of Chinese railway standards has been shared to support the construction of eight railway cooperation projects including the Main Line 1 in Pakistan, China-Kyrgyzstan-Uzbekistan Railway, China-Laos Railway, Mombasa-Nairobi Standard Gauge Railway in Kenya, and Jakarta-Bandung High-Speed Railway in Indonesia. The English, French and Russian versions of 92 Chinese standards on expressway, bridge, tunnel design, construction, quality inspection and evaluation, and other aspects have been released, providing Chinese experience for the expressway construction in developing countries, and serving the projects such as Phnom Penh-Sihanoukville Expressway in Cambodia, Addis Ababa-Adama Expressway in Ethiopia, Maputo-Katembe Bridge in Mozambique, Suramadu Bridge in Indonesia, and Karakoram Highway in Pakistan. Port cooperation projects in Sudan, Sri Lanka, Cameroon, Pakistan and Mozambique have referred to Chinese port engineering standards for the sake of quality assurance. Enterprises and university experts from Vietnam, Pakistan and other countries have jointly participated in the development of Chinese association standard T/CECS 930-2021, *Technical specification for rock compound modified asphalt pavement*, which has greatly improved the resistance of asphalt pavement to high temperature, heavy load and water damage, and extended the lifespan of asphalt roads. The standard on Electronic Toll Collection (ETC) system has facilitated the road traffic in ASEAN countries such as Myanmar, Indonesia and Malaysia. Chinese standards such as GB/T 24549-2020, *Fuel cell electric vehicles—Safety requirements*, and QC/T 839-2010, *Power supply system for ultracapacitor electric city bus*, have been recognized by Chile, Peru and other countries, ensuring the safe and healthy development of local electric vehicles.

In terms of energy infrastructure, MWR, SAC and UNIDO jointly signed the MoU on promoting the international standards for small hydropower with collaborative efforts, and cooperated to develop ISO international standards for small hydropower. The international standardization cooperation has been conducted in various forms in the fields such as solar energy, nuclear power, UHV and smart grid, with 88 international standards developed in these sectors. The commercialization of innovation outcomes across the globe has enabled the publication of 19 CIGRE technical brochures. SAC has worked with the counterparts of Indonesia, Sierra Leone, Brazil and other countries to align standards in the fields such as power grid, hydropower, wind power and solar energy. In the natural gas pipeline projects in Kyrgyzstan, Tajikistan, Uzbekistan, Kazakhstan and Myanmar, standards

harmonization has been carried out to jointly improve relevant standards system. SAC and the National Energy Administration have established a mechanism for aligning energy standards between China and Russia under the China-Russia Standing Working Group on the Inspection and Supervision of Standards, Metrology and Conformity Assessment, to promote the energy standardization cooperation between the two parties. The K2 and K3 units of Pakistan's Karachi Nuclear Power Plant using Hualong One, China's third-generation nuclear power technology with full intellectual property rights, have been delivered based on the standardization cooperation between China and Pakistan. Also, standardization cooperation and exchanges with Argentina have been carried out to advance the nuclear power project there. The English version of 16 Chinese standards, including EJ/T 20199-2018, *Technical requirements for the integrated management system for the physical protection of nuclear materials and nuclear facilities*, has been completed by China Atomic Energy Authority.

2. Standardization ensures the healthy and sustainable development of cities

In terms of smart cities, China and ASEAN member states have jointed released the ASEAN-China Leaders' Statement on Smart City Cooperation Initiative, proposing the communication and mutual recognition of standards regarding smart city technology industries, key fields of application, and integrated solutions. China and BRI countries have developed a number of international standards, such as IEC SRD 63235:2021, *Smart city system—Methodology for concepts building*, and ISO/IEC 24039:2022, *Information technology—Smart city digital platform reference architecture—Data and service*. China, together with ISO, the United Nations Environment Programme (UNEP), AFNOR and other organizations, has contributed to the establishment of the International Smart Sustainable City Club, which is composed of 22 international cities in the U.K., Russia, Brazil and other countries and 17 Chinese cities such as Beijing, Tianjin, Guangzhou and Shenzhen.

In terms of green development and energy conservation, by actively participating in the development of ISO standards, Chinese experts have led the ISO 17741:2016, *General technical rules for measurement, calculation and verification of energy savings of projects*, which has been adopted by 26 countries as their own national standard, contributing Chinese wisdom to the development of such international standards. GB 21455-2019, *Minimum allowable values of the energy efficiency and energy efficiency grades for room air conditioners*, has greatly promoted the effective application of frequency conversion technology. UNEP has made its assessment that the revised standard can guide manufacturers to redesign products, so as to realize the synergistic effect of the transition to energy-saving and low-carbon refrigerant. In addition, 9 Chinese standards for the rice cooker, induction cooker, electric kettle, water heater, washing machine and other products have been adopted by Vietnam, Russia, Pakistan and other countries to promote technical cooperation in the area of energy conservation.

In terms of ecological and environmental protection, the Ministry of Ecology and Environment has established partnership on environmental laws, regulations and standards under the framework of the BRI International Green Development Coalition, carried out comparative studies on ecological and environmental standards, and published the *National Ecological Environment Standards along the Belt and Road*, and the blue book for environmental standards under the BRI.

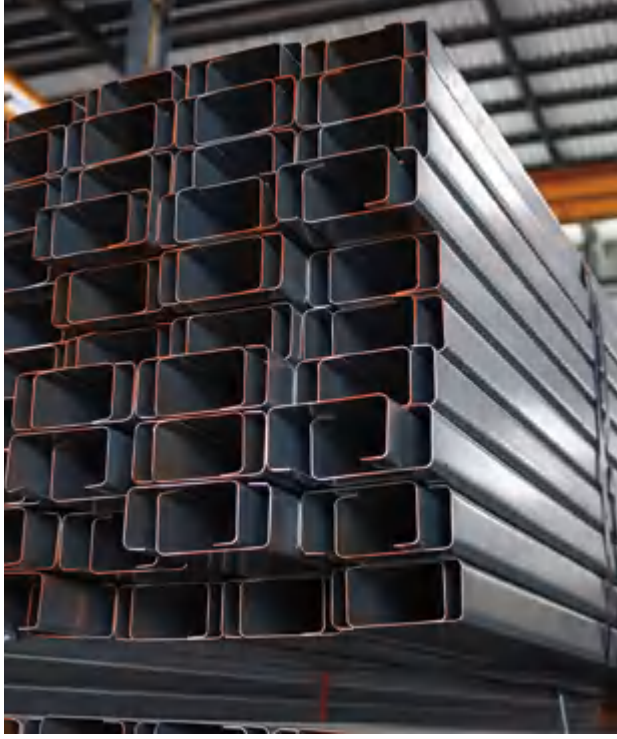
In terms of security protection, the foreign language versions of seven national standards for security inspection equipment, including GB 15208.1-2018, *Micro-dose X-ray security inspection system—Part 1: General technical requirements*, have been released to facilitate Belt and Road partner countries' understanding of Chinese standards. The certification cooperation mechanism in the field of security protection has been established, and the international mutual recognition and cooperation of security inspection equipment have been carried out together with Pakistan, Thailand, Indonesia and other countries. China has implemented testing and certification of security inspection equipment, and issued relevant testing reports and certificates. Overseas industry organizations have adopted the certification results and recommended the use of certified products in their own countries, to facilitate national security cooperation and play a constructive role in promoting peace and stability in BRI countries.

3. Standardization supports mutual aid in the area of people's livelihood

In terms of information and communication, China has actively participated in the activities of international professional standards organizations such as 3GPP to jointly develop 5G and other standards. The sectoral standard GY/T 277-2019, *Technical specification of digital rights management for video audio content distribution*, has been applied in BRI countries. The standards system for digital terrestrial multimedia broadcasting (DTMB) and the supporting standards have supported dozens of DTMB programs in Laos and Cambodia, which have served more than 100,000 users and improved the sense of happiness of local residents.

In terms of aerospace, on the basis of industrial cooperation projects, China and Russia have focused on the joint development of long-range wide-body passenger aircrafts and other civil aircraft projects. After the exchange, translation, comparison and analysis of Chinese and Russian standards, the standardization management bodies of the two countries signed the catalogue of China-Russia mutually recognized civil aircraft standards, which covers 252 Chinese and Russian standards, providing standards technical support for the joint development of wide-body aircraft. The China National Space Administration has compiled the English version of 30 Chinese aerospace standards, including the standard on requirements for quality control in satellite assembly, integration and test. China and Egypt have jointly developed the MisrSat-2 satellite on the basis of Chinese aerospace standards, helping Egypt become the first country in Africa to have satellite assembly and test capabilities and take the lead in localizing satellite development.

In terms of marine observation, the State Oceanic Administration of China has facilitated the cooperation with BRI countries to jointly improve the ISO international standards systems in marine instruments and equipment, marine observation and other fields, with the publication of eight international standards. The ISO international standards in the field of marine survey have become the de facto standard for China-Thailand, China-Mozambique, and China-Nigeria joint marine survey. Twelve Chinese standards in the fields of marine survey, marine instrument testing, and marine engineering equipment have been included in the marine best practice system by the Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO). Six surveying and mapping standards in Laos have been developed through the cooperation with the National Geographic Department of Laos.



PART 3

Deepening the harmonization of trade and investment standards to lay the foundation of economic and trade cooperation

1. Win-win cooperation of international production capacity

In terms of the cooperation on iron & steel and nonferrous metals standards, the Ministry of Natural Resources of China and the United Nations Economic Commission for Europe (UNECE) jointly released the docking documents between two Chinese national standards—GB/T 17766-2020, *Classifications for mineral resources and mineral reserves*, and GB/T 19492-2020, *Classification for petroleum resources and reserves*, and the United Nations Framework Classification for Resources (UNFC 2019). Through the implementation of major projects such as the Indonesian Bonto Batu Hydropower Station, Guinea's Souapiti Hydropower Station, Sierra Leone's Bekongor III Hydroelectric Plant, Cambodia's Morodok Techo National Stadium, and the China-Maldives Friendship Bridge, overseas standardization demonstration projects have been created. Relying on the Ramu Nickel-Cobalt Engineering Standard Demonstration Project in Papua New Guinea and the Ha Tinh Steel Engineering Standard Demonstration Project in Vietnam, 760 standards have been harmonized.

In terms of the cooperation on agricultural and forestry product standards, China has supported Laos in improving the standardization system of the natural rubber industry, developing and publishing standards for products such as standard rubber, concentrated rubber, and special rubber for tires, and promoted the systematic alignment of Chinese and Laotian standards in the field of natural rubber. To address the needs of Kyrgyzstan for agricultural trade cooperation, Shaanxi province has established the China-Central Asia Agricultural Cooperation Center and the Comprehensive Agricultural Science and Technology Demonstration Park, and promoted the use of Chinese standards in crop planting, agricultural product food processing, etc., so that relevant high-quality agricultural products can have easier access to the Chinese market.

In terms of food safety standards cooperation, a Chinese expert has successfully served as the Chair of the Regional Coordinating Committee for Asia of the Codex Alimentarius Commission (CAC). During the term of office, the Chair will strengthen cooperation with other regions in the CAC field on behalf of Asia, and jointly enhance Asia's contribution to the development and revision of CAC standards. The Ministry of Science and Technology has supported the joint construction of the China-Cambodia Food Industry Joint Laboratory, and jointly established a food industry-related standards system with Cambodia through joint research, technology transfer, personnel training and other methods in food production and food safety testing.

2. Trade facilitation cooperation has been advancing in an orderly manner

In terms of supporting the construction of free trade zones, separate chapters on standards, technical regulations and conformity assessment have been established under the Regional Comprehensive Economic Partnership Agreement (RCEP) and the China-ASEAN Free Trade Area Agreement. The implementation of the WTO Agreement on Technical Barriers to Trade has been strengthened to facilitate trade in goods between contracting parties. Under the framework of free trade agreements between China and the Gulf Cooperation Council, Israel, Cambodia and other countries and regions, standard coordination and standard information exchange have been promoted, and standardization cooperation with relevant countries has been propelled.

In terms of improving logistics efficiency, the Federation of Carrier and Forwarder Association (CFCFA) of Central Asia Regional Economic Cooperation (CAREC) has developed 29 CFCFA voluntary standards with reference to China's national standards. The first batch of 10 logistics service standards, including the GB/T 33459-2016, *RFID tag application criteria for pallet units used in circulation industry*, have been recognized by the standardization agencies of Kyrgyzstan and Tajikistan. A series of e-commerce extensible language (ebXML) document message standards have been applied to the CAREC Pre-declared Transport System (CATS), significantly improving the logistics and distribution efficiency in the Central Asian region.

In terms of the facilitation of customs clearance for inspection and quarantine, the General Administration of Customs of China signed the *Protocol on Quarantine and Sanitary Requirements for Imported Beef Cattle for Slaughter from Myanmar into China* with the Ministry of Agriculture, Animal Husbandry and Irrigation of Myanmar, and signed the *Protocol on Quarantine and Sanitary Requirements for Imported Beef Cattle for Slaughter from Laos into China* with the Ministry of Agriculture and Forestry of Laos. China's sectoral standard SN/T 4999-2017, *Requirements for the construction of overseas foot and mouth disease free zones where vaccination is practised*, has been adopted as the technical specification for the construction of foot and mouth disease free zones between China and Laos, which has significantly improved bilateral and multilateral trade facilitation between China and ASEAN countries.

In terms of the cooperative construction of overseas industrial parks, the China Council for the Promotion of International Trade has actively participated in related activities such as overseas industrial park promotion meetings, overseas park work meetings, park investment briefings, and the Forum on Global Production Capacity, and carried out successful construction and operation of overseas economic and trade cooperation zones with many mature parks such as the China-Egypt TEDA Suez Economic and Trade Cooperation Zone and the Ethiopia Oriental Industrial Park, and promoted the standardization of parks by using the information service platform of overseas industrial parks. The National Standardization Administration of China (SAC) and the national standardization body of Belarus reached a consensus on the standardization cooperation plan of the China-Belarus Industrial Park.

PART 4

Expanding the integration of financial standards and facilitating the construction of the financial system

1. Increasingly close communication and exchanges on financial standardization

The People's Bank of China has actively conducted bilateral and multilateral exchanges on financial standardization with Russia, Kazakhstan, Kyrgyzstan, Mongolia, Laos, Myanmar, Cambodia, Pakistan and other countries, and shared standardization work experience through holding publicity seminars, providing Chinese financial standard catalogs, and establishing standardization work information sharing and cooperation mechanisms. It has also explored standards mutual recognition, effectively strengthened rule alignment and standards interconnection, and provided standards support for developing mutually beneficial and win-win financial standardization partnerships and serving the high-quality development of Belt and Road financial cooperation.

2. Foreign language versions of financial standards have been constantly enriched

The English, Burmese, Laotian and other versions of Chinese national standards in the financial field such as GB/T 32320-2015, *Basic requirements of bank branches services*, and GB/T 32318-2015, *Criteria of bank branches service evaluation*, have been released, and Chinese financial standards have been translated into Portuguese, Vietnamese, Cambodian and other languages, providing technical reference for commercial banks in BRI countries to improve the quality and level of financial services.

3. Regional financial standardization cooperation has continued to deepen

The People's Bank of China has supported the Asian Financial Cooperation Association (AFCA) to refer to China's standards on bank branch services, personal financial information protection and others, combined with the actual economic development and practical experience of countries and regions along the Belt and Road to develop standards such as the AFCA-BRFC std 001-2021, *Guidelines for bank branches services*, and AFCA-FTCC std 0003-2022, *Guidelines for personal financial information protection*, to contribute to regional financial standardization cooperation.

PART 5

Enhancing people-to-people connectivity by standards and exchanges and mutual learning among civilizations

1. Increasingly close standards cooperation on people-to-people exchanges

Strengthening exchanges of standardization. The China-ASEAN Standardization Cooperation Forum was held in South China's Guangxi Zhuang autonomous region, where the Nanning Initiative and Liuzhou Initiative were issued to reach the consensus on promoting standardization cooperation. Held in Qingdao city, Shandong province, the Qingdao Forum on International Standardization focused on hot issues such as modern marine industry, intelligent manufacturing, sustainable water resources, new display technology, and standardization capacity building. The 2nd B&RUAS Summit Forum on Standardization Education and Research Cooperation was held in Xi'an, Shaanxi province, which released the *Xi'an Declaration of the Belt and Road University Alliance for Standardization Education and Academics (B&RUAS)*. The Forum on Standardization for China-Mongolia Economic and Trade Activities was held in Inner Mongolia autonomous region, where attendees shared experience and discussed topics on standardization cooperation, customs clearance facilitation, and standardization of Mongolian medicine. The "Belt and Road" Tea Quality Standardization Chibi Green Brick Tea Summit was held in Hubei, with the release of the Xianning Consensus and the Chibi Initiative to promote the connectivity and high-quality development of tea industry by high standards. The China Yiwu International Commodities (Standards) Fair and the 6th SMEs Standardization International Conference were held in Yiwu to capitalize on standardization to facilitate the global transaction of SMEs. The China Forum on Standardization of Trade in Services was held by China Council for the Promotion of International Trade (CCPIT), which facilitates deeper standardization cooperation in fields such as digital exhibitions,

e-commerce, human resources, live-streaming economy, and cultural creativity.

Joining hands with BRI countries in standardization. Established by China, Pakistan, Russia, Thailand and Italy, the Belt and Road International Standards Alliance for Proton, Superconductivity and Nuclear Energy Application (PSNS) has issued its standards management measures and the statute, and developed 4 standards. The National Gemstones Testing Center of China, together with the Gem and Jewelry Institute of Thailand, Gemmological Institute of India, and China Gems & Jade Exchange, jointly initiated and established the Asia-Pacific Gemstone and Technology Standardization Alliance, promoting the development of international trade in jewelry.

2. Outstanding standards cooperation in the field of health services

In terms of epidemic prevention and control, the standards comparison and analysis for 10 types of products including masks, protective suits, and gloves was carried out, involving 440 domestic and foreign standards, with the release of 8 reports for key epidemic prevention products between China and Europe, Russia and other regions. Special columns for the release of standards for epidemic prevention were added on the ISO official website, the Chinese and English websites of the National Standardization Administration of China, the Standard Information Platform Contributed by the BRI countries, and various domestic and foreign standards information cooperation platforms. Relevant information such as the list of China's standards for epidemic prevention products, the comparison and research information of domestic and foreign standards for epidemic prevention, and the foreign language versions of relevant national standards were released timely, providing standards information services for epidemic prevention in BRI countries.

In terms of medicine and health, Chinese experts served as the co-chair of the standards working group of the International Medical Device Regulators Forum (IMDRF), proposed a new working item of "updating the list of international standards recognized by IMDRF members", and led the development of documents such as the *Analysis Report on the Recognition and Use of Standards* and the *List of Recognized Standards*, which were unanimously recognized by all members, providing strong support for the recognition of medical device standards among the BRI countries. In collaboration with South Africa, Singapore and other countries, 81 international standards for traditional Chinese medicine were developed and released, and their promotion and application were actively carried out to enhance the health and well-being of people around the world.

3. Solid standardization foundation for people-to-people connectivity

Strengthening cooperation in standardization capacity building. Sixteen seminars on standardization for BRI countries were held, enabling 421 standardization officials and experts from 50 countries in Asia, Africa and the Americas to learn from each other and jointly improve their standardization capabilities, which has expanded the circle of friends in the field of standardization. The National Poverty Alleviation Office, in collaboration with relevant departments, has organized 38 foreign aid training programs, including 35 programs funded by the China International Development Cooperation Agency, to cultivate standardization talent for poverty alleviation.

Providing innovative standardization services overseas. The China-ASEAN Automotive Standards

and Regulations Research Center was inaugurated in Indonesia, kicking off the cooperation between China and ASEAN countries in automotive standardization. A regular exchange mechanism has been established through the long-term dialogue with the automotive administrative departments and standardization institutions in ASEAN countries. Through cooperation platforms such as joint laboratories (joint research centers), technological transfer centers, and joint research and technology demonstration bases, China has helped BRI countries enhance their scientific and technological innovation capabilities, sharing Chinese technologies, products and standards. Currently, 33 joint laboratories have been approved for construction.

Accelerating the translation of Chinese standards into foreign languages. In fields such as transportation, oil and gas, energy and electricity, information technology, finance, ocean, railway, as well as safety and emergency response, foreign language versions of national standards were developed, and over 1,700 foreign language versions of national standards were released. In fields such as nuclear power, machinery, steel, optical fibers and cables, and tea, the translation of urgently needed standards for products, testing, and management have been expedited according to the demands of economic and trade interactions as well as cooperative projects, and over 1,000 foreign language versions of sectoral standards were released.

Catering to the urgent need of BRI countries for mutual understanding of standards, the Standard Information Platform Contributed by the Belt and Road Countries and the Smart Translation System of Standardization provide assistance for international trade, improve trade efficiency, and reduce trade costs.

Main achievement 1

Actively holding meetings on international standardization cooperation, and seeking more extensive international consensus

(1) Qingdao Forum on International Standardization held in 2017, 2019, 2021 and 2023
(2) China-ASEAN Standardization Cooperation Forum held in 2019, 2021 and 2023
(3) China-South Asia Standardization Cooperation Conference held in 2016, 2018 and 2020
(4) Meeting of Heads of BRICS National Standardization Bodies held in 2019, 2020, 2021, 2022 and 2023

Main achievement 2

Standardization achievements at the Belt and Road Forum for International Cooperation (BRF)

(1) At the first BRF held in 2017, China signed initiatives for strengthening standards cooperation and promoting the BRI with relevant departments in Russia, Belarus, Serbia, Mongolia, Cambodia, Malaysia, Kazakhstan, Ethiopia, Greece, Switzerland, Turkey, the Philippines and other countries.

(2) At the second BRF held in 2019, SAC initiated and established the Standard Information Platform Contributed by the Belt and Road Countries to strengthen the exchanges and sharing of standards information with related countries; the Ministry of Water Resources (MWR), SAC and United Nations Industrial Development Organization (UNIDO) signed the MoU on promoting the international standards for small hydropower with collaborative efforts; SAC and the Saudi Standards, Metrology, and Quality Organization (SASO) issued the action plan for technical cooperation agreements (2019-2021); China-Russia Task Force on Civil Aircraft signed the list of mutually recognized standards on civil aircraft between China and Russia.

(3) At the third BRF held in 2023, SAC and the Kazakhstan Institute of Standardization and Metrology signed a MoU on cooperation; MWR, SAC and UNIDO signed a MoU on driving sustainable rural development based on harmonized international standards on small hydropower; SAC and the African Electrotechnical Standardization Commission (AFSEC) signed a MoU on cooperation; the *Report on Standardization Achievements of the 10th Anniversary of the BRI* was unveiled.

Main achievement 3

Carrying out twinning programs for assisting BRI countries to improve their international standardization level

SAC and the Standards Organization of Nigeria (SON), as the IEC National Committee of China and Nigeria respectively, officially signed the China-Nigeria twinning program in IEC on February 15, 2021, entering into a partnership for two years. In the program, SAC has provided technical assistance and training for SON, helped SON understand the latest development trends and cutting-edge technical knowledge, and carried out technical communication and cooperation. They have jointly developed international standards, ensured technologies and products to be in line with international standards and best practice, and promoted and publicized sustainable energy sources and environmental protection technologies, to raise the public's awareness on sustainable development. The program is designed to enhance the standardization work capability of the IEC National Committee of Nigeria, better cope with the challenges in the areas of energy, climate change and environment, and realize sustainable development.

Main achievement 4

Landmark projects on Belt and Road standards connectivity

In recent years, China's railways, especially high-speed railways, have achieved rapid development, and become a business card of the BRI. Together with overseas engineering projects, Chinese railway standards have provided full chain support for the railway construction in BRI countries. First, the China-Laos Railway and Jakarta-Bandung High-Speed Railway have posed a prominent demonstration effect and facilitated local transportation and trade. Second, key Belt and Road projects such as Mombasa-Nairobi Standard Gauge Railway in Kenya and Addis Ababa-Djibouti Railway in Ethiopia have played an essential role in driving the economic growth in Africa. Third, the connectivity projects such as the China-Nepal Cross-Border Railway and the China-Kyrgyzstan-Uzbekistan Railway have helped BRI countries make the most of their respective market and resource advantages and deepen cooperation in the industrial chain and supply chain.

Main achievement 5

The standards system for DTMB and the supporting standards improve people's happiness in BRI countries

The National Radio and Television Administration has actively participated in international professional forums on radio and television, conducted technical and business exchanges on China's standards system for radio and television technology as well as its implementation by holding special forums and exhibitions, and promoted the alignment and mutual recognition of national standards with BRI countries. The standard on DRM for video and audio content has been recognized by international mainstream content providers, technology providers, chip manufacturers, end product manufacturers, and major international security laboratories in countries including the U.S. and regions including Europe, promoting the internationalization of related DRM technologies and standards system. The Ministry of Industry and Information Technology has actively promoted the demonstration of terrestrial DTV standard and technology in China-Cambodia & Laos and with counterparts in Cambodia and Laos, signed the cooperation agreement for the project on assisting the DTV transmission demonstration in Pakistan, and adopted the DTV (DTMB/DTMB-A) standards to promote the construction of DTMB/DTMB-A in East Timor, Laos and Cambodia.

Main achievement 6

Strengthening the research on commercialization and application of standards achievements for surveying and mapping basis

The National Basic Geographic Information Center of China has carried out research on the applicability of superior technical standards of modern surveying and mapping benchmarks in Southeast Asian countries and the commercialization of these standards. It has also carried out the analysis of the applicability of standards such as GB/T 28588-2012, *Specifications for the continuously operating reference station using global navigation satellite system*, GB/T 12897-2006, *Specifications for the first and second order leveling*, and GB/T 18314-2009, *Specifications for global positioning system (GPS) surveys*, in Pakistan and other Southeast Asian countries, promoted the acceptance and application of GB/T 28588-2012, and vigorously driven the international cooperation on surveying and mapping benchmark standards with Southeast Asian countries.

Main achievement 7

Using the "soft connectivity" of standards to create a "hard mechanism" for agricultural standardization cooperation

Guangxi Zhuang autonomous region has taken advantage of China's agricultural planting technology to carry out research on the applicability of agricultural standards in ASEAN countries, promoted standardization concepts and agricultural planting technologies in ASEAN countries, and built a number of agricultural standardization demonstration areas. At present, relying on the China-Laos Improved Crop Variety Test Station, Pandong village in Laos' Vientiane city, has established agricultural standardization demonstration areas on rice, grapes, corn, Hami melons, and dragon fruits. The demonstration area has adopted standardized planting technology to solve the problem of extensive planting of agricultural products and low-yield varieties, and generally increased production by more than 15%, significantly increasing the income of local farmers.

Main achievement 8

China's bank card standards have helped BRI countries to promote financial inclusion and improve digital payment levels

The People's Bank of China has actively promoted the use of China's bank card standards and mobile payment standards to support financial inclusion in BRI countries. China UnionPay has supported Thailand in creating its own debit card brand with reference to China's technical sectoral standards for bank cards, and participated in the construction and operation of the Lao National Payment Network (LAPNet).

China has also provided standards for cross-border chip cards to the Asian Payment Network, which has become the voluntary chip card standard for Myanmar's banking industry. China's UnionPay card acceptance network has covered 180 countries and regions abroad, and 78 countries and regions have issued UnionPay cards. Nearly 90% of the BRI countries have opened UnionPay card business, covering more than 19 million merchants and 600,000 ATMs, and more than 170 million UnionPay cards have been issued in the region.

Main achievement 9

The Standard Information Platform Contributed by the Belt and Road Countries

The Standard Information Platform Contributed by the Belt and Road Countries was launched in 2019, which is the first platform to classify and translate the standards information related to BRI countries. The platform covers the standardization profile of 149 BRI partner countries, including China. The total amount of standard bibliographic data has reached 1.32 million items. It provides precise search services for the standard bibliographic information of 59 countries as well as 6 international and regional standardization organizations. The precise search services enable the orderly access to standards information with a high-quality user experience. By using visualization methods, users can analyze the characteristics and quantity of standards in various countries on the platform, including hot words of standards, distribution of standards fields, and trends of standards release. It also has a column for domestic and international standardization news, which timely tracks the latest standardization news of various countries and international standardization organizations, providing standardization information support for the BRI.

Main achievement 10

The Smart Translation System of Standardization

The Smart Translation System of Standardization was launched in 2019 to assist in the translation of Chinese standards. Based on the achievements of national major science and technology projects, the Translation Corpus for Foreign Language Version of Chinese Standard Literature was established, which contains 60.16 million Chinese characters and 24.54 million English words. With the development of a massive big data corpus interface, the platform adopts the most advanced neural network translation technology and computer-assisted post-editing technology, which can provide rapid Chinese-English translation services with various formats of standard texts, standardization documents, and other materials in various fields. It supports online splitting and combining of words, enables users to establish personal memory banks and terminology banks online, and retains the original layout format of the translated text. The platform has two distinctive features. First, it incorporates the concept of "joint contribution and shared benefit", where each visitor serves as a user and a contributor to the platform. Second, it is equipped with an independent English interface, providing a fast translation channel for foreign users to view and use Chinese standards. In addition, the online translation eliminates the update process, and provides real-time translation of standards text and standardization literature.

Conclusion

Chinese President Xi Jinping announced eight major steps that China will take to support the joint pursuit of high-quality Belt and Road cooperation at the Third Belt and Road Forum for International Cooperation. At a new historical starting point, the joint construction of BRI becomes more innovative and dynamic. China should seize new opportunities, highlight new achievements and make new breakthroughs in the Belt and Road standards connectivity, playing a greater role in facilitating the high-quality BRI development through soft connectivity.

First, continue to deepen international cooperation in standards and build a mutually beneficial partnership. The cooperation on standards will be expanded, and the integration of standards cooperation into economic and technological cooperation among countries will be promoted. Vigorous efforts will be made to propel the alignment and cooperation of standards with BRI countries, further enhance standards exchanges in Asia-Pacific, the Americas, Africa and other regions, carry out standards information exchange and sharing, and promote universally recognized standards and best practices among BRI countries, to build the solid cooperation mechanism by the soft connectivity of standards.

Second, strive to enhance the compatibility of standards system, and strengthen standards support for trade facilitation. In terms of key products for bilateral and multilateral trade, scientific and technological innovation development, and industrial transformation and upgrading among BRI countries, China will vigorously adopt international standards, jointly develop standards with more countries, coordinate standards at home and abroad, strive to enhance the consistency of standards, and promote the compatibility of standards systems. More foreign language versions of Chinese standards will be published, and the translation of Chinese standards for major commodities and oversea contracted projects will be accelerated, to facilitate trade and business.

Third, steadily expand the institutional opening up of standards, and improve the level of opening up of standardization. Focusing on industrial demands, China will continue to increase the breadth and depth of participation in international standardization activities, and promote the opening up and development of standardization. Several measures for steadily expanding the institutional opening up of standards will be worked out. Experts from foreign-funded enterprises are encouraged to participate in China's standardization activities, and Chinese experts are encouraged to strengthen cooperation with experts from BRI countries to jointly participate in the development of international standards. As for key regions and countries, a globally-oriented network of high-standard free trade areas will be built through the opening up and cooperation of standards.

Fourth, lay a solid foundation for standards to go global, and enhance the support and guarantee capacity of standards. More high-quality international standards seminars will be held, and cooperation with more BRI countries in standardization capacity building will be carried out, to strengthen mutual learning and exchange. Efforts will be made to constantly improve the services of the Smart Translation System of Standardization and the establishment of the Standard Information Platform Contributed by the Belt and Road Countries, to realize the joint contribution for shared benefits with more countries, and provide fundamental support for promoting the high-quality development of the BRI.

翻译/靳吉丽 曹欣欣 方洛凡

(Translated by Jin Jili, Cao Xinxin and Fang Luofan based on the report in Chinese)

International standards inject new impetus into global tourism industry

中国牵头制定两项旅游国际标准 为全球旅游业注入新动能

By Jin Jili
文/靳吉丽

Two international standards on tourism, ISO 9468:2025, *Tourism and related services—Online travel agency (OTA)—Guidelines for online accommodation booking platform services*, and ISO 25639-1:2025, *Exhibitions and events—Part 1: Vocabulary*, were recently released by ISO, the development of which was led by China.

These are new achievements after China played a leading role in the development of the international standard for tourist information service published at the end of 2024, injecting new impetus and contributing Chinese wisdom to the high-quality development of the global tourism industry.

Sharing best practices with the world

The Tourism Quality Supervision and Management Institute of the Ministry of Culture and Tourism has served as the domestic mirror committee of ISO/TC 228 on tourism and related services since 2020, representing China in fulfilling the obligations of a participating member of ISO.

With the fast digital transformation of the global tourism industry and the thriving development of the exhibition and event industry, there is an increasingly prominent demand for standardization in these industries.

China has the largest outbound tourists for many consecutive years, but tourists have long faced sore points such as difficulty in overseas information acquisition and high costs for safeguarding rights. Meanwhile, the recovery of inbound tourism has the pressing needs for internationally consistent service quality. To enable global tourists to enjoy high-quality tourism services both at home and abroad, there is an urgent need to develop international standards and achieve international consistency.

By uniting multiple forces, the Institute has sorted out over 100 relevant national and sectoral standards in China, and aimed at the fields without relevant international standards. Targeted at online tourist information services and online accommodation booking, it proposed three international standards projects that were approved in 2021. As one of the results, ISO 14785:2024, *Tourism and related services—Tourist information services—Requirements and recommendations*, was released at the end of 2024.

China has ranked among the top in the world in terms of the transaction scale of online accommodation booking, accumulating massive data, diversified scenarios and rich cases, and has cultivated many online travel agencies. In recent years, China has gradually become a main venue of global exhibitions and events, and excellent Chinese enterprises have gone abroad to provide services for global customers.

Tourism standardization started relatively early in China. After years of accumulation, both theories and practices have been collected, and a group of experts have been cultivated in the process. All these have laid a solid foundation for the development of international standards ISO 9468:2025 and ISO 25639-1:2025, according to Li Guang, a member of SAC/TC 210 on tourism.

ISO 9468:2025 helps provide globally trusted tourism services

With the rapid development of the online travel market, online accommodation booking platforms have improved service efficiency, but some issues are also exposed such as difficulty in cancellation or modification, big data price discrimination, authenticity of reviews, and ambiguous boundary of data use.

To address these issues, ISO 9468:2025 defines full-cycle service specifications to ensure transparency at the pre-booking stage, fairness in the transaction process, and credibility of the review system. It provides uniform service guidelines for global online accommodation booking platforms, which is applicable to providers and users of online accommodation booking platforms and various accommodation services.

ISO 9468:2025 has four characteristics, said Yao Xin, Secretary General of the China Council for the Promotion of International Trade Commercial Sub-council, and Convenor of ISO/TC 228/WG 19 on online travel agencies and ISO/TC 228/WG 20 on exhibitions and events.

First, it provides uniform service guidelines for global online accommodation booking platforms, enabling tourists to enjoy accommodation booking service at ease. It clearly defines responsibilities of platform operators and accommodation service providers, specifies service terms at the ordering, payment, cancellation or modification, review and other stages, and puts forward service guarantee requirements in the areas such as information security, financial security, and privacy protection.

Second, it safeguards users' right to know and choose additional services, reducing problems such as big data price discrimination, involuntary bundled consumption, and hidden fees. It recommends that booking platforms should not set unfair transaction conditions based on big data analysis. To prevent hidden consumption, it makes clear that merchants must provide clear and transparent details of charges, and points out that platform operators can recommend other supporting services to users. But platform operators should not set other services such as pick-up service as default options of booking, which are considered as hidden bundled consumption.

Third, it establishes a real, fair, and user-friendly review system, realizing public supervision of online accommodation booking platforms. It suggests that booking platforms should strictly verify the authenticity and compliance of reviews, and strictly control fake and improper reviews. Meanwhile, it recommends that platforms should grant users the right to edit reviews within a set time period and screen them according to different indicators, thereby optimizing the review reading experience of users.

Fourth, it emphasizes the accessible services for special groups such as the elderly and people with disabilities. It provides the list for key accessibility features, highlights the convenience in parking, reception, and services, and suggests setting up accessible facilities in key locations such as bedrooms and bathrooms. By offering diversified information, it ensures that platforms are applicable to all kinds of groups, providing global tourists with better, fairer and more comfortable booking experience.

The project of ISO 9468:2025 was finally approved with a high voting rate based on thorough preliminary research and precise analysis of the international situation. Experts from 16 countries including Germany, Spain, and Russia, as well as 5 international organizations have participated in the development, fully reflecting the principle of international consensus.

ISO 25639-1:2025 harmonizes terminologies in exhibition and event activities

The exhibition and event industry is an important driving force for foreign trade and economic growth, and it also plays an indispensable role in enhancing urban images and promoting the development of related industries, the dissemination of information and technologies, and international exchanges and cooperation.

The international standard ISO 25639-1:2025 harmonizes the terminologies in the industrial chain, enabling organizers, venue operators, service providers, and exhibitors to use accurate terminologies in the preparation, organization, and operation of exhibition and event activities. It reduces confusion and misunderstanding caused by inconsistent standards, and improves work efficiency, mutual understanding and communication, according to Li Qi, General Manager of Beijing Pico Exhibition Management Co., Ltd.

The standard is a revised version, which aims to adapt to the booming global digital economy and meet the requirements of implementing the UN Sustainable Development Goals. Compared with the 2018 version, the new standard has been improved in multiple aspects, Yao Xin said.

First, the scope has been expanded. The standard name has been changed to exhibitions and events. It aims to align with the scope of ISO/TC 228/WG 20, which provides a more comprehensive guidance framework and future plan for the sustainable and healthy development of the industry, and lays a technical foundation for promoting the upgrading of relevant technical agencies in China.

Second, the structure has been improved. The revised standard incorporates a new category of related activities for the first time, and introduces terms such as on-site services, which helps enhance the overall standardization and operational efficiency of the industry. Meanwhile, in accordance with the *ISO/IEC Directives*, the layout of chapters has been adjusted to make the standard more complete, clearer, and easier.

Third, relevant terms have been enriched. The revision enriches the conceptual system of the exhibition and event field, and adds 39 professional terms covering physical, hybrid and online exhibitions and events. The terms such as summit, forum, and convention further improve the definition system of conference categories. In addition, terms such as statistical analysis, data audit, intellectual property, and event legacy are added.

Fourth, definitions of some terms have been updated. Some terms have been modified with accurate connotation to meet the current needs of the industry. For example, with the emergence of online and virtual exhibitions, on-site personnel are not necessary, and the definition of exhibitor has also been modified accordingly.

Standardization enables a new industrial ecosystem

So far, ISO 9468:2025 has been adopted by countries such as the U.K., Denmark, Bulgaria, and Montenegro, and ISO 25639-1:2025 has been adopted identically by the U.K.

The two international standards are expected to facilitate the mutual understanding and trust among trading parties, reduce trade barriers, lower transaction costs, improve transaction efficiency, as well as balance and protect all parties' interests. They are of great practical significance for actively promoting international service trade in tourism, exhibitions and events, and other fields, Li Guang stated.

The two international standards are not only a new breakthrough but also a new start for the collaborative development of the global tourism industry.

Contributing to the international standards development, China is using standardization as a bond to help eliminate barriers to trade in tourism services, optimize resource allocation, and inject new momentum into building an open global economy. Standards will continue to benefit the high-quality development of the tourism industry.

With years of efforts, China has made greater contribution to ISO/TC 228. As of the end of April 2025, 10 standard projects of TC 228 have been approved, covering many fields such as online travel agencies, sustainable tourism, camping, and buffets. Chinese experts have served as convenors of four working groups, AG 1 on communication, WG 3 on tourist information and reception services, WG 19 and WG 20, leading the international standards development in their respective fields, and bringing together more than 100 experts from 27 countries including France, Germany, Spain, Russia, and South Korea. In 2026, the plenary meeting of ISO/TC 228 will be held in Hangzhou city, Southeast China's Zhejiang province, where global experts will discuss new directions of tourism standards.

In the next step, the Ministry of Culture and Tourism and the State Administration for Market Regulation will continue to promote the internationalization of standards in the fields of culture and tourism. While sharing Chinese experience, they will also widely absorb advanced international experience and actively adopt suitable international standards as national standards, so as to promote the coordinated development of global tourism, drive the standardized development of the exhibition and event sector, and provide better services to global tourists!

China contributes to the establishment of ISO/TC 8/SC 27 for global coordinated port development

中国推动成立ISO港口码头分委会 指引全球港口协同发展

By Fang Luofan
文/方洛凡

Ports, the core hub of global supply chains, serve as vital links in the economic and trade exchanges among countries. Efficient, safe, green and smart ports are essential for the smooth operation of global trade. Recently, ISO established ISO/TC 8/SC 27, *Ports and terminals*, the secretariat of which is held by China. This is a big breakthrough of China's participation in the international standardization activities in the area of transportation.

An inaugurating ceremony of ISO/TC 8/SC 27 was hosted by China Waterborne Transport Research Institute (WTI) and Shanghai Zhenhua Heavy Industries Co., Ltd. on May 20, which was directed by SAMR and the Ministry of Transport (MOT). The meeting was attended by Wang Gang, Minister of Transport, Deng Zhiyong, Vice Minister of SAMR and Administrator of SAC, Xiao Han, Director General of Standards Innovative Management Department of SAMR, as well as relevant experts and representatives of enterprises.

A press meeting was also held by MOT on that day to introduce China's progress in establishing ISO/TC 8/SC 27, deepening international standardization exchanges and cooperation, and promoting high-level institutional opening up of standards. The meeting was attended by Xu Wenqiang, Director General of Science and Technology Department of MOT, Sun Wei, Deputy Director-General of Standards Innovative Management Department of SAMR, and Chen Zhao, Vice President of WTI, and Li Yiming, Chair of ISO/TC 8/SC 27.

Making remarkable achievements in port construction

With a long coastline and multiple natural ports, China has leveraged rich resources and made great effort for infrastructure construction in ports, takes a leading role in the overall scale of coastal ports. Among the top ten global ports in terms of freight volume and container throughput, Chinese ports account for eight and six of the ranks respectively. As for the intelligent development of ports, the number of automated terminals that have been built and are under construction in China ranks the first in the world. The world record for the operation efficiency of container handling at automated terminals is set and maintained by Chinese ports.

China has attached great importance to the standardization construction of ports. Fruitful results have been made in aspects of port construction and operation, such as construction guidelines, operation requirements, operation criteria, as well as green and low-carbon development. Also, a standards system for ports featuring safety, greenness, intelligence, and efficiency has been established, providing a reference for global port development.

ISO experts have visited Shanghai, Tianjin, Qingdao and other Chinese port cities since last year, and highly recognized the standardization construction of ports and terminals in China. MOT has mobilized domestic enterprises and institutions to participate in international standards development, carried out a series of international standardization exchange activities, and organized the technical research on a batch of international standards proposals. With the support of SAC, ISO/TC 8/SC 27 was finally approved to be established with the joint efforts of MOT, WTI and leading central enterprises.

Steadily enhancing the international level of standards for transportation

During the 14th Five-Year Plan period (2021-2025), with the guidance and support of SAC, MOT has upheld openness, inclusiveness and win-win cooperation, and made notable achievements in the following aspects to steadily promote the connectivity of standards, according to Xu Wenqiang.

First, enhancing the efficiency of international standards development. In the fields such as railway track quality inspection and electronic container seals, China has contributed to the development and release of 18 international standards and the approval and development of another 18 ones. Based on demand analysis and overall planning, China is promoting the sharing and coordination of technologies.

Second, promoting the publication of foreign language versions of Chinese standards. Over 550 foreign language versions of transportation standards have been released. Among them, 125 foreign language versions of standards serve the Belt and Road Initiative, which have been successfully applied in key projects such as the Indonesian Jakarta to Bandung High-Speed Railway and the Phnom Penh-Sihanoukville Expressway in Cambodia.

Third, actively taking part in international standards governance. China successfully assumed the presidency of the working group for geographical coding of the Universal Postal Union, held the rotating secretariat and chair of ISO/TC 269, *Railway applications*, and established 12 technical counterparts with international standards organizations such as ISO, IEC, and ITU in the field of transportation.

Fourth, laying a solid foundation for the internationalization of standards. MOT has continually accelerated the cultivation of international standardization experts, encouraged a number of experts to register in international standards organizations, and established a talent pool in the field of transportation. A cooperation mechanism for waterway standards and metrology between China and Indonesia has been established. Furthermore, a platform on international standards research and development has been established by central enterprises in the transportation industry, fully leveraging their technological innovation advantages, and strengthening the development of international standards.

MOT will strive to build an advanced transportation standards system with optimized structure, advanced rationality and international compatibility, and provide more Chinese experience for the technical coordination and smart and green transformation of global transportation.

Adapting to new trends of globalization and expediting institutional opening up

Sun Wei introduced the progress made by SAMR (SAC) in the institutional opening up of standards in four aspects.

First, the scope of international cooperation on standards has been expanded. China has signed 125 cooperation documents with 71 national, regional and international organizations, and promoted the effective operation of various bilateral and multilateral cooperation mechanisms. More than 2,300 foreign language versions of national standards have been published. Over 250 standards in the fields of civil aircraft and coal have been mutually recognized by China and Russia. Efforts have been made to strengthen the standards cooperation in areas such as green and low-carbon development, and digital economy. Since 2015, a total of 60 international standards training courses have been held, attracting nearly 2,000 officials and experts from over 100 countries.

Second, the governance capability of standards internationalization has been enhanced. China earnestly fulfills the responsibilities and obligations as a member of international standards organizations, and proposed suggestions on issues such as development strategy, policies and systems, long-term plans, and key projects of international standardization. China held the chairs and secretariats of the technical bodies of international standards organizations in areas such as intelligent shipping, mechanical energy storage, cultural heritage conservation, and creative digital design.

Third, the internationalization level of standards has been raised. Relevant stakeholders are supported to actively participate in the development of international standards. An international standardization talent training system has been established to constantly cultivate interdisciplinary professionals on international standardization.

Fourth, the coordination level of domestic and international standards has been improved. The *Measures for the Adoption of International Standards* has been revised to stimulates standards comparison and adoption. By the end of 2024, the overall conversion rate of international standards in China has exceeded 83%. China has vigorously participated in the development of international standards in terms of e-commerce, shipping and marine technologies, and cold-chain logistics. Its efforts in international standardization have been widely recognized, with more than 200 Chinese experts and the secretariats held by China awarded by international standards organizations.

The institutional opening up of standards is an inevitable choice for China to adapt to the new circumstances of globalization. SAMR (SAC) will further deepen reform and expand opening up, promote the connectivity of policies, rules and standards, and provide strong support for high-quality economic and social development.

Standards lead intelligent, green and low-carbon transformation of ports

MOT has constantly strengthened the standardization work of ports in recent years. It has unified facility and equipment criteria, standardized operation procedures, and optimized resource allocation to ensure safety and quality, underlying the construction of efficient, intelligent, safe, green and advanced ports. Standardization promotes high-tech innovation, high-level opening up and high-quality development of ports, playing a fundamental and leading role in enhancing the strengths of ports and facilitating the smooth operation of international logistics channels.

At the international level, by reducing technical barriers, unified port standards can facilitate the circulation of ships, goods and information among ports in different countries and regions, and enhance global logistics efficiency. Standardized port facilities and operation procedures can effectively reduce the adaptation costs of ships among different ports, benefiting trade facilitation. Moreover, a common framework of standards provides the technical basis to connect ports, supporting the coordinated development of global ports.

Contributing to transformative development of global ports and terminals

Within the framework of ISO/TC 8/SC 27, China will vigorously cooperate with other member states, and jointly develop standards for the operation, facilities, systems and comprehensive application of technologies of ports and terminals. Its focuses are as follows: first, general standards including terminologies; second, standards for facilities and systems, including guidelines for layout of ports and facilities, as well as terminal operation system networks; third, operation and management standards, including requirements for shore-based operations, yard operations, horizontal transportation operations at different types of terminals; fourth, standards for comprehensive application of technologies, including application guidelines for automation technology, electrification technology and clean energy technology.

ISO/TC 8/SC 27 will develop a series of international standards for ports and terminals with global influence, making them the core driving force for the development of the industry. It will build global consensus, share advanced and applicable technologies and best practices, and contribute to the UN SDGs. As the secretariat, China will earnestly fulfill its duties and join hands with other member states to establish a systematical, scientific and efficient international standards system for ports and terminals, which will bring new impetus to the high-quality development and high-level security of global ports.

CEN and CENELEC release the annual report for 2024

2024 saw a lot of changes, marked by the European elections and the arrival of the new institutions. CEN and CENELEC reaffirmed the commitment to a strong and resilient European Standardization System, highlighting the strategic role of standards in strengthening the Single Market and supporting Europe's competitiveness.

In 2024, CEN and CENELEC made significant progress on main priorities, including sustainability, digitalization, innovation, and international cooperation. Areas such as artificial intelligence, cyber resilience, quantum technologies, and data management were put in focus, supporting the twin green and digital transitions at the core of Europe's strategic agenda. Our continued efforts in sustainable construction, the circular economy, and corporate sustainability reporting helped industries drive forward the shift to a more sustainable future. In this context, CEN and CENELEC continued on the path to building a standardization system that is sustainable, competitive, and inclusive.

This Annual Report shines a light on these and many other achievements. The report is available in a fully digital format, which allows for an accessible experience, and it reflects CEN and CENELEC's dedication to the twin green and digital transition.

Some highlights that underline the hard work of the CEN and CENELEC community include: supporting the green transition of the European industry and fostering the development of new clean technologies and sustainable energy sources; actively contributing to Europe's digital transition with AI and ICT standards; continuing to implement the joint CEN and CENELEC Strategy 2030; and continuing efforts to make standardization system more inclusive and open to the world, to better meet the needs of industry and civil society.

The Annual Report can be found on: **https://ar2024.cencenelec.eu/**

(Source: CEN)

Solving the AI sustainability dilemma

According to the International energy Agency (IEA), a standard AI-oriented data center consumes as much electricity as 100,000 households. Data centers also use enormous amounts of water to build and cool electrical components and they also create a lot of electronic waste.

Yet AI is also being used in many and growing innovative ways to help combat the climate crisis such as mapping the destructive dredging of sand and providing data around emissions of methane. According to the UN's International Methane Emissions Observatory (IMEO), "reducing methane emissions is the single fastest way to slow global warming as we decarbonize".

Recognizing the power of international standards in this space, the joint IEC and ISO committee for AI, SC 42, have published a technical report as a firm foundation on which more specific standards in this area can be developed.

ISO/IEC TR 20226, *Artificial intelligence—Environmental sustainability aspects of AI systems*, provides an overview of all the elements of AI that have an impact on the environment, including workload, use of resources, carbon impact, pollution, waste and much more. By covering the entire life-cycle of AI system, it provides reliable support to any project related to AI system environmental sustainability, including future standards.

In addition, SC 42, along with the joint IEC and ISO committee on sustainability, IT and data centers (SC 39), have established a joint advisory group (JAG): AI and Sustainability.

Capitalizing on the expertise of the members in the fields of AI and sustainability, the JAG will undertake a comprehensive analysis of the issues, identify what standards exist that can help and where standardization is needed. From there they will provide a roadmap with recommendations for potential new projects.

(Source: IEC)

Webinar "CRA standards unlocked: Navigating smartcards and similar devices & secure element compliance under the Cyber Resilience Act"

July 25, online

Join CEN as the lead rapporteur of this initiative takes you inside the development of the European harmonized standards for smartcards, similar devices, and secure elements. This session will provide exclusive insights into the current content and approach shaping the compliance criteria needed to meet the essential requirements of the *Cyber Resilience Act* (EU 2024/2847).

For more information on the event website: **https://www.cencenelec.eu/news-events/events/2025/2025-07-25-webinar-cra-standards-unlocked-webinar-2/**

89th IEC General Meeting

September 15-19, New Delhi, India

This year's IEC General Meeting is an opportunity to reflect on how far we have come and map the road ahead together. From smart grids to energy storage, from eco-design to circular economy principles, IEC work is driving the transition to sustainable systems. But there is still a long way to go. Collaboration is key. Together, we must continue to harmonize global efforts, bridge gaps and ensure that no one is left behind in this transformative journey.

Join IEC at the GM to engage deeply in the discussions, share your insights and explore new ways to amplify the impact of IEC work. For more information on the event website: **https://gm2025.iec.ch/**

ISO Annual Meeting

October 6-10, Kigali, Rwanda

The ISO Annual Meeting is the world's premier event for the international standards community.

This year's event is hosted by RSB, the national standards body of Rwanda. The theme "United for impact" calls us to harness our collective strength in a world that needs bold, lasting change. The ISO Annual Meeting convenes global leaders and change-makers to explore how international standards can unlock progress, foster trust and drive lasting solutions to our shared challenges.

For more information on the event website: **https://www.iso.org/annualmeeting**

World Telecommunication Development Conference 2025

November 17-28, Baku, Azerbaijan

ITUWTDC
BAKU2025
17–28 November 2025
Baku, Azerbaijan

The World Telecommunication Development Conference 2025 (WTDC-25) will be hosted by the Government of Azerbaijan in Baku on November 17-28, 2025.

World Telecommunication Development Conferences (WTDCs) are convened in the period between two Plenipotentiary Conferences to consider topics, projects and programmes relevant to telecommunication development. WTDCs set the strategies and objectives for the development of telecommunication/ICT, providing direction and guidance to the ITU Telecommunication Development Sector (ITU-D).

For more information on the event website: **https://www.itu.int/itu-d/meetings/wtdc25/**

Research on the framework of the cultural heritage digitalization standards system

文物数字化标准体系框架研究

By Huang Jing[1], Yu Tianxiu[2*], Liu Jianyu[1], Qu Liang[1]
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(1. The Palace Museum; 2. Dunhuang Academy)

Abstract: The standards system for cultural heritage digitalization aims to build a clear and logically rigorous framework to guide the development and revision of relevant standards. This system enhances the scientific, systematic, and practical aspects of cultural heritage digitalization. This paper comprehensively analyzes the current status and needs of cultural heritage digitalization and standardization. It further examines the methods used to construct the standards system. Through comparative analysis, it establishes a lifecycle-based framework for cultural heritage. This framework accounts for the unique characteristics of cultural heritage and systematically integrates key processes such as collection, processing, storage, transmission, and utilization of data. The standards system is divided into six sections: general, data, information, knowledge, intelligence, and application. Based on the current digitalization efforts, this paper proposes key standardization directions for each section. This framework ensures the integrity and consistency of data throughout the digitalization process. It also supports the application of intelligent technologies in cultural heritage conservation, contributing to the sustainable preservation and utilization of cultural heritage data.

Keywords: cultural heritage digitalization, standards system, data lifecycle framework

1. Introduction

"Digital connectivity of cultural heritage is a growth engine driven by intrinsic resources, empowering the future"[1]. In recent years, the National Cultural Heritage Administration (NCHA) has continually advanced the cultural heritage digitalization. Together with other 12 departments including the Publicity Department of the CPC Central Committee, the NCHA issued the *Opinions on Strengthening Technological Innovation for Cultural Relics*[2], urging greater efforts in digitizing cultural heritage. As a result, cultural heritage institutions have accumulated a vast amount of digital resources and innovative practice cases, such as the "The Way in Patterns–An Immersive Digital Exhibition by the Palace Museum" and the "Digital Dunhuang Open Material Library".

Digitalization has opened up new possibilities for creatively conserving cultural heritage, breathing fresh life into these treasures, sparking renewed interest, and offering vital protection and strong support for their long-term preservation and sustainable use. On the one hand, data serves as a high-quality source of knowledge, acting as a core driving force for intelligent decision-making technologies such as large models. On the other hand, data is a key ingredient in new quality productive forces, unlocking significant value creation. In 2021, the General Office of the State Council issued the *14th Five-Year Plan for Cultural Relics Conservation and Technological Innovation*[3], which explicitly called for "the establishment of a standards system for cultural relic digitalization." In 2022, the NCHA released the *Guidelines for Cultural Relics Conservation Standard Project Approval in the 14th Five-Year Plan Period*[4], which emphasized the need to establish and improve the standards system for cultural heritage digitalization. This system aims to provide clear, science-based guidance for developing and updating standards, challenging the current situation of multiple discourse systems coexisting in the digitalization process of cultural heritage. It will streamline and standardize the technical and operational steps at every stage, boosting the management and use of cultural relic data resources and unlocking their full potential.

The standards for cultural heritage digitalization are

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crucial for ensuring data quality, consistency, and usability across various applications. These standards define workflows and requirements that enable precise recording, secure preservation, organized aggregation, and broad utilization of cultural heritage information. For practitioners, detailed operational procedures and guidelines facilitate understanding of digitalization norms, enhancing efficiency and minimizing errors that could potentially harm cultural heritage or compromise data integrity. Standardized data acquisition formats and cataloging protocols significantly reduce redundant efforts and human errors, ensuring the consistency and reliability of digital outputs. For researchers, high-quality, standardized data forms the foundation for in-depth studies. When analyzing 3D models of cultural heritage, the absence of uniform color correction and size calibration standards may hinder accurate comparative analyses, affecting the validity of scientific conclusions. Moreover, standardized data facilitates cross-institutional and interdisciplinary collaboration, promoting data sharing and integration. This interoperability is essential for leveraging artificial intelligence (AI) technologies to uncover patterns and insights, thereby supporting research in conservation, archaeology, history, art, and related fields. In summary, well-defined and standardized digitalization protocols are vital for the effective execution of digitalization projects, the preservation of cultural heritage, and the realization of the full potential of cultural data.

2. Methods of building the standards system for cultural heritage digitalization

The standards system for cultural heritage digitalization is designed to address existing challenges and guide future development by establishing a scalable and iterative framework. It lays out straightforward and well-defined standards for development and revision, offering an excellent solution to push the digitalization of cultural heritage forward in a consistent way. Constructing this standards system involves analyzing workflows, identifying key elements, and integrating these elements into a cohesive standardization framework.

The digitalization process for cultural heritage generally includes stages such as collection, processing, storage, transmission, and utilization of data. The corresponding standardization elements can be classified into metadata, controlled vocabularies, operational requirements, data quality, technical requirements, and management safeguards. However, in practice, storage and transmission often overlap or occur simultaneously with collection, processing, and utilization. The processing stage also involves a broader scope compared to collection and transmission stages. Relying only on a process-based classification can lead to issues such as overlapping content, fuzzy standard definitions, and an uneven distribution of standard projects.

To tackle these challenges, the standards system framework has been fine-tuned to match the lifecycle of cultural heritage data—from raw data to information, knowledge, intelligence, and application. So the framework is divided into six interconnected sections: general, data, information, knowledge, intelligence, and application. This paper uses a two-dimensional matrix analysis method[5] to evaluate the degree of overlap between standardization elements, assess their distribution across different sections, and ensure comprehensive coverage. The result is that the structure is logically sound, well-coordinated, and balanced.

3. Framework of the standards system for cultural heritage digitalization

Based on the research, key directions for standards development and revision have been identified for each section of the existing framework (see Figure 1).

3.1 General section

The general section provides a foundation for cultural heritage digitalization by standardizing core concepts and ensuring the security of digital workflows. The standards in this section cover areas such as terminologies, data preservation requirements, data recording guidelines, system design specifications, and data security protocols.

3.2 Data section

The data section aims to enhance the efficiency of data collection and improve the quality of raw data. It primarily cover three aspects: morphological data, audio data, and basic information of cultural heritage.

3.3 Information section

The information section governs the processing of raw data to generate refined datasets, primarily covering data extraction, content annotation, and visualization.

3.4 Knowledge section

The knowledge section focuses on establishing relationships between different types of cultural relic information, forming an interconnected knowledge network. It mainly covers two areas: data organization and management, and data association.

3.5 Intelligence section

The intelligence section focuses on transforming data into actionable insights and enabling decision-making through the application of AI tools. The standards in this section primarily encompass the use of domain-specific large models, internet-based monitoring, and knowledge derivation, with an emphasis on adopting advanced technical standards in the field of computer science.

3.6 Application section

The application section governs the transformation of data into outcomes, facilitating broader access to and exploration of data, and enabling innovative applications. It mainly addresses

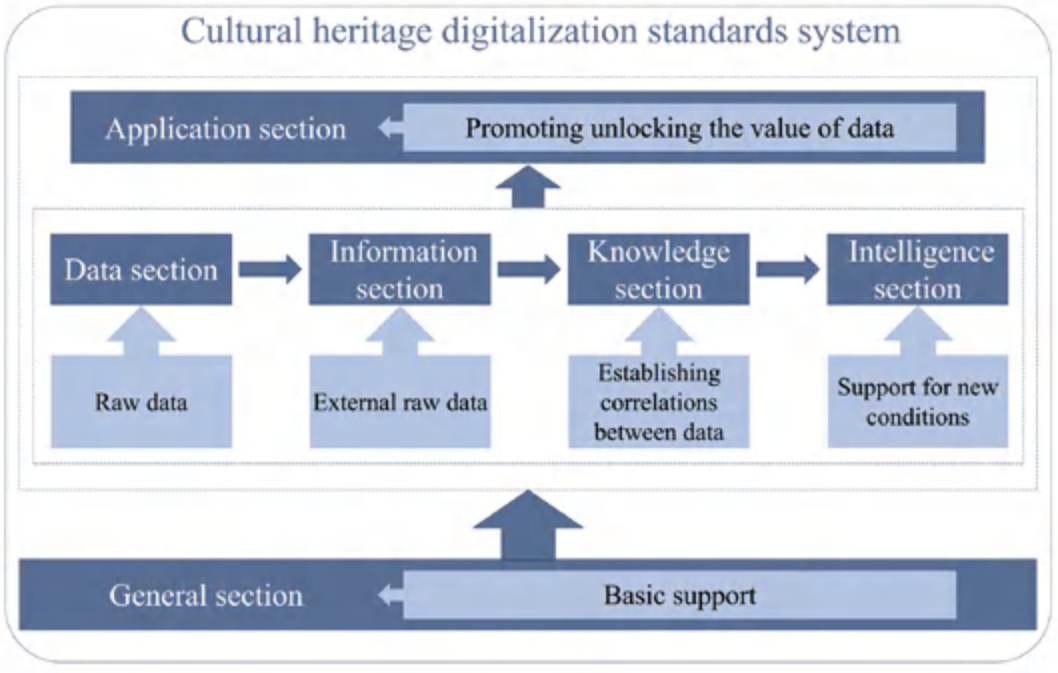

Figure 1: Logical diagram of the cultural heritage digitalization standards system

data circulation and utilization.

The refined standards system framework comprehensively encompasses all stages of the digitalization process, including collection, processing, storage, transmission, and utilization of data. It integrates sensory elements such as visual and auditory features, along with essential information about cultural heritage. The framework is thorough in scope, clearly defined, and logically structured, offering strong guidance and support for advancing the standardization of cultural heritage digitalization.

Currently, the digital preservation of cultural heritage is being widely implemented. Museums are increasingly focusing on the collection of two-dimensional and three-dimensional data to comprehensively capture the shape, color, and other attributes of cultural heritage. This approach aims to mitigate the risk of irreversible damage caused by various factors. Consequently, a series of sectoral standards have been developed and implemented to guide data acquisition processes. In 2023, the NCHA released several standards, including WW/T 0114-2023, *Two-dimensional digital acquisition and processing of movable cultural relics*. This standard outlines the workflow and technical requirements for the digital acquisition and processing of movable cultural relics, ensuring data quality and accuracy. It serves as a reference for museums across the country undertaking digitalization projects. Additionally, standards such as WW/T 0017-2013, *Specification for registration of cultural relics in the collection of cultural institutions*, define the metadata fields for cultural heritage records. These standards establish the foundation for constructing information resource catalogs, facilitating data retrieval and management. They also ensure consistency in the description of similar cultural heritages across different institutions, thereby promoting data linkage and sharing.

Despite these advancements, there remains a pressing need to develop additional standards. For instance, specific standards for the two-dimensional and three-dimensional digital acquisition and processing of various types of cultural heritages—such as ancient architecture, earthen sites, and significant modern historical sites—are yet to be fully established. Moreover, standards that address the integration of multimodal data of cultural heritage, the association of cultural heritage knowledge, and data exchange and sharing are essential for the comprehensive digitalization of cultural heritage. As technological capabilities and methodologies continue to evolve, it is anticipated that relevant standards will be developed to address these areas.

On the international front, the CIDOC Conceptual Reference Model (CRM), recognized as ISO 21127:2023, *Information and documentation—A reference ontology for the interchange of cultural heritage information*, serves as a global standard in the field of cultural heritage information. This model provides a unified framework for the organization and exchange of cultural heritage information, and has been widely adopted by institutions such as the University of Oxford. In China, organizations including the Palace Museum are actively incorporating this knowledge model to facilitate the global sharing of cultural heritage data. Given the variations in cultural relic characteristics, technological levels, and management systems across countries and regions, the direct adoption of foreign standards may lead to inconsistencies with China's specific context. A more feasible approach is to adopt these

standards equivalently—drawing on international best practices and standards while tailoring them to meet China's unique requirements and technological development levels. For example, by referencing the core concepts and interrelationships defined in the CIDOC CRM—such as the "artifact", "time", "place", and "creator"—China can design metadata standards and data exchange formats that enable semantic interoperability among different museums and types of cultural relic data.

4. Conclusion and outlook

The standards system for cultural heritage digitalization will be instrumental in bridging the digital divide and reducing disparities in digital access. By establishing unified data standards and shared service protocols, this standards system will connect foundational data across various aspects of cultural heritage preservation, promote the orderly sharing of cultural relic data, and foster collaborative innovation, ultimately contributing to the creation of a high-quality development framework.

Standards systems are inherently dynamic. As the collection and processing of cultural relic data continue to improve and digital technologies advance, the standards framework will require ongoing refinement and enhancement. The integration of cutting-edge technologies, such as AI and blockchain, into various aspects of cultural heritage preservation will further expand the application scenarios of cultural relic data. Consequently, data sharing and intelligent analysis are expected to become key focus areas in the future evolution of these standards.

Moreover, future standardization efforts will not only involve the continuous development and revision but also emphasize strengthening international collaboration and ensuring mutual recognition of standards. This will facilitate the global adoption and acknowledgment of China's cultural relic digitalization standards, contributing to the protection of humanity's shared cultural heritage.

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The voluntary national standard,

GB/T 11856.1-2025,

Quality requirements for spirits–Part 1:

Whisky,

was released by SAMR and SAC on January 24, 2025,
which will be implemented on February 1, 2026.

The standard will replace GB/T 11857-2008, and it refers to the relevant regulations and documents in countries and regions such as the US, Canada, the EU, Scotland and Ireland during the revision, which is also based on the actual production situation of whisky in China. It aims to standardize the quality requirements in the production, testing and sales of whisky.

GB 12955-2024, *Fire-resistant doorsets*

a new mandatory national standard of China, was released by SAMR and SAC on October 28, 2024, which will be implemented on May 1, 2026.

The standard will replace the 2008 version. It specifies the classification, code, size, model, technical requirements, testing methods, inspection rules, sign, packaging, transportation, storage and other aspects, which is applicable to the design, manufacturing and quality test of fire resistant doors for industrial and civil construction.

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