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# CHINA STANDARDIZATION

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**Spotlight**

The Second China Standardization Conference held in Quzhou
第二届中国标准化大会在衢州召开

**Special Report**

2024 International Standardization (Chilin) Forum convened in Nanjing
2024国际标准化（麒麟）大会在南京成功举办

**Exclusive Interview**

IEC President Jo Cops: Working together for an all-electric and connected society
携手共建全电互联社会
专访IEC主席 乔·科普斯

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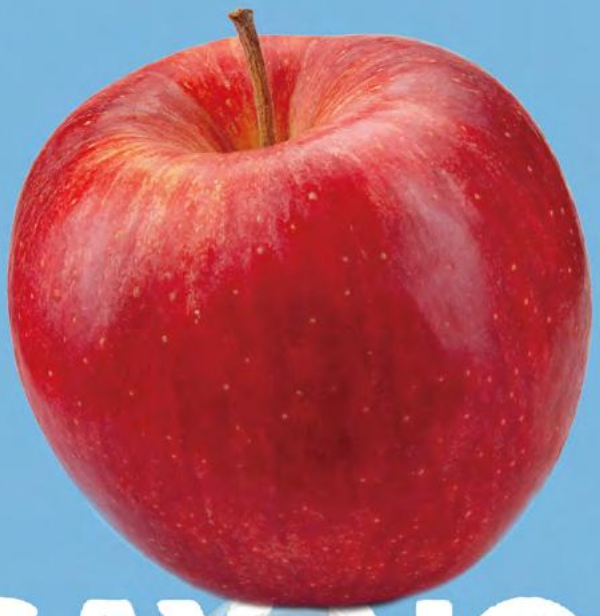

# SAY NO TO OVERPACKAGING!

Designed by China Standardization Press

Have you ever travelled to Nanjing, the ancient capital of six dynasties in China, with a history of more than 2,600 years?

The beautiful city well-known for its long history and delightful scenes welcomed international and domestic electrotechnology and standardization experts, who were gathered for the IEC Global Impact Fund Forum and 2024 International Standardization (Chilin) Forum on June 24-25. The two events provided good opportunities to discuss how IEC standards and conformity assessment systems can protect environment and boost economic growth, the digital empowerment and synergy between electricity and carbon, and how international standardization drives sustainable development.

“IEC standards and conformity assessment help countries to build up national infrastructure, achieving greater efficiencies while improving the safety of products, people and the environment with a firm commitment to creating positive change in people’s lives… The IEC Global Impact Fund aims to harness technical solutions and best practices that can help address some of the most urgent global issues, including climate change, energy access, and e-waste management,” said IEC President Jo Cops in the interview.

“As an important participant and active contributor to the IEC, China is willing to work with the international community to continue to play a key role in promoting global sustainable development through standardization,” said SAMR Vice Minister and SAC Administrator Tian Shihong at the IEC GIF Forum.

Another big event is the Second China Standardization Conference held in May by China Association for Standardization in Quzhou city, Southeast China’s Zhejiang province, which gathered officers and experts in the standardization field nationwide to discuss how to make standards play a bigger role in facilitating high-quality development.

Representatives shared the successful cases on standards development and application, and made exchanges on latest theoretical and practical progresses, attracting more than 1,300 participants on site and 20,000 audiences online. The SPOTLIGHT column presents you the highlights of the meeting, four parallel sessions, and keynote speeches.

Enjoy the magnificent feast in summer!

# *Summertime*

## *is always the best*

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# CONTENTS







HEADLINE |

# National guide on construction of standardization system for AI published

Artificial intelligence (AI) has become a vital driving force of a new round of technological revolution and industrial transformation, attracting global concern.

Recently, the *National Guide on the Construction of Comprehensive Standardization System for the Artificial Intelligence Industry (2024)* was jointly published by Ministry of Industry and Information Technology, Office of the Central Cyberspace Affairs Commission, National Development and Reform Commission, and Standardization Administration of China (SAC).

According to the Guide, by 2026, the linkage between China's standards and industrial technological innovation will be continuously improved, and more than 50 new national and sectoral standards will be developed, to speed up the establishment of the standards system to lead the high-quality development of AI. More than 1,000 companies will carry out standards publicity, implementation, and promotion, demonstrating the supporting role of standards in innovative development of enterprises. Moreover, China will participate in the development of over 20 relevant international standards to facilitate the global development of the AI industry.

The architecture of the AI standards system is composed of 7 parts, including standards on basic generality, basic support, key technologies, intelligent products and services, empowerment of new-type industrialization, industrial applications, and security/governance. The standards on key technologies mainly focus on AI generated texts, voices, and images, which also put forward technical requirements on human-machine hybrid enhanced intelligence, agents, cross-media intelligence, and embodied intelligence, to promote the innovation and application of AI technologies.

According to the Guide, standards technical bodies for AI will be established to promote greater synergy between industry, academia, research institute, and enterprise, and drive the construction of an advanced and applicable AI standards system with joint efforts. Special training projects will be held to educate standardization practitioners, cultivating a standardization talent team.

# Zhejiang releases local standard on operation of live streaming

Live streaming has become a vital means of e-commerce to attract consumers' attention and boost sales worldwide. Zhejiang province, one of the most economically active regions in China, pioneers the innovative forms and channels of e-commerce.

To better regulate the operation of live streaming, Zhejiang issued the local standard DB33/T 1385-2024, *Specification for operation of green e-commerce live-streaming room*, which is China's first standard in this field at the provincial level, and has come into effect since July 5.

As a giant of digital economy, Zhejiang has put efforts into empowering the development of live streaming. In 2023, green live-streaming rooms debuted in Zhejiang, setting a demonstrative example to regulate this sector through selecting models and echelon cultivation. By now, there are 174 green live-streaming rooms and 12 selected green live-streaming bases in Zhejiang.

DB33/T 1385-2024 summarizes Zhejiang's experience in cultivating green live-streaming rooms and provides replicable regulatory modes for live-streaming industry nationwide. It is expected to fill a gap in the sectoral regulatory system, and promote the beneficial development of new business forms of platform economy.

The standard defines the concept of green live-streaming rooms, which is expected to enhance healthy competition in the industry, improve quality and efficiency, promote consumption upgrading, advocate the healthy and eco-friendly lifestyle, and create a clean cyberspace.

# Three working groups on commercial aerospace established

In order to implement the spirits of the Central Economic Work Conference and systematically promote the standardization work of commercial aerospace, SAC/TC 425, *Space technology and operation*, recently established three working groups for emerging fields and strategic emerging industries related to commercial aerospace.

The work scope of WG 1 on commercial aircraft launching covers the standards research, development and revision for operation support, process, industrial chains, and other fields of launching. It is also responsible for the updating of standards documents published by correspondent international standardization organizations for further analysis and adoption.

WG 2 on the application of satellite internet is responsible for the research, development and revision of standards in areas such as the application scenarios and demands, functions and process, interfaces and data forms of satellite internet. Its first batch of members consists of 29 service providers, operators, equipment manufacturers, and parties representing public interests in this field.

WG 3 on space-based remote sensing services takes charge of standards research, development and revision on the service system, service support, mission planning, on-board processing, and end-to-end remote sensing services.

The national standards system on aerospace covers six aspects, including fundamental aerospace management, aerospace product assurance, aerospace system development, space data and information transmission, space security and sustainability, and aerospace services and application. The three new working groups are expected to effectively coordinate international standards, national standards and association standards, to fully exert the role of standardization in new technologies, services, and applications of aerospace, and boost the scientific, standardized, and high-quality development of commercial aerospace industry.

# Hubei Association Standardization Development Alliance set up


To implement the *National Standardization Development Outline* and Hubei's relevant supporting policies, the launching ceremony of Hubei Association Standardization Development Alliance was held in Wuhan, Hubei province on June 28, which was hosted by Hubei Institute of Standardization and Quality, and jointly held by Optics Valley of China and Hubei Optics Valley Standard Innovate Technology Co., Ltd.

The alliance was initiated by 94 units in Hubei, including research institutions, enterprises, industrial associations, and universities. The ceremony was attended by Yu Xinli, President of China Association for Standardization, Pan Niansong, Director-General of Hubei Medical Products Administration, Xu Qinxiang, Head of Standardization Division of Hubei Administration for Market Regulation, and representatives from members of the alliance.

Standardization work is an important basis to enable high-quality economic development, and the development and implementation of association standards can improve the technologies and market competitiveness of the industry, said Pan Niansong. He gave suggestions in the address: firstly, seize the opportunity to improve the quality of association standards; secondly, lead the industrial upgrading based on key advantageous industries and market demands; thirdly, expand the application scenarios of association standards to enhance the strength of the alliance.

The establishment of the alliance marks a milestone of association standardization work in Hubei, which gathers the strength of all parties. It is expected to guide Hubei's association standardization work, foster association standards developers, and enhance the influence and competitiveness of Hubei in the field of standardization.

# HIGHLIGHTS |

## Tian Shihong attends the 124th meeting of ISO Council

The 124th meeting of ISO Council was held on June 3-6 in Copenhagen, Denmark. The Chinese delegation attended the meeting, which was led by Tian Shihong, Vice Minister of SAMR and Administrator of SAC.

The attendees investigated policies on data protection, reviewed the work progress related to ISO's business mode and governance review, discussed key programs such as climate action and machine-readable standards, and elected the chair of ISO/COPOLCO, ISO's committee on consumer policy. During the workshop on enhancing the interaction of ISO Council and ISO Technical Management Board, Tian Shihong proposed suggestions on behalf of China, which were recognized by ISO Secretary-General and the participants.

The Chinese delegation also visited the Danish Standards, the national standardization body of Denmark. To deepen the standardization cooperation mechanism and improve international standards system in fields including digital economy and ports, the delegation held a few meetings with ISO Secretary-General and national standardization bodies of the U.K., the U.S., France, Germany, Sweden, Saudi Arabia, Malaysia, and other countries.

# Asia Pacific Regional Young Professional Campaign held in Shenzhen

Jointly supported by the Secretariat of IEC and SAC, the 2024 Asia Pacific Regional Young Professional (APRE YP) Campaign was successfully held in Shenzhen from June 25 to 30. The event was hosted by the Quality and Standards Academy, Shenzhen Technology University (SZTU), guided by the IEC Asia-Pacific Regional Center and the IEC Academy & Capacity Building.

The 6-day event included roundtable discussion, theme discussion, expert lectures, business practice, and other activities, which were participated by 27 young experts from Singapore, Malaysia, Thailand, Vietnam, Laos, Myanmar, Cambodia, Russia, and China.

The campaign was participated by Vimal Mahendru, IEC Vice-President and Chair of the Standardization Management Board, Dennis Chew, Director of IEC Asia-Pacific Regional Center, Ian Gardner, Head of IEC Academy & Capacity Building, David Nix, IEC Digital Transformation Officer, and other IEC officials. Also, authorities from the Standards Innovative Management Department of SAMR, SZTU, and Shenzhen Administration for Market Regulation attended the event, together with chairs of TCs in fields including electric transporting appliance, brain-computer interfaces, and medical equipment.

At the 2023 Qingdao Forum on International Standardization, Philippe Metzger, IEC Secretary-General, announced the IEC Statement on Support for Standardization Capacity Building in China, which set up the mechanism to select Chinese experts for the Young Professional Programme.

The 2024 APRE YP Campaign provides a platform for the communication and cooperation among young experts in the Asia-Pacific region, and promotes more young Chinese experts to actively participate in IEC international standardization activities and make contributions.

# HIGHLIGHTS |

## The 108th plenary meeting of IEC/TC 61 held in Hangzhou


Hosted by IEC, the 108th plenary meeting of IEC/TC 61 was held on June 3-7 in Hangzhou, Zhejiang province, which was supported by CHEARI Cixi Appliance Testing Service Co., Ltd., Zhejiang Tianxi Kitchen Appliance Co., Ltd., and Zhejiang Institute of Standardization. China Household Electric Appliance Research Institute (CHEARI) serves as the national mirror committee.

With a focus on the framework restructuring of IEC/TC 61 and dozens of proposals related to the IEC 60335 series, the meeting was attended by Liu Ting, President of CHEARI, Qu Zongfeng, Vice President of CHEARI, Tang Jianhui, Deputy Director of Standardization Division of Zhejiang Administration for Market Regulation, Irma Rustemi, Chair of IEC/TC 61, Ma Dejun, Vice Chair of IEC/TC 61, Randi Myers, Secretary of IEC/TC 61, Christophe Boyer, Technical Officer of IEC, and over 200 experts at home and abroad.

China has become the largest producer and trader of household appliances, striving to provide high-quality household appliances for global consumers through technological innovation. From adopting international standards to actively participating in international standardization work, the standardizers in China have contributed to the development and revision of international standards for household appliances, said Liu Ting.

The standards under discussion during the meeting involve a wide range of products, which play a key role in regulating global market order and promoting the development of household appliance products across the world. CHEARI has taken standardization work as the keystone of industrial development, and organized the industry to deeply participate in international standardization work, such as the development and revision of international standards and the management of IEC/TC 61.

## ISO/TC 344 on innovative logistics set up in Qingdao


The 2024 International Standardization Conference on Logistics, the first of its kind in China, was held by China Federation of Logistics & Purchasing (CFLP) on May 29 in Qingdao, Shandong province, where ISO/TC 344, *Innovative logistics*, was officially set up.

ISO President Sung Hwan Cho sent a congratulatory message via video. He Liming, Chair of CFLP, Zhao Shengcun, Deputy Mayor of Qingdao, officers from Standards Innovative Management Department of SAMR, and relevant leaders attended and addressed the meeting. Over 400 attendees participated in the conference, including representatives from the ISO Central Secretariat, members of ISO/TC 344, members of Asia-Pacific Logistics Federation (APLF), and representatives from national departments, industrial associations, research institutions, and logistics enterprises.

ISO/TC 344 is responsible for the standardization of services, technological application, and management in the field of logistics. Its secretariat is held by China, the domestic counterpart of which is CFLP.

ISO's vision is to make lives easier, safer and better, addressed Sung Hwan Cho in the video. He congratulated on the establishment of ISO/TC 344, which is a milestone in the development of excellent international standards for logistics. He further expressed his confidence in the contributions that would be made by the committee.

Themed "innovating logistics standards, connecting global trade", the conference was moderated by Cui Zhongfu, Vice Chair of CFLP, Executive Deputy Director of SAC/TC 269, and Chair of APLF. Guests gathered to exchange on international standardization development, innovative logistics development trends around the globe, green and low-carbon development of logistics enterprises, exploration and practice of intelligent logistics, and other aspects. Maho Takahashi, ISO Technical Programme Manager, Franck Lebeugle, AFNOR's Director of Standardization, Jong Kyoung Kim, Chair of Korea Society of Packaging Science & Technology, Roger Lee, Honorary Secretory-General of APLF, and several domestic experts shared their insights.

# 2024 International Standardization (Chilin) Forum convened in Nanjing

## 2024国际标准化（麒麟）大会在南京成功举办

Directed by International Electrotechnical Committee (IEC), German Commission for Electrical, Electronic & Information Technologies (DKE), and British Standards Institution (BSI), the 2024 International Standardization (Chilin) Forum was held at the IEC Promotion Center (Nanjing) on June 25 with the theme of "Digital empowerment and the synergy between electricity and carbon: International standardization driving sustainable development".

The forum was co-hosted by Nanjing Municipal Government, State Grid Corporation of China, China Huaneng Group Co., Ltd., and Chinese Society for Electrical Engineering. It was jointly held by China Three Gorges Corporation Association for Science and Technology, NARI Group Corporation, IEC Promotion Center (Nanjing), Nanjing Chilin Science and Technology Innovation Park, and Institute of Next Generation Power Systems and International Standards of Wuhan University.

The forum, founded in 2020, has been held for three consecutive years. Nearly 500 experts, scholars, and enterprise representatives at home and abroad got together to discuss international standardization work in areas such as digital technology, artificial intelligence, green energy, and product carbon footprints. They built consensus on cooperation, shared practical achievements, and jointly promoted the transformation of innovative technologies in digitalization, intelligence, electricity, and low carbon in the energy and power industry through international standards, contributing to the global sustainable development.

During the event, there were also lectures on international standardization, workshops on international standardization work, and an exhibition on digital and intelligent empowerment for electricity-carbon synergy, showcasing technological innovation and standardization achievements of enterprises. These activities provided a platform for companies to display their brand image, participate in international standardization work, connect with domestic and international innovation resources, and enhance business exchanges and cooperation.

## At the forum, a special event was moderated by Richard Schomberg, IEC Special Envoy, to release fruitful achievements.

The IEC and SAC Joint Statement of Support for the Chinese National Committee's IEC Promotion Center (Nanjing) to promote international standardization development was declared by Katharine Fraga, IEC Director of Membership, Affiliates & Capacity Building, and Guo Chenguang, Deputy Director-General of Standards Innovative Management Department of SAMR and Secretary of IEC National Committee of China.



Inauguration ceremony for the secretariat of IEC SyC SET on sustainable electrified transportation was held, and IEC International Standardization Training Base was established.

A multilateral cooperation agreement was signed by IEC Promotion Center (Nanjing), DKE and BSI. According to the agreement, joint research on emerging technologies in the low-carbon field will be carried out, and projects will be collaboratively planned to promote the development and implementation of international standards in the field. Also, standardization practical cooperation in product carbon footprints will be enhanced to facilitate the sharing of knowledge and experiences in greenhouse gas management. More activities will be organized to help realize the vision of a low-carbon all-electric society, such as seminars, demonstration projects, and international standards development.


IEC Societal and Technology Trend Reports were released. The report titled *Smart Sensing for Future Power Grids* was officially issued at the forum, along with two recently approved projects, Green Electrical Equipment as well as Application of Artificial Intelligence and Big Data in Power System, to develop new white papers.

Smart Sensing for Future Power Grids is IEC's first white paper on smart sensing technology, in which the experts from the IEC Promotion Center (Nanjing) have contributed the leading efforts. It delves into the development trends and technological pathways of digital power grids, covering multiple key areas including power generation, transmission, transformation, distribution, consumption, carbon emissions, and the integration of primary and secondary equipment. The white paper provides the layout for standards application of micro smart sensing technology in these fields and establishes a framework for international standards on future digital grid sensing technology.

It is the collective intelligence of 39 experts from 16 well-known enterprises, research institutes, and universities in countries such as China, Canada, Germany, and the United States. This achievement not only offers valuable suggestions and clear directions for the standardization of smart sensing technology, but also signifies IEC's proactive efforts in promoting relevant standards development. China has played a significant role in this process, and will actively mobilize experts to support the development of these standards.

**Domestic and international officers, experts, and enterprise representatives were invited to share their instructive insights, focusing on topics such as sustainable development, new quality productive forces, all-electric society, and new-type power grids.**

**Guo Chenguang**
Deputy Director-General of Standards Innovative Management Department of SAMR and Secretary of IEC National Committee of China

We are living in an open world. With the emerging of the Fourth Industrial Revolution, a connected global system with shared interests is taking shape. Standardization is of increasing significance in addressing challenges such as climate change and carbon emission, and providing solutions.

China has vigorously participated in the strategic plans of international standards organizations, and contributed to energy transformation for carbon neutrality, digital standards for zero-carbon electric power system, and other aspects. In addition to participating in the development of IEC white papers on multi-energy coupled power system, multiple solid waste to energy, and smart sensing for future power grids, China has been playing an active role in the development and promotion of IEC standards in the field of new energy.

To build a clean, low-carbon, safe, and efficient energy system, it is essential to grasp the key aspects of digital transformation and leverage international standards to promote the deep integration of electricity and carbon markets. It will facilitate the coordinated development of digitalization and low-carbon transformation in the energy and power industry. China is willing to work with countries around the world to deepen standardization cooperation, enhance exchanges and mutual learning, and jointly improve the international standardization system to promote sustainable development through standards.

Countries around the world are building their power system with clean energy as the main body. The new-type industrial system for energy technology centering on clean electricity production and consumption has become the key to development.

China's exports of "new trio" represented by electric vehicles, lithium batteries, and photovoltaic products reached 1.06 trillion yuan in 2023. Therefore, the accuracy of carbon footprints raised concern, which affects the accounting of carbon emissions.

Establishing the standards and certification system for product carbon footprints based on time and region division helps ensure the integrity, authenticity, and transparency of power traceability, which not only facilitates domestic industrial upgrading as well as investment and consumption of clean energy, but also promotes Chinese products to go global.


**Shu Yinbiao**
36th IEC President, Academician of Chinese Academy of Engineering, and President of Chinese Society for Electrical Engineering

**Vimal Mahendru**
IEC Vice President and Chair of the Standardization Management Board

The UN Sustainable Development Goals (SDGs) are important promises that governments of 196 countries made to all their citizens in 2015. These are the fundamental needs of our society.

The UN SDGs actually address three fundamental basis of life on earth. The basic layer is the biosphere of earth, related to land, water, and air. The second layer is society, and the third is the layer of economy. That is to say, if we want the enterprise layer succeeds, we have to make sure that society also succeeds and the earth remains sustainable. If there is an imbalance, the structure will topple.

At the heart of IEC's work on sustainability, it is about technologies, rather than policies, regulations or something else. Sustainability technologies bring societal well-being by the evolution towards a cleaner, more efficient energy landscape, combating climate change while enhancing environment sustainability, circularity, economic prosperity, and access to energy for all. IEC has developed many standards towards circular economy, covering the processes of design, sourcing, assessment and procurement, use, re-furbishing, remanufacturing, disposal and recovery, re-use parts, and recycling, which include IEC 62430, IEC TS 62824, IEC 63333, IEC 62474, ISO/IEC 82474-1, IEC 62321, and IEC CDV 63366.

The climate change is a global issue, not a national issue. The only way to address global issues is to work across all nations. That is why the IEC is a critical collaboration platform where we can work together to come up with ideas that everyone across the world can use.

The State Grid Corporation of China is committed to promoting the clean and low-carbon transformation of energy. It attaches great importance to the coordinated development of technological innovation and standardization, and has achieved many successes.

The State Grid will uphold openness and cooperation, focus on key areas such as electricity-carbon synergy, continuously strengthen its capability for innovation in standards, accelerate the transformation of technological achievements into international standards. Also, catering to the goals of carbon peak and neutrality, as well as the needs to build new power system, the State Grid will expedite the development of a series of international standards in the fields of energy conservation and environmental protection, and further enhance exchanges and cooperation with international peers in the field of standards under international mechanisms such as the IEC.

**Meng Qingqiang**
Chief Engineer of State Grid Corporation of China

**Zhang Tao**
Vice President of China Huaneng Group Co., Ltd.

The integration of the digital revolution and the energy revolution is a prevailing trend and an inevitable choice to promote green, low-carbon, and digital transformation of enterprises. China Huaneng takes the green and low-carbon transition as a strategic task for high-quality development, and considers the implementation of ESG principles as an important part of the company's strategy. By actively participating in the division of labor and cooperation in global energy industry, China Huaneng is committed to fulfilling its social responsibilities globally and addressing climate change.

It will vigorously promote the construction of new power systems, and focus on expanding cooperation with international standards organizations such as the IEC, to facilitate the development of more international standards in the energy and power sector. By using international standards to support its global brand strategy, China Huaneng aims to become the world's first-class brand.

编译/方洛凡

(Edited and translated by Fang Luofan based on the speeches)


# IEC standards and conformity assessment facilitate environmental and economic development

## The IEC Global Impact Fund Forum held in Nanjing

## IEC标准与合格评定促进环境和经济发展

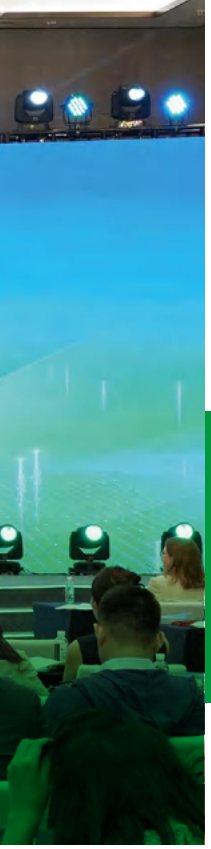
## IEC全球影响力基金项目研讨会在南京召开

*By Cao Xinxin*
文/曹欣欣

To discuss solutions for the global challenge on environmental, social and governance (ESG), and promote the IEC Global Impact Fund (GIF), the IEC Global Impact Fund Forum was held in hybrid forms in Nanjing city, Jiangsu province, China on June 24.

The event was addressed by Jo Cops, IEC President, Tian Shihong, SAMR Vice Minister, SAC Administrator and President of IEC National Committee of China, and Shu Yinbiao, 36th IEC President and Academician of Chinese Academy of Engineering. It was attended by Vimal Mahendru, IEC Vice President and Chair of Standardization Management Board, Richard Schomberg, IEC Special Envoy on Smart Energy, Matthew Doherty, IEC GIF Senior Advisor, and Jinseok Bae, Korean Agency for Technology and Standards (KATS) Liaison Officer to IEC.

The forum, hosted by IEC GIF and jointly organized by IEC Promotion Center (Nanjing), China Huaneng Group Co., Ltd., China Southern Power Grid, and Huawei Technologies Co., Ltd., attracted more than 200 participants on site. Officers, experts and enterprise representatives delivered keynote speeches on themes such as KATS activities for IEC GIF, ESG management model, and how to mobilize private capital through ESG data standardization and disclosure. A discussion panel was held to discuss how IEC international standards and conformity assessment can have a catalytic impact on environment and economy.






**Jo Cops** said in the address that electricity is the cornerstone supporting technological innovation and social and economic development, whose importance has been increasingly recognized. Reliable electricity supply is crucial for basic services such as education and healthcare.

After sharing practical cases in various regions of the world, he said that the IEC GIF, by seeking projects and partners capable of making a difference, helps address the most pressing global issues such as climate change, energy production and supply, and waste disposal, aiming to bring positive changes to people's daily lives. Currently, the IEC GIF is making an impact in many regions, such as Africa. The IEC hoped that infrastructure will be improved and energy supply will be promoted through deeper and broader exchanges and cooperation, to foster global trade development and knowledge sharing.

**Tian Shihong** said in the address, international standards are the important technical foundation for the global governance system and the economic and trade cooperation. It has become an international consensus that international standards can address many challenges including global climate change. As an important participant and active contributor to the IEC, China is willing to work with the international community to continue to play a key role in promoting global sustainable development through standardization. China aims to deepen standardization cooperation, strengthen exchanges and mutual learning, and advance the construction of an international standards system for carbon emissions, contributing wisdom to the global green and low-carbon transition and the implementation of the United Nations 2030 Agenda for Sustainable Development.

The IEC GIF, through solutions such as technologies, international standards, conformity assessment, and national quality infrastructure, can effectively resolve the current problems and challenges related to ESG. It is essential to leverage the platform and resource advantages of the IEC GIF to provide project funding to developing countries and carry out standardization work related to climate change and environmental protection. This will provide fundamental momentum for the construction of a digital all-electric society.

According to **Shu Yinbiao**, the IEC has actively engaged in the research, development, and promotion of international ESG standards, aiming to achieve low-carbon energy production and

facilitate green certification. This provides effective means to innovate global green and low-carbon technologies and meet the requirements of green trade regulations. Currently, Chinese experts are actively participating in the IEC strategic plan, incorporating carbon neutrality, energy transition and other themes into the plan. They are leading the development of white papers of emerging strategic technologies including zero-carbon power systems, and promoting the development of international standards in areas such as virtual power plants, grid sensing, and smart hydropower.

IEC international standards have significantly driven the upgrading and transformation of Chinese industries towards high-end, intelligent, and green development. He suggested promoting and applying IEC international standards actively to tackle global challenges. Additionally, contributing to the IEC GIF to share global ESG best practices and strengthening technical standards cooperation of regions across the globe will help establish a green, low-carbon, fair, and friendly global technical standards system.

**Two new partners**

Two new Chinese partners of the IEC GIF announced at the Forum were NARI Group Corporation and China Electric Power Equipment and Technology Co., Ltd. (CET). They will join forces with the IEC GIF to promote the application of IEC standards and conformity assessment in overseas projects.

The IEC GIF and the IEC Promotion Center (Nanjing) will collaborate with NARI and CET on energy projects in emerging markets and developing economies in Africa, Southeast Asia and other regions. They will also seek collaboration with financial institutions including the World Bank, Asian Development Bank, and African Development Bank to improve electricity consumption, critical infrastructure and institutional governance.

# About the IEC Global Impact Fund

The IEC Global Impact Fund (GIF) was officially launched in 2022, with the then IEC President Shu Yinbiao as one of the initiators. Aiming to advance the IEC vision of creating a safer, more efficient world, the IEC GIF provides grants for projects that address specific global ESG challenges through the application of IEC international standards and conformity assessment systems. The IEC GIF projects target countries where effective, safe, and efficient solutions based on IEC technical know-how can be implemented by small and medium enterprises (SMEs).

The IEC GIF is funded through donations from the public and private sectors in addition to the contributions from IEC. The fund is initially supported through a three-year annual contribution of 1% of the IEC Capital & Reserves over the 2023-2025 pilot phase, and it is expected to be self-sustaining at the end of the pilot phase.

The IEC GIF's operations and activities are based on a "3P" approach: policy, partnerships and projects. Partnerships play a key role in the success and sustainability of organizations, and the IEC GIF has developed a robust partnership framework to guide its collaboration efforts.

There are four types of partners: implementing partners, knowledge partners, enabling partners, and financing partners. Korean Agency for Technology and Standards (KATS) is the first financing partner of the fund.

The first project of the IEC GIF, *Catalyzing innovation for circular models in Africa–turning battery e-waste into e-resources*, will support an SME-led project in Africa to promote sustainable battery e-waste management. The main implementing partner of the project is Differ Community Power (DCP), an international provider of solar energy services to communities. The project will determine the feasibility of using second life lithium batteries to rehabilitate solar PV installations at critical locations such as schools, health centers and hospitals in Kenya.


# Working together for an all-electric and connected society

## Interview with IEC President Jo Cops

# 携手共建全电互联社会

## 专访IEC主席 乔·科普斯

**During the IEC Global Impact Fund Forum held in June in Nanjing, China, we interviewed IEC President Jo Cops. He shared his views about how standards and technologies are addressing global challenges and facilitating the UN Sustainable Development Goals (SDGs). Mr. Cops also discussed the progress of the new IEC Global Impact Fund, as well as the future work of IEC.**

**Before becoming IEC President, you led the Belgian National Committee of the IEC for almost 10 years. Would you like to share your opinions on how IEC standards and conformity assessment help solve global challenges?**

**Jo Cops:** IEC international standards and conformity assessment systems are important because the global challenges that we are facing have no borders. The way we are organized to develop international standards is through national committees. IEC has technical committees with a specific working scope, focusing on specific areas. And on the national level, there are mirror committees. This is how we develop international standards.

We think that through standards development and conformity assessment systems, IEC can contribute to achieving the UN Sustainable Development Goals (SDGs). For instance, IEC has approximately 160 technical committees (TCs) and four conformity assessment systems working on SDG 7, which is about ensuring access to affordable, reliable, sustainable and modern energy for all. Examples of how we contribute towards realizing SDG 7 include our work on low-voltage direct current (LVDC), microgrids, energy efficiency, renewable electricity, and so on. You'll find plenty of examples of how we contribute to the other SDGs on the IEC website: **https://www.iec.ch/sdgs**.

**The IEC Global Impact Fund (IEC GIF) is designed specifically to further encourage standards-based solutions to support the SDGs. It also contributes to the IEC vision of an all-electric and connected society. Can you explain how IEC GIF facilitates achieving the SDGs and aims to help bridge the digital divide?**

Energy access is a challenge. About 700 million people still don't have access to electricity. We exclude far too many from the digital and all-electric future. I believe that access to electricity should be a human right. There is no access to the internet or the other conveniences of modern life without electricity.

IEC standards and conformity assessment help countries to build up national infrastructure, achieving greater efficiencies while improving the safety of products, people and the environment with a firm commitment to creating positive change in people's lives. The IEC GIF actively seeks out projects and partnerships that deliver real-world impact. It aims to harness technical solutions and best practices that can help address some of the most urgent global issues, including climate change, energy access and e-waste management. It will do this by leveraging international standards and conformity assessment to provide practical solutions based on best practices and reached by global consensus.

We recently launched the first IEC GIF project. The project, in rural Kenya, is helping schools and hospitals gain increased access to electricity by turning old batteries into new resources. The schools and hospitals are in remote areas, too far away from the grid.

**You served as the IEC Treasurer for 5 years. Can you explain how IEC GIF works?**

Holding the position of Treasurer gave me a lot of insight, not just into the finances, but also into the way IEC works and is organized.

There was an idea to use 1% of the reserves to help realize specific environmental, social and governance (ESG) goals. This idea has grown into the IEC Global Impact Fund. Now, in order to further develop the IEC GIF, we are looking for partners that can help us finance even more ambitious projects. They can come from industry, but can also be governments or other organizations that are willing to support our initiative.

**Given your distinguished career in industry, what role do you think businesses can play in the IEC GIF?**

Industry is a very important stakeholder in IEC. Most of the experts who participate in IEC technical work come from industry and we already have a good relationship that we can build on. We can also help businesses to have more impact with their philanthropic efforts.

Let me give you an example. When I recently visited the first GIF project, in Africa, the headmaster in a primary school told me that several companies had sponsored them and donated products like computers and video projectors. He said, that is very generous, but unfortunately, the school doesn't have electricity!


Jo Cops delivers a speech at the IEC Global Impact Fund Forum held in Nanjing city, Jiangsu province, China in June 2024.

Jo Cops accepts the exclusive interview from China Standardization Press during the Forum.

**Standardization has attracted increasing global attention. Increasingly, international standards and conformity assessment are being seen as solutions to many common challenges. What will be the focus of IEC in the near future?**

We have seen that technology is becoming more and more important in our lives. International standards ensure that it is safe, efficient and does what it is supposed to do.

Legislators use our standards because our work represents a global consensus on solutions to various issues. We offer strategic answers for businesses to decrease costs, increase productivity, access new markets and facilitate freer and fairer global trade. Moreover, the core principles guiding the development of IEC international standards—openness, transparency, effectiveness, relevance, stakeholder engagement and consensus—reflect good governance and policy-making practices.

The IEC brand also ensures reliability and fosters trust, which is crucial for public confidence in policy.

**Governments refer to standards because they know they are updated regularly. It is much easier to cite a standard than to create a law from scratch. Therefore, conversations between international standards organizations and governments are gaining importance.**

The rapid development of technology means that ever more standards are needed. In recent years, we have been active in domains such as AI and cyber security. We have begun work in areas such as bio-digital convergence and the metaverse. We recently established a new IEC/ISO joint technical committee on quantum technologies, including quantum computing. It is a good example of how we start relatively early to facilitate the emergence of new technologies by providing a common vocabulary. This facilitates a smoother transition and integration of these technologies into the global market, by ensuring that everyone speaks the same technical language.


Jo Cops shares his views about how IEC standards and conformity assessment systems can have a catalytic impact on local environments and economies at the Forum in June 2024.

**How can China support the work of IEC?**

On the technical side, China has a big industrial market with many consumers and experts, who are already participating in the work of IEC. Since the number of domains is growing, we will always need more experts to strive for what we are doing within the IEC. China is already making a significant contribution and can continue to do so.

China can also contribute more on the governance side, participating more in the governance structures of the IEC.

**The IEC Promotion Center (Nanjing) was established nearly two years ago. Could you comment on the work of the center?**

I am very impressed by the work that is being done here. It is incredible. This is my first time here, but I definitely will come back. There is so much going on here to promote the valuable work of the IEC. You can count on my personal support.

## About Jo Cops

Mr. Cops became IEC President on January 1, 2023, for a three-year term. Prior to that, he served as Treasurer of IEC from 2018 to 2022. He led the Belgian Electrotechnical Committee (CEB-BEC) as the Secretary-General from 2012 to August 2021.

Mr. Cops has a master's degree in engineering and has had a distinguished career in industry. He was the Director of Industry Relations at Niko, a European leader in smart home solutions. He began his career with Sony Belgium and subsequently held various management positions within Sony Europe, followed by senior positions at Telenet (Liberty Global) and Alpha Technologies Europe.


# KATS

## the first financing partner of IEC GIF, takes the lead in resolving global challenges

### Interview with Ph.D. Jinseok Bae, KATS Liaison Officer to IEC Global Impact Fund

## IEC全球影响力基金首个融资合作伙伴 韩国技术标准局（KATS）积极应对全球挑战

### 专访KATS驻IEC联络官员 裵珍奭博士

**Can you please briefly introduce the Korean Agency for Technology and Standards (KATS) and the Korean standards system?**

**Ph.D. Jinseok Bae:** KATS is a government agency in Korea responsible for national standardization, product safety management, conformity assessment infrastructure, and technical regulation management. KATS consists of 4 Bureaus (Bureau of Standards Policy, Bureau of Product Safety Policy, Bureau of Conformity Policy, and Bureau of Technical Barriers to Trade Affairs) and 21 Divisions and serves as the National Committee (NC) secretariat for both IEC and ISO.

Korea operates a legal national standards system based on the *Constitution of the Republic of Korea*. The standardization system by law is shown in the following figure.

So far, KATS has participated in a total of 217 IEC Technical Committees and Subcommittees (115 TCs and 102 SCs). Korea has held secretariats of 8 TCs/SCs, and Korean experts have assumed Chairs of 7 TCs/SCs and 72 WG Convenors.

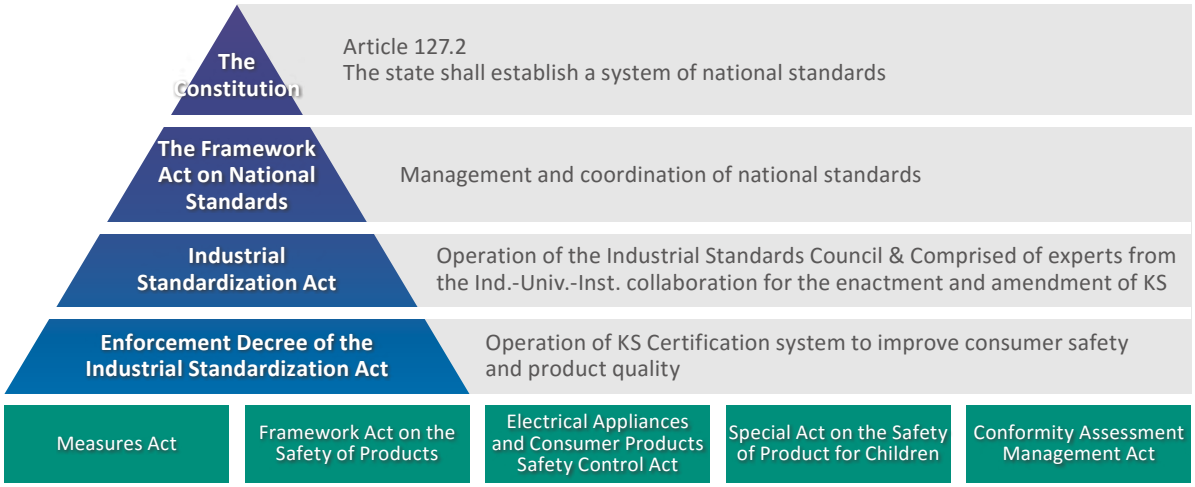



Figure 1: The standardization system of South Korea

**KATS is the first financing partner of the IEC Global Impact Fund (GIF). Why does KATS think the participation of the IEC GIF is so important?**

So far, KATS's activities at the IEC have mainly focused on representing Korea's interests similar to a general IEC member body.

However, with the launch of the IEC GIF in March 2022, we believe that KATS now has an opportunity to contribute to the international community through the IEC. This aligns with the current Korean government's value of, "It is time for Korea, as a responsible member of the international community, to take the lead in resolving the challenges facing humanity."

On March 13, 2024, KATS signed the contract and became the first financing partner of the IEC GIF.

**How does KATS participate in the IEC GIF?**

KATS has taken three approaches. First, KATS provides financial support to the IEC GIF. Second, KATS is trying to find how to utilize the standards developed by the IEC GIF. Third, KATS wants to give Korean SMEs, which already have the excellent standard technologies, the opportunity to share globally by participating in the next IEC GIF pilot project.

Through these activities, KATS has become a financing and enabling partner now. And KATS is looking forward to eventually being able to serve as a knowledge partner.

**What experience has been gained through the participation? What is the future plan?**

We realized that there are still many areas in the world that need IEC standards and conformity assessment systems. KATS plans to continue to support the IEC GIF activities and achievements, and analyze the effectiveness of Korean GIF activities.


Ph.D. Jinseok Bae delivers a keynote speech at the IEC Global Impact Fund Forum held in Nanjing city, Jiangsu province, China in June 2024.

Also, KATS helps Korean SMEs actively participate in the next IEC GIF projects.

**How does KATS promote the understanding and use of IEC standards in South Korea?**

KATS continues to hold seminars and workshops in which all stakeholders in Korea participate. Additionally, KATS implements a standardized curriculum from elementary school to graduate school. In addition, KATS communicates with Korean customers through existing promotional channels such as broadcasting and newspapers, as well as various ICT communication channels such as SNS and Youtube.

KATS is promoting the harmonization of IEC standards with Korea's national standards and recommending various stakeholders, including regulatory authorities, to use national standards that have harmonized IEC standards.

## About Ph.D. Jinseok Bae

As an expert in the field of electrical, electronic, and information standards at KATS for over 20 years, Ph.D. Jinseok Bae participated in actual standardization development work such as IEC, ISO, ITU-T, and IEEE.

Based on that experience, he served as head of the Metrology and Measurement Division and the Electrical, Electronics and Information Standards Division at KATS. He is currently the KATS Liaison Officer to IEC GIF, where he has a keen interest in IEC's standardization policy for emerging technologies such as AI, quantum technology and metaverse, as well as "IEC GIF activities" for international community contribution.

# The Second China Standardization Conference held in Quzhou

## 标准引领 推动高质量发展
## 第二届中国标准化大会在浙江衢州召开

*By Jin Jili*
文/靳吉丽

The Second China Standardization Conference was held in Quzhou city, Zhejiang province, on May 22-23, 2024, which was hosted by China Association for Standardization (CAS).

The conference was presided over by Zhang Xiuchun, Secretary General of CAS, and addressed by Xu Zhangyan, Mayor of Quzhou, and Li Yaowu, Deputy Secretary-General of Zhejiang Provincial People's Government, and Yu Xinli, President of CAS.

The conference was attended by more than 1,300 participants on site including renowned experts and scholars on standardization, leaders of research institutes, heads of standards technical management, and representatives of enterprises at home and abroad, and watched by over 20,000 audiences on line.

Centering on the theme of "Promoting the leading role of standards in high-quality development", the event was composed of one main session, seven parallel sessions as well as activities such as visits and exhibitions.

During the main session, more than 10 leading standardization experts and scholars shared their insights into the strategic layout and policy orientation of national standardization cause. They introduced the new achievements and practices in the areas such as digitalization of standards, new quality productive forces, green and low-carbon development, artificial intelligence (AI), and association standards development.

They also discussed how to exert the fundamental and leading role of standardization in supporting the economic and social development, and promote China's high-quality development with high standards.

The parallel sessions respectively focused on the institutional opening up of standards, association standards, marine standardization, environmental, social and governance (ESG), government service standardization, robot standardization, as well as certification and testing standardization.

Participants shared the successful cases on standardization, and exchanged on theoretical achievements and practical experience, aiming to find the best standardization solutions together.

# Thoughts on the development of association standards

**Zhao Xiangeng**
Former Vice President and Academician of Chinese Academy of Engineering

The *National Standardization Development Outline* puts forward the establishment of a binary standards system composed of government-led standards and market-oriented standards, which refer to national standards and association standards respectively.

National standards meet basic demands, safeguard the bottom line and ensure safety, which are derived from the macroeconomic governance system. And association standards have the characteristic of promoting advancement, innovation and competition, which are actually the outcomes of the market economy.

**Development of association standards**

The development of association standards in China can be divided into five phases. The first phase is from the proposal of association standards to the year of 2015. The second phase is from 2015 to 2018. The revised *Standardization Law of China*, put into effect since 2018, granted the official legal status to association standards. The third phase is from 2018 to 2025 with the booming development of association standards. The fourth phase is from 2025 to 2035, when they will be better governed and branded. The fifth phase is after 2035, when they will be advanced at the international level.

Association standards can facilitate high-tech innovation, lead high-end industries, support high-efficient governance, promote high-level opening up, and ensure high-quality life. Progress has been made in the building of the binary standards system, in which the two kinds of standards coordinate, support and complement each other.

**Problems and suggestions**

The problems in the development include insufficient and unbalanced standardization capabilities of social organizations, and not enough application of association standards, and inadequate capability in the internationalization of social organizations.

Suggestions are given as follows: firstly, exert the role of the government in guiding and regulating association standards; secondly, carry out the action on improving the capabilities of social organizations; thirdly, select excellent association standards by well exerting the role of the government; fourthly, give play to the innovative and leading role of association standards in establishing the national quality infrastructure system; fifthly, drive social organizations to play a role in the internalization of standards.

# Higher opening up contributes to high-quality development

**Fu Wenbiao**
First-level Inspector of Standards Innovative Management Department, SAMR

At present, various international and regional professional organizations collaborate, compete, and evolve with the three international standards organizations including ISO, IEC, and ITU, which also undergo new changes in terms of participants, development processes, and development of international standards themselves. In many countries and regions, standardization is raised to the national strategic level. International standards are more closely related with technical progresses, industrial development, social governance and international trade.

**Status and challenges of the internationalization of standards**

In recent years, SAC has actively participated in the activities of ISO and IEC, contributing Chinese wisdom to their strategic planning and governance reform. SAC has kept good cooperation with regional organizations, and established fixed cooperation mechanisms with countries such as Russia. It has issued two rounds of the *Action Plan on Belt and Road Standard Connectivity* successively for six years, and signed 109 cooperation agreements with 67 countries. So far, the foreign language versions of over 1,900 national standards were released, providing support for international trade facilitation as well as international cooperation and communication.

The international development of standards is confronted with double challenges. As for external challenges, the participation ways of international standardization activities have witnessed profound changes. International standards face more intense competition, especially in emerging and key technological areas. In China, there are still some gaps in terms of key information technologies such as AI. Other internal challenges include inadequate technical capabilities, a lack of personnel and resources, and level of enterprises' participation to be promoted.

**Thoughts on expanding the institutional opening up of standards**

Some suggestions are given as follows: firstly, promote the internationalization of standards in a coordinated manner; secondly, actively participate in the activities of international standards organizations; thirdly, continuously deepen the international cooperation on standardization; fourthly, vigorously promote the compatibility of domestic and foreign standards systems; fifthly, actively push forward the international standardization work in all respects; sixthly, establish a high-level standardization talent team.

# International standards facilitate new quality productive forces

**Shu Yinbiao**
36th President of IEC and Academician of Chinese Academy of Engineering

**Role of international standards in new quality productive forces**

China is an important participant and contributor of international standards. So far, 91 Chinese experts have assumed chairs or vice chairs in ISO and IEC technical bodies, and 94 secretariats have been held by SAC. There are more than 10,000 registered experts on international standards. The number of international standards developed with China's leading efforts have increased from 155 in 2012 to 1,362 in 2023. The evaluation results of IEC Council Board in 2022 showed that China was the second largest contributor to the international standardization in IEC.

International standards promote China's technical equipment to go global. In 2005, China launched the R&D of UHV technology, synchronously promoted technical standards and standards internationalization, and established IEC/TC 115 and IEC/TC 122 on HVDC transmission and UHV AC transmission respectively.

International standards support the rapid development of emerging industries in China. In 2023, the exports of the "new trio", namely electric vehicles, lithium batteries, and photovoltaic products, reached 1.06 trillion yuan. The production and sales of new energy vehicles exceeded 9 million units, accounting for two thirds of the global production and sales.

International standards can address the global climate change. Chinese experts have actively participated in the strategic plans of IEC and ISO. By doing so, they included the topics such as energy transition and carbon neutrality in IEC strategic plans, launched the IEC Global Impact Fund, and established the global carbon standards system, contributing Chinese wisdom to the global green and low-carbon transition to address the climate change.

**More efforts to facilitate new quality productive forces**

To better exert the role of international standards in facilitating new quality productive forces, more efforts should be made. Firstly, raise the standardization awareness of enterprises, and actively participate in the work of international standards organizations. Secondly, promote international standards and conformity assessment, and facilitate the new-quality and intelligent development of industrial chains. Thirdly, enhance the cooperation on international standards in the area of green and low-carbon development.

# Standardization leads the innovative development of CHINT

**Nan Cunhui**
Chair of the Board of CHINT Group

Established for nearly 40 years, CHINT Group has always adhered to the principles of integrating standardization and scientific and technological innovation, which has developed more than 500 domestic and international standards with leading efforts. Its standardization practices are showed in four aspects.

**Firstly, standardization leads high-quality development.** CHINT has drafted many sectoral standards for intelligent universal circuit breakers and other products and the association standard on high-impedance power transformer, filling the gap in mandatory national standards that lack new energy efficiency indexes. Its experiment station has covered the experiment standards systems of China, the U.S. and the European Union. The company has set up the standards innovation award to support the development of relevant technical standards and cultivate interdisciplinary standardization talents.

**Secondly, standardization leads digital development.** The intelligent manufacturing factory of low-voltage electric appliances in CHINT was awarded the national pilot and demonstration factory of intelligent manufacturing in 2021. Its pilot project was included in the third batch of the list of national standardization pilot projects on high-end equipment manufacturing. The manufacturing standards and models of the future factory, featuring the industrial brain as well as intelligent, green and near zero carbon emissions, has led the digital development of intelligent electric industry.

**Thirdly, standardization leads green development.** CHNIT has established more than 700 photovoltaic power stations and 1.5 million residential photovoltaic power systems across the world. It has participated in the development of a series of national and international standards such as the specification for design of photovoltaic power stations, and the drafting of the first local standard on residential photovoltaic power system with leading efforts. It has also cooperated with the Standardization Technical Committee of China Photovoltaic Industry Association to promote the development of related sectoral standards.

**Fourthly, standardization leads the development of new quality productive forces.** To address bottleneck problems, CHINT has promoted the application of chips and module equipment through industrial chains. After 10 years of exploration, it has successfully developed new materials of graphene alloy with high conductivity at room temperature, and made many innovative achievements for industrial application including more than 60 patents for inventions.

# Development trends of the digitalization of standards

**Zhang Xiaogang**
Former President of ISO

In traditional understanding, products come first, which are followed by standards and industrialization. This is because products are the best proof of the possibility, feasibility and availability of technologies. A recent new trend shows that standards can come first. Traditional industries pay more attention to standards' function of trade rules, while emerging industries focus on the driving forces of standards in leading innovation, due to the rapid technical iteration of digital technologies.

It is clear that in the next 10 years, digital technologies will overturn the business models of all industries and the paradigm of technical innovation in traditional manufacturing. The superiority of AI to human intelligence will occur in more areas.

**Development and challenges of the digitalization of standards**

Early in 2006, Finland raised the concept of open standards for the first time, which was the early form of the digitalization of standards. Ten years ago, advanced countries and the three international standards organizations began to discuss the digitalization of standards. About five or six years ago, they included the digitalization of standards in their development strategies successively. In China, a standardization working group on digitalization of standards was established in January 2023.

ChatGPT and Sora are capable of generating texts, videos, audios, photos and pictures, which means that the digitalization of standards can be achieved. If artificial general intelligence (AGI) succeed within five years, it will not only overturn the digitalization of standards, but also put forward the intelligence of standards. It will lead to self-evolving standards.

**Considerations for future development**

Firstly, discard traditional ways of technical innovation. We should break the conventional mode of introducing and learning from latest technologies, and think independent and disruptive innovation. Secondly, change the organizational mode. Only if multidisciplinary experts get together can we succeed. Thirdly, let go of traditional ways of behaving. We should walk out a road featuring the standardization of technologies, industrialization of standards, and internationalization of industries.

# Standardization: The engine that boosts new quality productive forces

**Zhang Gang**
Former Counsellor of the State Council and Member of the Strategy Consultancy Committee of Building a Manufacturing Power

Standards bridge innovation and quality, and profoundly influence them. On one hand, the essence of standards originates from innovation. Because standards are the cohesion of scientific and innovative achievements, which represent advanced and applicable technology and management. With the new wave of technological revolution and industrial transformation driven by digitalization, networking and intelligence, standards are evolving from the end of the innovation chain to the forefront of technological inventions and even scientific discoveries.

On the other hand, the significance of standards lies in quality. The charm of standards is improving quality and efficiency. With the development of the economy and society, the understanding of standardization by humanity is continuously evolving. It not only lays the foundation of market rules but also pioneers in advancing the times. The reform and development of standardization will undoubtedly play a greater role in promoting innovation, advancing quality, and accelerating the development of new technological productivity.

Although the publication of the *National Standardization Development Outline* preceded the proposal of the concept of "new quality productive forces", we can still restudy the Outline to figure out where to start and how to fully leverage the role of high standards in leading the development of new quality productive forces.

For example, in advancing supply-side structural reform of standards, an ecosystem for development of new quality productive forces is being cultivated. Among the more than 8,100 publicly available association standards, those related to strategic emerging industries account for as much as 52.6%. Standards have facilitated the convergence of various innovative and quality elements within the industrial chain, significantly accelerating the integration of new technologies into the standards system.

The Outline proposes the implementation of the Enterprise Standards Forerunner System. Through the implementation of this system, the innovative vitality of enterprises is further stimulated, with their quality and brand capabilities significantly enhanced, and the effective supply of high-end products and services increased. The exemplary and demonstrative role of enterprise standards forerunners are driving the overall industry upgrading.

# Quality foundation support for advancing high-quality development with new quality productive forces

**Wang Haizhou**
Academician of Chinese Academy of Engineering and Professor at China Iron & Steel Research Institute Group Co., Ltd.

The National Quality Infrastructure (NQI) is a foundational technical support system with the goal of improving quality. Its purpose is to ensure the quality of goods and support fair trade, and standardization is the basis and carrier of quality foundation support.

The Chinese Academy of Engineering (CAE) has supported a series of strategic consulting studies on standardization, examined the theoretical basis of quality foundation standardization, and explored development strategies for quality foundation support across the entire industry chain in modern industries. It has also conducted research and demonstration work on conformity assessment in all-round modern industries.

Through a series of studies, CAE has explored three important theories in the field of standardization: the entropy reduction theory of standardization, the multidimensional matrix organizational structure theory of standardization, and the standardization configuration theory of multiple interwoven chains and webs.

The first theory will support the standardization of innovation in new quality productive forces and scientific research, supporting the construction of a comprehensive quality foundation system through standardization. The second theory will support the essence of new quality productive forces, optimize the qualitative change of combination, and support the construction of a cross-industry all-round standardization system. The third one will support the effectiveness of the new quality productive forces and the quality improvement of all-element productivity, as well as the construction of a standardized system across the entire industry chain.

# Enhancing basic industrial capabilities and promoting high-quality development in the manufacturing industry

**Chen Xuedong**
Deputy General Manager and Chief Engineer of China National Machinery Industry Corporation (Sinomach), and Academician of Chinese Academy of Engineering

Over the past decade, China's manufacturing industry has achieved tremendous success, producing a series of significant and emblematic achievements. Currently, China has ranked the first in the world in terms of value added in exports and export share for 14 consecutive years.

However, China's manufacturing industry is still positioned at the low to mid-end of the global value chain, with seven notable issues. (1) Enterprises have weak independent innovation capabilities, with few original, disruptive, and transformative achievements. (2) The industrial basis is weak, with relatively low quality and efficiency indices as well as a lack of world-renowned brands. (3) Energy utilization efficiency is low, with energy consumption per unit of GDP being more than 2.6 times that of developed countries. (4) The level of using information technology to transform traditional production methods and processes needs further improvement. (5) The coordinated development between industry and urbanization, as well as agricultural modernization, entails enhancement. (6) There is room for further strengthening international openness, sharing, and cooperation. (7) There is a shortage of engineers and skilled talent in the manufacturing industry.

Taking Germany and Japan as examples, developed countries emphasize the construction of legal and regulatory systems, and vigorously implement the strategy of strengthening the foundation. They focus on the integration of technology and industry, establishing many institutes for generic technology research. They also emphasize the support for SMEs, interdisciplinary integration, and coordinated efforts between industry, academia, and research institutions. Additionally, they value the supply-demand relationship between main equipment and component companies, as well as comprehensive vocational education systems.

By analyzing the formation mechanisms of various transformative and disruptive technologies in Western countries, Sinomach cultivates the innovation mechanism for the international market, and creates an environment conducive to the development of the new quality productive forces. The company combines goal-oriented and problem-oriented approaches to systematically support research on urgent and forward-looking issues. It has also proposed measures to integrate industry and education, and cultivate entrepreneurs, engineers, and standardization talents.

# Modular construction of AI and its groundbreaking applications

**Zhang Jianwei**
Member of German National Academy of Science and Engineering, Foreign Academician of Chinese Academy of Engineering

Twelve years ago, Germany proposed the concept of Industry 4.0, which essentially sets the framework of manufacturing. Since then, Industry 4.0 has led the global integration of AI robots and traditional manufacturing standards.

I have over 30 years of experience in the fields of AI robots and intelligent manufacturing. I believe that the deep integration of AI, the Internet of Things, robotics, virtual reality, 5G communication, new materials, and new energy resources is of great importance for disruptive innovation. How can we use AI and high tech to solve the key and pain points in people's livelihoods? There is much for innovation in this area, including future intelligent manufacturing, smart mobility, home services, and future education.

ChatGPT is an unembodied intelligence chatbot that summarizes and analyzes information after retrieving data from the internet. In the future, we can make intelligent systems embodied, capable of perceiving the real world and performing enhanced learning, potentially with self-driving capabilities. This is a new form of embodied intelligence that could lead to innovative applications in intelligent driving, intelligent manufacturing, and intelligent healthcare. Currently, AI is experiencing explosive growth, and computing power is growing exponentially.

Last month, our surgical robot research project, in collaboration with the Chinese PLA General Hospital, was approved. Surgical robots represent a new productive force of the future, characterized by high investment, high technology, and high added value. In terms of functional modules for surgical robots, we can establish a process in which perception, operation, human-machine interface planning, safety, and other features interact among doctors, patients, and robots. The international standards in this area are still immature. We can lead the development of some high-tech standards through surgical robot products, and I believe this is a direction worth strengthening.

In the future, standardization will drive and lead technological innovation, especially in the fields of AI and robotics. There are many opportunities for collaboration in interdisciplinary, cross-border integration, and continuous innovation. Let us join hands to tackle global challenges and create a harmonious society and a better life.

# Standards promote consumption upgrading and facilitate high-quality economic growth

**Luo Fangping**
President of China National Institute of Standardization (CNIS)

Recently, the *Work Plan for Promoting High-quality Economic Development through Standards Upgrades* was approved by the State Council. SAMR and six other departments issued the *Action Plan for Standards Upgrades to Drive Equipment Renewal and Trade-in of Consumer Goods*, which outlines the implementation of a new round of standards upgrades.

The impact of standards upgrades on boosting consumption and promoting development has already shown. Firstly, standards upgrades have led industrial enterprises to update high-efficiency and energy-saving equipment. The revised mandatory national standard GB 16780-2021, *The norm of energy consumption per unit product of cement*, forces approximately 20% of cement production enterprises to renovate their production lines, potentially saving 11.6 million tons of standard coal annually. Following the revision and implementation of GB 18613-2020, *Minimum allowable values of energy efficiency and values of efficiency grades for motors*, the energy efficiency limit has increased by 5.1% compared to the first edition in 2002. By 2025, this is expected to drive the investment of 34 billion yuan in technological transformation in motor production enterprises, potentially saving over 60 billion kilowatt-hours of electricity annually.

Secondly, standards upgrades have driven the improvement of the quality of consumer goods and services. Mandatory national standard GB 21455-2019, *Minimum allowable values of the energy efficiency and energy efficiency grades for room air conditioners*, has achieved international leadership in energy efficiency indicators, helping to eliminate 45% of high-energy-consumption air conditioning products in the Chinese market.

Thirdly, standards upgrades have promoted the replacement and application of emerging technologies. GB/T 29632-2021, *Range of main parts and the guarantees certificate in repair, replacement and return warranty of household automobile*, has encouraged automobile companies to legally and compliantly implement the three guarantees policy, protecting the legitimate rights and interests of over 100 million household automobile consumers.

Fourthly, standards upgrades have facilitated high-level recycling of resources. The national demonstration project for circular economy standards in the coal chemical industry has effectively guided the traditional coal chemical industry towards the clean and eco-friendly new coal petrochemical industry. As a result, the water consumption per unit product has decreased by 10%, and the compliance rate for exhaust emissions has reached 100%.

# Standardization trends and digitalization frontiers

**Yuan Yu**
Board Member and Treasurer of Metaverse Standards Forum

Standardization shows its development trends in six aspects. **Firstly, a shift from market-driven standards to market-driving standards.** Standards are generally driven by the market, and the demand of standards development is generated with mature technologies and markets. However, emerging industries such as autonomous driving require standards in the first place.

**Secondly, the integration of standards and open source.** The development of many key technologies is closely related to open source, which helps facilitate the extensive application of standards.

**Thirdly, more attention paid to the pre- and post-activities of standards development.** The pre- and post-activities, brought into the work scope of SDOs, are a crucial part in the life cycle of a standard. They include the exploration and discussion of standardization demands before standards development and the publicity, testing and certification after standards development.

**Fourthly, an expansion from technical to non-technical standards.** More demands for standards development occur in non-technical fields. Strictly speaking, these standards are non-technical standards with a focus on the social impacts and ethical constraints related to technologies.

**Fifthly, active participation in addressing major issues.** SDOs not only propose bottom-up demands for standards development, but also pay top-down attention to major issues in society, environment and other areas. They wish to empower or provide solutions via standards.

**Lastly, the digitalization of standards.** Many SDOs are working on the digitalization of standards and machine readability. Taking machine readability in consideration will help improve the reliability of the testing, certification and verification of standards in the process of standards development.

The core driving forces of digitalization frontiers are AI, metaverse and Web3, which promote each other mutually. For example, AI has greatly facilitated the content generation and device interaction of metaverse. AI will replace a lot of human labor and polarize the labor market, while metaverse may bring the best solution. Metaverse can provide relevant testing environment for AI technologies, obtain massive and multi-modal training data, and make the lowest costs and risks, as well as the highest efficiency and diversity.

编译/靳吉丽 曹欣欣

(Edited and translated by Jin Jili and Cao Xinxin based on the speeches)


中国标准化协会
标准引领 推动高质量发展

# Parallel session on ESG standardization

In January 2024, the *Guidelines for Promoting the Beautiful China Initiative in All Respects* clearly put forward the need for the environmental, social and governance (ESG) evaluation. This is the first time that ESG was written in a document of the central government.

As one of the parallel sessions, the seminar on ESG standardization in the context of carbon peak and neutrality goals was held on May 22 to focus on policies and standards on ESG, strengthen technical communication, and contribute to the national strategy on carbon peak and neutrality.

The event was moderated by Li Aixian, Vice President of China National Institute of Standardization (CNIS), and addressed by Tian Jun, Vice Mayor of Quzhou, and Zhao Xiangeng, Former Vice President and Academician of Chinese Academy of Engineering (CAE). The highlights of the speeches are presented as follows:

**Zhao Xiangeng**
Former Vice President and Academician of CAE

ESG is a new term coined in 2004 by the United Nations Global Compact for promoting global sustainable development. In recent years, it has become an international consensus that ESG leads the green and low-carbon transition. Western developed countries have actively facilitated the global application of ESG ideas, so has China.

To accelerate the standards system building and drive the effective implementation of standards, we should: Firstly, establish a binary standards system for ESG suitable for national conditions and geared to international conventions, and bring up the plan with equal emphasis on both government-led standards and market-oriented standards. Secondly, strengthen the overall plan and coordination of the ESG standards system building with concerted efforts and policy guidance. Thirdly, improve the implementation of ESG standards and rules, and help enterprises improve their digital management and governance of ESG. Fourthly, put more effort into the participation in the development of ESG international standards, make use of technical platforms such as the Chinese Expert Working Group for ISO/ESG CC, and submit the proposals for ESG international standards.

**Fu Wenbiao**

First-level Inspector of Standards Innovative Management Department, SAMR

According to Bloomberg, global ESG assets are expected to exceed 53 trillion dollars by 2025, accounting for more than a third of projected total assets under management.

In June 2023, two global sustainability disclosure standards, IFRS S1 and IFRS S2, were published by the International Sustainability Standards Board. In July 2023, the European Sustainability Reporting Standards were adopted by the European Commission.

ISO/ESG CC was established in September 2022 to promote the implementation of ESG strategies on the whole. In March this year, the proposal of the IWA on the framework for implementing ESG principles was approved, which was the first of its kind in ISO. ISO also joined the Impact Management Platform.

In China, several policies and measures were issued to provide the direction for enterprises' participation in ESG activities. In July 2023, State-owned Assets Supervision and Administration Commission proposed a comprehensive template for the indicator system and disclosure of ESG special reports of listed companies held by central enterprises. In March this year, seven departments such as the People's Bank of China released the guidelines for methods and models to include ESG factors into credit ratings in credit rating agencies. In April, the guide for sustainability reporting of listed companies was released. Besides, Chinese experts have actively participated in the development of ESG international standards.

**Ding Qing**

Associate Researcher of Branch of Resource and Environment Research, CNIS

So far, China has developed and implemented more than 100 national standards related to ESG, covering the areas such as environment management, energy and water conservation, and green finance. But there is no national standard to directly regulate and guide the ESG work.

In the finance area, several projects for sectoral and national standards have been approved in recent years. In February this year, SAC and the People's Bank of China approved two comprehensive standardization pilot projects on social management and public services in cities of Beijing and Huzhou.

Sixty-two association standards on ESG have been published on the national platform for association standards information, which focus on ESG information disclosure, evaluation and report, requirements for personnel in agencies, management system and other aspects.

CNIS has carried out the research on ESG standards system, and preliminarily built the framework for the standards system. The framework is composed of fundamental and common aspects, information disclosure, management system, analysis and evaluation, personnel of agencies, and investment and financing of ESG.

编译/靳吉丽

(Edited and translated by Jin Jili based on the speeches)

# Parallel session on marine standardization

The session on marine standardization was successfully held on May 22. Yu Xinli, President of China Association for Standardization (CAS), was invited to deliver a keynote speech. The highlight of her speech is presented as follows:

## Paths and methods for standards to lead high-quality development

**Yu Xinli**
President of China Association for Standardization (CAS)

The report of the 20th National Congress of the Communist Party of China pointed out that high-quality development is the primary task in comprehensively building a modern socialist country.

At the Central Economic Work Conference last year, Chinese President Xi Jinping stated that high-quality development must be regarded as the hard truth in the new era. It is necessary to strengthen quality support and standard guidance, and to enhance the resilience and security of industrial and supply chains.

The *National Standardization Development Outline*, issued in October 2021, calls for accelerating the establishment of a standards system that promotes high-quality development.

**Playing a leading role**

Standards need to play a foundational and leading role. To lead high-quality development, we must first integrate technological innovation into standardization work. In fact, standards are at the forefront of technological innovation and are a strong driving force for the new wave of technological innovation, which provide the direction for innovation. Standards can offer the best technical routes and solutions to problems.

Technological innovation cannot be separated from the adoption of international standards and advanced foreign standards, as these standards are embeded in many advanced technologies and technological development trends. It is essential to recognize that the level of a country's standards is consistent with its level of economic and social development. Therefore, enterprise representatives and researchers need to actively participate in the development and revision of international standards.

To play a leading role, standards must first integrate deeply with technology and synergize with the development of industrial and supply chains. In an industry, the number and level of standards are positively correlated with the stage of industrial development. When the industry is in a rapid growth stage, standardization work is active, and the number of standards grows rapidly. When the industry enters a mature or declining phase, standards are also mature and stabilized, with a downward trend of the demand and supply for standards.

When Chinese enterprises are at the medium and low end of the international division of labor, especially at the low end, they mainly focus on standards application. So, standards reflect the maturity of industrial development and the vibrancy of the innovation and value chains.

**A part of the governance system**

Besides deeply integrating with technological innovation and synergizing with industrial and supply chains, standards must become a key issue in the governance system. The Outline proposes that standards should play a foundational and leading role in promoting the modernization of the national governance system and governance capacity.

China's legal and regulatory system is like a pyramid. At the top are laws and regulations, which are the fundamental systems of national governance. The middle layer consists of control norms, composed of mandatory standards, which are the guarantee systems of national governance. The bottom layer is made up of numerous voluntary standards, including standards recommended by both government and market.

**Paths and methods**

To make standards play a leading role and promote high-quality development, the path is to establish a dual-standard system consisting of government-led standards and market-oriented standards.

In 2015, the State Council issued the *Plan for Deepening Standardization Reform*, which puts forward creating a new standards system composed of government-led standards and market-oriented standards, in which both types of standards coordinate and complement each other. In November 2017, the revised *Standardization Law of the People's Republic of China* was approved.

Market-oriented standards include association standards and enterprise standards. Social organizations such as societies, associations, chambers of commerce, and industry technology alliances are encouraged to coordinate relevant business entities to jointly develop association standards that meet market and innovation needs. These standards are adopted by agreement among the members of the organization or are available for voluntary adoption by society according to the organization's regulations. The government guides and regulates association standards.

By establishing the standards system, integrating technological innovation, and aligning with industrial and supply chain development, we can effectively lead high-quality development and enhance national governance through standardization.

编译/曹欣欣

(Edited and translated by Cao Xinxin based on the speech)

# Parallel session on robot standardization

The session on robot standardization, hosted by CAS and organized by Robot Sub-committee of CAS, IAM Science and Technology Company, China Jiliang University and Jinyi Holding Group, was held on May 23, which was presided over by Ma Dejun, Vice President of CAS.

The meeting invited 9 experts from well-known research institutes, universities and companies to deliver keynote speeches, sharing their latest research results and profound insights on robots and standards. Here, the main contents of two speeches are presented.

**The low-altitude economy & standards**

**Shu Zhenjie**
Chief Scientist of Chinese Aeronautical Establishment

The low-altitude economy refers to economic activities within the low-altitude space, which is vertically 1,000 meters or less above the ground (extendable to 3,000 meters based on regional characteristics and actual needs).

The general aviation industries of foreign countries are highly developed, with a greater number of aircrafts, airports, pilots, and flight hours compared to that of China, giving it an initial advantage in the low-altitude economy. In 2022, there were approximately 213,000 general aviation aircrafts in the United States, accounting for 48% of the global total, with about 26.457 million flight hours. In contrast, there were approximately 3,186 general aviation aircrafts in China, with about 1.219 million flight hours.

In the new low-altitude economy primarily driven by various unmanned aerial vehicle (UAV) applications, China leads the products including civil drones and eVTOL (electric vertical take-off and landing) aircrafts. Traditional giants such as Boeing, Airbus, Joby, and Lilium and startups are actively engaged in eVTOL R&D and manufacturing. In the UAV and eVTOL fields, China takes the lead with a growing market scale. The sales of drones account for about 70% of the global market share, and EHang has obtained the world's first eVTOL type certificate.

The low-altitude economy faces several legal and regulatory issues: **First, incomplete implementation of low-altitude laws and regulations.** Key regulations such as the *Interim Regulations on the Flight Management of Unmanned Aerial Vehicles* and *Rules on the Safety Management of Civil Unmanned Aircraft* (CCAR-92) have been

released for a short time. Targeted policies and documents need to be formulated to strengthen the implementation of low-altitude laws and regulations. **Second, a lack of a comprehensive low-altitude standards system.** There is a need to develop low-altitude standards, establish a low-altitude standards system, and create a set of applicable standards based on industrial scenarios and practical experience. These standards can be converted into international standards through international standards organizations.

**Yue Jingsong**
Deputy Chief Engineer of Testing Center, China Household Electrical Appliances Research Institute

**Standards, testing, and certification of household service robots**

According to the data of All View Cloud, the retail sales of cleaning robots (robot vacuums) reached 13.7 billion yuan in 2023, a year-on-year increase of 10%, with retail volume reaching 4.58 million, a 4% year-on-year increase. In 2023, 73.3% of all-purpose cleaning robots were equipped with self-cleaning and automatic dust collection functions. There are over 100 brands of window cleaning robots, and the total sales volume in the industry has reached 400,000, with the industry's scale expected to exceed 1 billion yuan.

China Household Electrical Appliances Research Institute (CHEARI) leads the development and revision of several household cleaning robot standards, which include national standards such as GB 4706.7-2014, *Household and similar electrical appliances—Safety—Particular requirements for vacuum cleaners and water-suction cleaning appliances* (identical to IEC 60335-2-2:2009), GB/T 34454-2017, *Dry cleaning robots for household use—Methods of measuring performance* (identical to IEC 62929:2014), GB/T 40229-2021, *Performance evaluation methods of mobile household robots* (identical to IEC 62849:2016), GB/T 41527-2022, *General safety requirements for household and similar service robots*, GB/T 41433-2022, *Household and similar service robots—Consumer guide*, and the enterprise standard QB/T 4833-2023, *Household and similar cleaning robots*.

The two national standards on the electromagnetic compatibility of service robots, GB/T 37283-2019 and GB/T 37284-2019, were developed for the first time in China, which specify the layout of service robots during testing and special testing requirements, addressing the consistency issues in the testing modes and states for the electromagnetic compatibility of service robots.

The international standards related to household cleaning robots include: IEC 63327:2021, *Automatic floor treatment machines for commercial use—Particular requirements*, IEC/ASTM 62885-7:2020+AMD1:2022, *Surface cleaning appliances*, and IEC 62849:2016, *Performance evaluation methods of mobile household robots*.

编译/曹欣欣

(Edited and translated by Cao Xinxin based on the speeches)

# Parallel session on association standards

The parallel session on association standards was held on May 23, which were chaired by Wang Haizhou, Academician of CAE, Cui Gang, Former Director General of Special Equipment Bureau of SAMR, and Chen Hongjun, Former Deputy Director General of Standards Technical Management Department, SAMR.

Zhao Xiangeng, Former Vice President and Academician of CAE, addressed the event. Nine representatives made keynote speeches on topics such as how association standards support high-quality development, capacity building of social organizations, and how association standards contribute to industrial development. The highlights of speeches are presented here.

**Zhao Xiangeng**
Former Vice President and Academician of CAE

Since 2018, CAE has carried out systematic standardization research with SAMR, and established consulting projects for the research on national standardization strategies. So far, four phases of research work have been finished. The research achievements have played a key role in formulating and implementing the *National Standardization Development Outline*, and building the binary standards system, which is composed of government-led standards and market-oriented standards.

As an important component of market-oriented standards, association standards have the characteristics of rapid development, timely response to market demands, and efficient standards promotion. By the end of April this year, 8,924 social organizations have registered on the national platform for association standards information, and released 81,344 association standards.

In the next step, the research will focus on how to help association standards develop from increasing the quantity to enhancing quality and efficiency, and facilitate the rapid transformation of scientific and technological innovation achievements into new quality productive forces.

**Wang Peng**
Deputy Secretary General of Chinese Society for Testing & Materials, Zhongguancun (CSTM)

The brand consulting project of CAE, "Research on key problems in implementing the *National Standardization Development Outline*", has four research topics, one of which focuses on how association standards support high-quality development. It covers the current development situation of association standards, theoretical and practical research on how association standards support scientific and technological innovation and high-quality industrial development, international strategies of association standards, as well as guidance and supervision of association standards.

In China, the development of association standards shows a few characteristics: association standards have entered a rapid development period; a great number of association standards have emerged to meet market demands; interactive development has been carried out between association standards and scientific and technological innovation; association standards play a key role in improving the standardization level of industries; and breakthroughs have been made in the internationalization of standards.

The sustainable development of association standards can be achieved if they can facilitate the theoretical basis of high-quality development, and have international vision and capabilities with government's regulation, guidance and supervision.

**Tian Chuan**
Director of Standardization Research Center for High-tech Industries, Beijing Institute of Standardization

Association standards have three important attributes. The first and the most important one is market attribute. Social organizations need to coordinate relevant business entities and jointly develop standards to meet market demands. The attribute puts emphasis on openness, transparency, fairness and consensus. The second is technical attribute. Association standards can solve many problems, for example bottleneck problems. The third is public attribute. Association standards may be or not be disclosed to the public. Based on the above attributes, social organizations should strengthen their capabilities in organization, industrial coordination, market operation, internationalization and technical innovation.

Here are some suggestions. Firstly, standards development should be fully participated by stakeholders to reach a consensus. Secondly, standards implementation and promotion should integrate testing and certification, which are jointly propelled by stakeholders. Thirdly, the coordination of innovation resources and quality infrastructure should be valued to enhance standardization talent cultivation. Fourthly, the publicity of typical cases and the demonstration of social organizations should be strengthened. Fifthly, to win social recognition, association standards can be adopted in government procurement, inspection and testing.

编译/靳吉丽

(Edited and translated by Jin Jili based on the speeches)

# New international standard for human machine interfaces


According to the IEC Electropedia, an HMI is a "display screen, either as part of an intelligent electronic device (IED) or as a stand-alone device, presenting relevant data in a logical format, with which the user interacts. An HMI typically presents windows, icons, menus and pointers, and may also include a keypad to enable user access and interaction."

HMIs have become ubiquitous across various industries as automation and digitization takes hold of industrial processes. They typically enable operators to monitor and control plants remotely.

The new standard is expected to be published by the end of August 2024. It deals with the complete lifecycle of HMIs, from conception to decommissioning. "The purpose of this document is to address the philosophy, design, implementation, operation and maintenance of HMIs for automation systems, including multiple work processes," explains Dr. Maurice Wilkins who jointly led the standard project, along with Dave Board, inside IEC Technical Committee 65. The TC prepares international standards for systems and elements used for industrial process measurement, control and automation.

One of the advantages of the international standard is that it has horizontal applications across many industries. "IEC 63303 is intended to be generic and focuses on the graphical user interface design and performance criteria to ensure operators have the best possible knowledge and situation awareness of the process they are overseeing," Wilkins says.

Other TCs inside the IEC can use the document as a basis for their own HMI standardization. The standard is expected to be used by companies manufacturing, implementing, designing or using HMIs, across a wide range of manufacturing processes.

(Source: IEC)

# ITU and UNIDO join forces for smart and inclusive industry


The International Telecommunication Union (ITU) and the United Nations Industrial Development Organization (UNIDO) aim to strengthen their collaboration to advance the Sustainable Development Goals (SDGs).

ITU Secretary-General Doreen Bogdan-Martin and UNIDO Director General Gerd Müller signed the Joint Declaration regarding the collaboration between the two UN specialized agencies on the advancement of the 2030 Agenda for Sustainable Development, in particular on industrialization, infrastructure development, and innovation in the digital age, on June 25 at ITU headquarters in Geneva, Switzerland.

"The signature of this Joint Declaration with UNIDO Director General Gerd Müller at such a critical time in our common efforts to achieve the SDGs reinforces the strong link between universal meaningful connectivity and the revolution taking place in the industrial sector," said Bogdan-Martin.

The relationship between ITU and UNIDO focuses on Goal 9 of the SDGs which calls for the building of resilient infrastructure, the promotion of inclusive and sustainable industrialization, and the fostering of innovation.

The new joint declaration calls for the agencies to create innovative models of cooperation for leveraging multi-stakeholders' resources as well as an enabling environment and platform for exchanges with all stakeholders addressing the SDGs.

The organizations will cooperate in a number of thematic areas addressing the impact of digital technologies on industry and society: AI and digital governance, broadening digital access, capacity building and digital skills development, cybersecurity, digital agriculture, digital economy, digital transformation and innovation ecosystems, emerging digital frontiers, Industry 4.0 and the metaverse, joint innovation challenges, public-private partnerships and global collaborations, and sustainable technologies and environmental sustainability.

(Source: ITU)

## CIGRE Paris Session 2024

August 25-30, Paris, France


The biennial Session is held in Paris, France in even number years. It is the number one global power system event in the world, bringing together some 9,000 power industry participants from over 100 countries, including 3,600 international experts and other decision-makers. This is a unique week-long interactive opportunity. Over 160 working meetings, over 30 Study Committee sessions and 800+ technical papers spanning the end-to-end power system.

Following the 5-day Paris Session, the CIGRE Technical Council also meets to gather feedback and lessons learned, to define what preferential topics should be addressed in the next two-year time frame. For more information, please visit the event website: **https://session.cigre.org/**

## ETSI & CEN Workshop on EU Digital Identity Framework Standards

September 10, Sophia Antipolis & online

Regulation (EU) 2024/1183 amending Regulation (EU) 910/2014 on electronic identities, authentication and signatures (eIDAS 2) was published in the Official Journal of the European Union this spring 2024. This amendment establishes an ambitious European Digital Identity Framework with digital identity wallets and a number of new trust services. This will bring about a major transformation of security of the European digital infrastructure facilitating cross border transactions, supporting seamless access to financial, governmental and commercial services across Europe with a high level of accountability.

ETSI and CEN are working together to develop a number of standards to support this new regulatory framework building on the latest globally recognized standards for website authentication, open identities and mobile based wallets. The workshop will present the latest status of these standards and is aimed to include demonstrations from large scale pilots applying the EU Digital Identity Wallet.

Conducted by ETSI ESI Technical Committee and CEN/TC 224, the workshop, and the following open consultation on draft standards, provides the opportunity to influence the direction taken in CEN and ETSI standards supporting the European Digital Identity Framework.

For more information, please visit the event website: **https://www.cencenelec.eu/news-and-events/events/2024/2024-09-10-12-etsi-cen-ws-eu-digital-identity-framework-standards/**

## ISO Annual Meeting

September 9-13, Cartagena de Indias, Colombia & online


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

This year's event is hosted by ICONTEC, the national standards body of Colombia. With the theme "Breaking boundaries", this open-to-all event comes at a pivotal time for the world. Over the course of a week, participants will engage in meaningful discussions about the most pressing challenges facing our planet today, while also exploring collaborative standards-based solutions for the future.

Sessions will focus on three thematic pillars: sustainable and inclusive growth, responsible AI for all, and the future of human capital.

For more information, please visit the event website: **https://www.iso.org/annualmeeting/**

## IoT Data and Device Interoperability with TIPPSS for Connected Vehicles

September 24, virtual

With the integration of sophisticated technologies and increased data connectivity, the value of a car is no longer confined to just transportation—it is also a hub of personal and operational data. This change naturally leads to cybersecurity challenges from remote hacking, to breach of data privacy, and potential physical safety concerns as operational functions of a vehicle are highly vulnerable.

Making IoTs interoperable, secure and private can be achieved using the framework of the existing IEEE P2933—Draft Standard for Clinical Internet of Things (IoT) Data and Device Interoperability with TIPPSS—Trust, Identity, Privacy, Protection, Safety, Security. This workshop will bring together professionals from technology developers in software, firmware, and devices; automotive manufacturing, regulatory, researchers and other related stakeholders to understand the needs for TIPPSS for IoTs in connected vehicles and the related use case requirements.

For more information, please visit the event website: **https://engagestandards.ieee.org/gchc-virtual-workshops-register.html/**

# Study on standardization of intangible cultural heritage protection

## 非物质文化遗产的标准化研究

By Han Zhiyou
文/韩知佑
(The Palace Museum)

**Abstract:** Intangible cultural heritage is an important part of human civilization, and its protection and inheritance are of great significance for maintaining the diversity of national culture and the continuity of traditional culture. In order to better protect intangible cultural heritage, many countries have formulated corresponding protection standards and policies. This paper summarizes and studies the current standardization development of intangible cultural heritage protection in various countries, explores its significance, current situation, and development trends, and provides suggestions for the standardization of intangible cultural heritage protection in China.
**Keywords:** intangible cultural heritage, standardization, inheritance, diversity

## 1. Introduction

Intangible cultural heritage embodies cultural diversity and multiculturalism. Cultural diversity to humanity is as biodiversity to ecology. Various ethnic groups, cultures, and civilizations should respect each other, replace conflicts with dialogue, actively seek identity and consensus through mutual understanding and empathy, and collectively uphold a diversified system of co-existence, in order to preserve and develop the cultural environment, and improve the quality of human life. Respecting a pluralistic cultural framework and the achievements of various civilizations has become a consensus among Member States of the United Nations.

However, when it comes to standards for intangible cultural heritage, will the pluralistic cultural framework of intangible cultural heritage be disrupted? Will various ethnic groups, cultures, and civilizations tend towards homogenization, uniformity, or be assimilated by the process of global integration? This may be the common concern and confusion at home and abroad.

## 2. Intangible cultural heritage and standardization

### 2.1 Definition of intangible cultural heritage

Intangible cultural heritage refers to various non-material cultural expressions created and passed down by humanity, including oral traditions, performing arts, social practices, rituals, festivals, knowledge and practices, and traditional crafts. The cultural heritage is typically transmitted through languages, performances, and practice, rather than being preserved in the material form[1].

### 2.2 Definition of standards and standardization

As humanity continues to explore and transform the world, it is essential to establish common benchmarks to achieve optimal order. Standardization provides a common baseline for humanity, regulates human behavior, and promotes the realization of optimal order, driving the development and progress of society. The scope of standards extends beyond the fields of production, distribution, and consumption to various other aspects of human life. Indeed, the protection and inheritance of intangible cultural heritage is one of the areas covered by standards as well.

ISO/IEC Guide 2:2004, *Standardization and related activities—General vocabulary*, provides definitions for both standards and standardization. Through standardization activities and prescribed procedures, standards are developed based on consensus, to provide rules, guidelines, or characteristic deliverables for various activities for common use and re-usability. Standardization aims to provide universal terms to promote mutual benefits and to address practical or potential issues, as well as the activities of developing, publishing, and implementing standards[2].

### 2.3 Relationship between intangible cultural heritage and standardization

When it comes to the integration of intangible cultural heritage and standardization, the focus is on the repetitive elements and concepts within the domain of heritage

preservation and inheritance. Through the development, publication, and implementation of relevant standards, the aim is to achieve uniformity, the best order, and societal benefits. Within this context, the standardization of intangible cultural heritage becomes a central theme. The core objective is to define the "repetitive elements" in the preservation and inheritance of intangible cultural heritage, promoting its orderly and standardized development.

Following the principle of examining standardization objects from macro, meso, and micro levels, standardization activities are observed as a macro whole, with practical or potential problems being the objects[3]. In terms of scientific protection, intangible cultural heritage conservation faces issues such as the impact of digitization, networking, and intelligence on conservation ideas and methods. Standards for conservation work, management regulations such as China's *Law on Intangible Cultural Heritage*, and digital standards for intangible cultural heritage are related to development of standards at the meso level.

At the micro level, standardization objects refer to specific products, processes, or services. This includes craft processes, documentation of oral traditions from inheritors of intangible cultural heritage, and the outcomes of standardization efforts, such as the local standard for the protection of Jingle paper-cutting, a type of intangible cultural heritage in Xinzhou city (DB1409/T 46-2023).

The standards development of intangible cultural heritage should involve democratic negotiation and prioritize the role of communities, groups, and individuals in preserving cultural heritage. Various challenges arise when traditional intangible heritage becomes a public concern, including disputes over origins and ownership. It is crucial for cultural departments, institutions, inheritors, communities, and organizations to actively participate in the standard-setting process alongside standardization and quality supervision efforts[4-5].

### 2.4 Current standards related to intangible cultural heritage

On February 25, 2011, the *Law on Intangible Cultural Heritage of China* was officially promulgated, signaling the beginning of standardization in the protection of intangible cultural heritage. Since Kunqu Opera was included in the first batch of UNESCO's Representative List of the Intangible Cultural Heritage of Humanity in 2001, China has been leading the protection of intangible cultural heritage for approximately 20 years. During this period, China has been through the development process from protection of ethnic folk cultures to protection of intangible cultural heritage, from concept to practice, from the listing phase to the application phase, and further into the era of standardization.

The revised *Standardization Law of the People's Republic of China* in 2018 stipulates in Chapter 2 that standards include national standards, sectoral standards, local standards, association standards, and enterprise standards. The essence of standardization is to promote the orderly and standardized development of certain objects.

According to relevant literature and the National Public Service Platform for Standards Information (**http://std.samr.gov.cn**), there are currently approximately 65 standards on intangible cultural heritage. Among them, 36 standards are related to the protection and inheritance of intangible cultural heritage, 5 standards are for the industries related to intangible cultural heritage, and 24 standards are related to intangible cultural heritage crafts. Local standards account for the largest proportion of existing standards (Figure 1), which is closely related to the wide and diverse distribution of intangible cultural heritage.

For example, in 2018, Xinjiang published the local standard DB65/T 4138-2018, *National intangible cultural heritage—Mulberry paper*. In August 2019, Zhenjiang city issued and officially implemented the local standard DB3211/T 1008-2019, *The protection of intangible cultural heritage—The operating rules of hand embroidered art for home textiles*. In January 2020, Heilongjiang province issued and implemented the local standard DB23/T 2712-2020, *Intangible cultural heritage in Heilongjiang—Manchu Cheongsam making technique*. In 2022, Zhengzhou city issued and implemented the local standard DB4101/T 34-2022, *Intangible cultural heritage—Technique for making Chengni inkslabs by mud from the Yellow River*. In the same year, Hubei province issued and implemented the local standard DB42/T 1942-2022, *Protection and utilization of intangible cultural heritage in traditional villages*. Additionally,

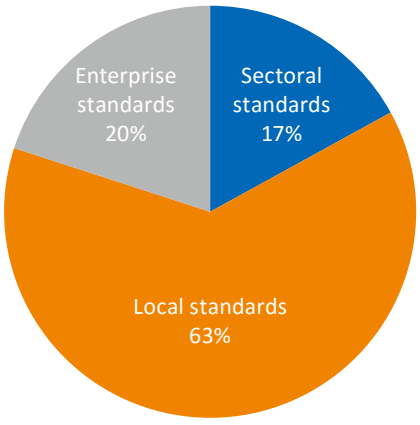



Figure 1: The distribution of standards related to intangible cultural heritage

sectoral standards such as the series of WH/T 99-2023, *Digital safeguarding of the intangible cultural heritage—Digital resources collection and description*, were issued and implemented in 2023. Currently, there are no existing national standards for intangible cultural heritage.

## 3. Challenges of and suggestions on standardization for intangible cultural heritage

When intangible cultural heritage is combined with standardization, modern scientific methods can be applied to protect intangible cultural heritage. Standardizing the productive protection of intangible cultural heritage has become an important impetus for cultural inheritance and socio-economic development. Specifically, it can improve relevant systems, coordinate the relationship between relevant departments, balance the interests of all parties, and promote the sustainable development of intangible cultural heritage projects, rather than restrict the innovation of local communities and inheritors. However, there are still some challenges in the development of standardization for intangible cultural heritage, and the corresponding measures are as follows:

(1) Diversity and complexity of intangible cultural heritage: Diversity and complexity are fundamental aspects of intangible cultural heritage, which encompasses a wide range of cultural expressions and traditional skills deeply rooted in various cultural forms and practices. When developing standards for the protection of intangible cultural heritage, it is crucial to acknowledge and respect the cultural traditions of different regions and ethnic groups. This requires comprehensive examination of the historical significance of intangible cultural heritage, delving into its historical evolution in terms of production, daily life, and society.

By delving into the historical perspective, we can uncover the intrinsic value and significance of intangible cultural heritage, preserving original historical artifacts and cultural knowledge. This approach allows us to protect and promote the diverse and rich cultural heritage that serves as a reflection of the identities, values, and traditions of communities and societies worldwide. Embracing the diversity and complexity of intangible cultural heritage enables us to appreciate unique cultural expressions and traditional practices that contribute to the cultural tapestry of humanity. Through this inclusive and respectful approach, we can ensure the continuity and vitality of intangible cultural heritage for future generations to cherish and learn from.

(2) Diversity of participants: The diversity of participants is a challenge in developing standards for intangible cultural heritage. Establishing a comprehensive standards system is crucial. Japan's intangible cultural heritage work started early, with the designation and recognition system for important intangible cultural properties and their inheritors and preservation groups established in 1950. The most representative "Living National Treasure" (LNT) recognition system is a form of recognition and the highest praise for individual achievements. Additionally, Japan has established numerous cultural facilities such as museums and research institutions. In the private sector, various conservation groups and businesses are also involved. The system, in place for nearly 70 years, has recognized 102 individuals. This system has propelled the development of Japan's intangible cultural heritage and increased public interest in heritage protection[6].

Since 2007, China's intangible cultural authorities have periodically certified national-level representatives for the inheritance of intangible cultural heritage. By the end of 2023, a total of 3,057 individuals have been recognized as representatives of national-level intangible cultural heritage projects, and have played a positive role in the inheritance of intangible cultural heritage. The representatives of China's intangible cultural heritage and Japan's LNT are similar in recognizing and honoring inheritors. China's certified representatives by cultural authorities are inheritors of intangible heritage, while Japan's treasures especially refer to those important ones. The two systems both play key roles in promoting and protecting their countries' cultural heritage. Learning from each other can enhance the inheritance and development of intangible cultural heritage. By employing stricter standards and the principle of quality over quantity, China could evaluate higher-level, higher-standard, and more influential inheritors of intangible cultural heritage, designating them as LNT of China[7].

In addition to implementing a personal certification system for inheritors of intangible cultural heritage, it is also possible to follow Japan's example and establish a certification system for groups involved in the preservation of intangible cultural heritage. For instance, in cases where a particular craft or technique does not have prominent individual characteristics and involves a large number of practitioners, the group composed of its main members can be recognized as a preservation group. A diversified certification system helps enhance people's enthusiasm for the dissemination of intangible cultural heritage.

(3) Resource input and guarantee: Intangible cultural heritage resources of traditional craftsmanship are of rich cultural, scientific, historical, aesthetic, economic, and social value. The protection of such intangible cultural heritage is a systematic program evolving towards diversification, identification, and comprehensiveness. By introducing the

concept of "standardization+" and relevant technologies into the productive protection of traditional craftsmanship, and based on the distinctive features and basic status of intangible cultural heritage of traditional craftsmanship in various regions and ethnic groups, a standardized protection model can be developed, which is scientifically systematic, reasonable, and adaptable to the modern market. It benefits the vitality of intangible cultural heritage, the prosperous development of traditional culture, and comprehensive and sustainable development of regional economy and society[8].

In Zhejiang province, intangible cultural heritage and standardization have been integrated to refine the elements and cultural characteristics of intangible heritage through the development of management and standards for intangible cultural heritage textile products. The integration contributes to the production of cultural and creative products with distinct regional and craft characteristics, the promotion of intangible cultural heritage textile products, and Chinese wisdom for the inheritance of culture.

## 4. Conclusion

Standardization is crucial for the protection of intangible cultural heritage, as it not only helps maintain the diversity of national culture and the continuity of traditional culture, but also promotes economic development and drives the prosperity of the cultural industry, providing essential support for comprehensive and sustainable development of regional economies and societies. While China has made some achievements in this regard, challenges persist. In the future, there is a need to accelerate the standardization process in the cultural sector, make more efforts, and enhance the depth and breadth of protection for intangible cultural heritage. On one hand, China needs to establish a more diversified certification system for the inheritance of intangible cultural heritage, encouraging active participation from all sectors of society. Additionally, measures should be taken to provide protection for the inheritance and preservation of intangible cultural heritage, in order to promote the vitality of intangible cultural heritage, the prosperity of traditional culture, and the comprehensive and sustainable development of regional economies and societies. On the other hand, it can benefit China's standardization path to strengthen international exchanges and cooperation, understand the latest developments in the standardization of intangible cultural heritage in other countries, and study successful cases overseas.

## References


[1] UNESCO, Cultural Heritage, and Outstanding Universal Value: Value-based Analyses of the World Heritage and Intangible Heritage Conventions [J]. *International Journal of Heritage Studies*, 2013, 21(5):528–530.

[2] Ahmad, Y. The Scope and Definitions of Heritage: From Tangible to Intangible [J]. *International Journal of Heritage Studies*, 2006, 12(3):292-300.

[3] Qiu Ping, Zhao Ruibin, Xiong Hong. Analysis of the Relationship between Intangible Cultural Heritage and Standardization [J]. *China Standardization*, 2022, (17):92-95.

[4] Labadi, S. Representations of the Nation and Cultural Diversity in Discourses on World Heritage [J]. *Journal of Social Archaeology*, 2010, 7(2):147-170.

[5] Zhou Xing. Folk Beliefs and Cultural Heritage[J]. *Cultural Heritage*, 2013, 2:1-10.

[6] Cedarbough T. Saeji. UNESCO on the Ground: Local Perspective on Intangible Cultural Heritage [J]. *Western Folklore*, 2017, 76.

[7] Wang Qin. Review of Research on the Protection and Inheritance of Intangible Cultural Heritage in China [J]. *Journal of Huaibei Vocational and Technical College*, 2023, 22(02):100-104.

[8] Li Dan. Research on the Problems and Countermeasures in the Protection of Intangible Cultural Heritage in China [J]. *Cultural Industry*, 2022, (13):74-76.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# Experience on promoting the pilot of implementing international standards for sustainable development of business districts in Chengdu

## 成都推进商务区可持续发展国际标准试点的经验

By Ren Yan, Deng Wen, Wen Mengchuan, Huang Hao, Yu Qiankao, Zhao Chenghong, He Huaqing
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**Abstract:** ISO 37108:2022, *Sustainable cities and communities—Business districts—Guidance for practical local implementation of ISO 37101*, is the first standard for the sustainable development management of business districts in the world. Taking Fashion & Vigor Industrial Zone of Chunxi Road and Jiaozi Park Financial Business District in Chengdu as examples, this paper elaborates on the application of ISO 37108 and shares the distinctive experience of Chengdu. It offers a comprehensive evaluation of the effectiveness of standardization in promoting the sustainable development of business districts.
**Keywords:** Chengdu, business districts, sustainable development, ISO 37108

## 1. About ISO 37108

Sustainable development is the common vision of all mankind, and standard is the universal technical language, which is an important technical means to achieve sustainable development[1]. ISO 37108:2022[2], developed by ISO/TC 268 on sustainable cities and communities, is a scientific management tool specially proposed for business districts. The standard is divided into 6 chapters, and the contents are shown in Table 1.

## 2. Pilot organization and implementation

### 2.1 Pilot implementation of technical routes

Since December 2021, Chengdu Institute of Standardization and Chengdu Association of Building Economy Promotion have set up a pilot working group to carry out the pilot verification of ISO 37108. By adopting the sustainable development management system, a large number of first-

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| Chapters | Main contents |
|---|---|
| 1 Scope | Explanation of the guidance's scope and applicable objects |
| 2 Normative references | Documents referred by this standard |
| 3 Terms and definitions | 13 terms including accessibility, business district, business environment/environment of doing business, facility, governance framework, governing body, business district organization, social responsibility, sponge city, user, smart city, resilient city, and compliance obligations |
| 4 Context of the organization | Understanding the organization and its context, understanding the interested parties in a business district, determining the scope of the management system for sustainable development of a business district, management system for the sustainable development of a business district, purposes of sustainability for a business district, and sustainability issues |
| 5 Leadership | Leadership and commitment, policy, organizational roles, responsibilities and authorities, and responsibilities for identification of sustainability issues |
| 6 Planning | Actions to address risks and opportunities, sustainable strategies and objectives and plans to achieve them, and implementation |
| 7 Support | Resources, competence of people involved in management system for sustainable development, awareness, communication, and documented information |
| 8 Operation | General, operational planning and control, and ensuring coherence of strategies, programs, projects, plans and services |
| 9 Performance evaluation | Monitoring, measurement, analysis and evaluation, internal audit, and management review |
| 10 Improvement of the management system | General, non-conformity and corrective actions, and continuous improvement |
| Annex A Suggested KPIs for management system for the sustainable development of business district | Examples of KPIs for sustainable business district during planning/design/construction and maintenance/operation stages, and suggested KPIs for buildings in sustainable business districts |
| Annex B Case studies | Provided case studies on cities in China and France |

Table 1: Main contents of ISO 37108

hand materials such as verification data and classic cases are regularly collected and analyzed to verify the applicability of international standards. See Figure 1 for the technical route of pilot implementation.

**2.2 Pilot verification point**

In order to fully verify the applicability of ISO 37108 and ensure the representativeness of the pilot, Fashion & Vigor Industrial Zone of Chunxi Road and Jiaozi Park Financial Business District are selected as the pilot verification points with a consideration of the location characteristics, functional orientation and development foundation of different business districts. As the core places of commercial activities in Chengdu, Fashion & Vigor Industrial Zone of Chunxi Road and


Figure 1: Technical roadmap for pilot implementation

Jiaozi Park Financial Business Zone have jointly formed a "dual-core" pattern of Chengdu's commercial development. See Table 2 for the comparison of the characteristics of the two typical business zones.

## 3 Pilot application

### 3.1 Context of the organization

The pilot business districts determine their respective geographical boundary, development orientation, characteristics and other organizational environments, consider the needs of all stakeholders, build a sustainable development management system covering the whole process of establishment, implementation, maintenance and continuous improvement. Fashion & Vigor Industrial Zone of Chunxi Road clearly takes "economy, sustainable production and consumption" and "culture and community identity" as its key areas of sustainability, develops three major industries: modern commerce and trade, emerging financial industry and cultural and creative industry, and forms a working mechanism of "government-led, market-oriented and professional operation". Jiaozi Park Financial Business District clearly takes "innovation, creativity and research and development", "living and working environment" and "ecosystem service" as its key areas of sustainability, and takes building a modern financial industry business district and building a world-famous park-style business district as its main goals, forming a set of policies and working mechanisms that fully reflect the timeliness of management and run through the whole process of construction and development, investment and financing, and operation management.

### 3.2 Leadership

The pilot business district defines the leading role of government management agencies with complete policy support. Fashion & Vigor Industrial Zone of Chunxi Road and Jiaozi Park Financial Business District have set up specific management agencies—Fashion & Vigor Industrial Zone of Chunxi Road Management Committee and Jiaozi Park Financial Business District Development Service Bureau[3], which are responsible for organizing and coordinating the sustainable development management system in the region, and regulating the planning, construction and operation management of the business district through policy support and administrative means.

### 3.3 Planning

According to the baseline survey and evaluation, the pilot business district defines the corresponding sustainable development policies, objectives and key performance indicators of the business district, and formulates an action

| Typical characteristics / Pilot business districts | Fashion & Vigor Industrial Zone of Chunxi Road | Jiaozi Park Financial Business District |
|---|---|---|
| Geographical location | Old city area | New city center |
| Regional characteristics | Intersection, collision, and fusion of local and international fashion elements | Core focus on finance and high-end service industries |
| Development orientation | Promoting Chengdu's local culture | Bringing international trends to the local scene |
| Present situation of sustainable development | Urban renewal, gradual transformation to meet sustainable development requirements | Completely new construction with sustainability incorporated into planning and design |

Table 2: Comparison of pilot business districts

plan to support the implementation of the sustainable development management system of the business district. Fashion & Vigor Industrial Zone of Chunxi Road and Jiaozi Park Financial Business Zone take 6 sustainable goals and 12 areas in international standards as the reference framework, build on the characteristics and internal needs of business districts, take the advanced practical experience of the sustainable development of international and domestic business districts as benchmark, fully draw on the wisdom of well-known experts and excellent teams at home and abroad, comprehensively evaluate and analyze the current situation, policy framework and organizational structure of business districts, set priority implementation items and appropriate medium and long-term development goals for their own business districts, and determine key performance indicators and expected outcomes.

### 3.4 Support

Chengdu provides supporting resources and institutional guarantee for the implementation of sustainable development in business districts. Chengdu takes the high-quality development of industrial functional zones as the starting point, makes overall allocation of natural, financial, human and technical resources needed for the work, integrates resource elements in the business district, and innovatively introduces the first city-level policy in China that supports building economy. Chengdu takes the lead in developing a number of national and local standards on terminology of building economy, grade requirements for office building and specification for safety management of office building, and introduces third-party professional and technical institutions to carry out guidance for the upgrading of commercial buildings with high standards, so as to empower the sustainable development of business districts with building economy[4].

### 3.5 Operation

The pilot business district defines its own operation plan and control measures to ensure the consistency and coherence of its strategies, projects, plans and services. Both Fashion & Vigor Industrial Zone of Chunxi Road and Jiaozi Park Financial Business Zone have established a set of long-term monitoring and supervision mechanisms covering the implementation process, implementation effect and implementation environment. At the same time, they regularly collect opinions and suggestions from relevant parties, and support control measures to ensure timely prevention, identification and correction of problems.

### 3.6 Performance evaluation

A sound performance evaluation and internal evaluation mechanism is established in the pilot business district. Chunxi Road Business Circle of Chengdu and Jiefangbei Business Circle of Chongqing have jointly released the Chengdu-Chongqing Core Business Circle Index, organized third-party professional institutions to carry out systematic evaluation on a regular basis, and provided scientific analysis and suggestions for the sustainable development of the core business circle. Relying on information technology, Jiaozi Park Financial Business District innovatively builds a digital city operation management platform that integrates all-time data, and supports the business district to analyze the current

situation, sorting out the index system, and optimizing the project plan.

**3.7 Improvement of the management system**

The pilot business district emphasizes the systematicness and scientificity of continuous improvement. Fashion & Vigor Industrial Zone of Chunxi Road and Jiaozi Park Financial Business Zone insist on benchmarking their respective objectives and tasks. According to the review results, unqualified items are pointed out for improvement, such as blind spots in the internal management system, and insufficient breakthrough ability in the development and construction. Appropriate corrective measures are formulated through discussion among relevant parties, and improvement measures are implemented in the aspects of internal system standardization, focusing on leading industries to carry out special research, and improving the overall quality of projects.

## 4 Conclusion

The Chengdu pilot verification work runs through the key links in the implementation of ISO 37108, which plays an important role in promoting the application of standards. The following lessons have been learned through the work experience.

Firstly, the working system and mechanism of the business district should be established, including the consultation mechanism between urban government departments to centrally dispatch and use resources, strengthen the whole process tracking of regional planning, construction and operation, and multi-departmental and multi-professional collaboration. The requirements for public participation and dynamic management and control should also be specified.

Secondly, the sustainable development of business districts should be guided by standardized means, the promotion of standardization concepts and the dissemination of standard knowledge should be strengthened, and all stakeholders should be mobilized to jointly promote the application of standards to effectively improve the management efficiency of business districts, thus realizing sustainable development.

Thirdly, the first city-level policy in China that supports building economy should be formulated with the development of a series of key standards on building economy. The Chengdu experience and model of building economy that can be replicated and promoted, so as to promote the high-quality development of business districts with the standardization of building economy.

## References

[1] YANG Feng. Analysis of the Development of ISO City Sustainable Development Standardization and the Functions [J]. *Standard Science*. 2019(8):6-10+16.

[2] ISO 37108:2022, *Sustainable cities and communities—Business districts—Guidance for practical local implementation of ISO 37101* [S]. 2022.

[3] Interim Measures for the Administration of Financial Business District of Jiaozi Park in Chengdu [J]. *Official Gazette of Chengdu Municipal People's Government*, 2020(12):9-11.

[4] Ren Yan, Wen Mengchuan, Lu Xuehui, et al. Exploration of Innovation Practice of Building Economy Services Standardization—Taking the Innovative Development in Chengdu as an Example [J]. *Standard Science*, 2018(12):122-125.

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# Overview of quality supervision and standards system for electric motors in China

## 中国电动机质量监管及标准体系概述

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**Abstract:** This paper systematically analyzes the product quality supervision methods in China, introduces the main functions of market regulation departments and the product supervision and random inspection process, and introduces the channels for feedback on consumers' quality and safety problems, the online platform for consumer problem disposal. It also summarizes the main standards categories and standards systems for electric motors in China, and the standards and key inspection items for supervision and random inspection.
**Keywords:** electric motor, quality supervision, supervision and random inspection, standards

## 1. Introduction

The electric motor industry in Asia has achieved rapid growth in the past decade, and it is growing into an important gathering place for global electric motor production. In Japan and South Korea, continuous improvement of products and processes has become an important tool for business competition. Some motor industry clusters in China are actively upgrading their existing motor industry chain, accelerating innovative development, and improving production models to increase the production capacity of high-quality and efficient motors. The Chinese government actively leverages its regulatory advantages, strengthens and innovates quality supervision, and effectively promotes the transformation and upgrading of the electric motor industry. Well-known motor manufacturers in China have completed the standardization construction of quality management, and the standards system has covered the entire production process. Professional associations and technical standards effectively promote the development of electric motor industry. Stricter product standards have been developed and implemented, and the market potential for electric motor products is increasing day by day.

Since 2015, China's electric motor industry has shown a good development trend, the export volume is increasing year by year. Even during the COVID-19 epidemic, it still maintained a growth trend[1]. According to data from the China Association of Automobile Manufacturers, in the field of new energy vehicles, the installed volume of permanent magnet synchronous motors accounts for over 94%. It is expected that the market space for new energy passenger vehicle drive motors will reach 38.5 billion yuan by 2025[2]. In addition, there is still a significant market demand for mid to low-end electric motors in China.

## 2. Analysis of China's electric motor quality supervision

### 2.1 Development of quality supervision

The basic regulation for product quality supervision is the *Product Quality Law of the People's Republic of China*, which stipulates the requirements for supervision and management of product quality, the product quality responsibilities and obligations of producers and sellers, compensation for product quality damage, and related punishment measures. The *Regulations of the People's Republic of China on the*

*Administration of Industrial Product Production Licenses* is the earliest product quality assurance regulation in China. With the continuous improvement of the product quality management system and industrial product quality, the management catalog has been reduced from 487 types[3] to 10 major categories of 38 products. Some categories of explosion-proof motors were once under the scope of production license management, and now motor products are no longer in the management catalog.

In 2003, the *Regulations of the People's Republic of China on Certification and Accreditation* was promulgated. Compulsory Product Certification Management Regulations was implemented in 2001, specifying the certification system as China Compulsory Certification (CCC). Small power motors for driving purposes with a rated voltage greater than 36 V (effective value of DC or AC), less than 1500 V DC or 1000 V AC, and a maximum continuous rated power not exceeding 1.1 kW when the speed is converted to 1500 r/min, must pass mandatory safety certification.

In terms of energy consumption, China has formulated the *Energy Conservation Law of the People's Republic of China*, implemented energy-saving product certification. This certification is a mandatory certification, and the corresponding product catalog is nonscheduled expanded and released. According to the *Energy Efficiency Labeling Management Measures*, relevant products are subject to energy efficiency labeling management. The current energy-saving product management catalog includes 44 categories of products, including small and medium-sized three-phase asynchronous motors and permanent magnet synchronous motors.

### 2.2 Quality supervision agencies and their functions

In China, the market regulation departments are mainly responsible for product quality management, which are divided into national level, provincial level, municipal level, and county level according to the jurisdiction. Market regulation departments at all levels are responsible for comprehensive market supervision and management; registration of business entities; market supervision and comprehensive law enforcement work; product quality and safety supervision and random inspection; product quality and safety risk monitoring; industrial product production licenses; metrology, standardization, testing, and certification and accreditation work.

### 2.3 Supervision and random inspection of electric motor products

Supervision and random inspection are an important measure for China to supervise product quality, which involves random sampling and inspection of products in the production and sales sectors, and processing based on the inspection results. Supervision and random inspection can be broadly divided into two categories. One type is national supervision and random inspection, which are organized and implemented by the State Administration for Market Regulation; another type is local supervision and random inspection, which are organized and carried out by local market regulation departments at or above the county level. In the field of production and sales, the key motor products under the supervision of market regulation departments at all levels are low-power motors and three-phase asynchronous motors. The key inspection indicators for electric motors include electrical safety, mechanical performance, and energy consumption level. Market regulation departments at all levels will release information based on the inspection results, and impose penalties on enterprises that fail in the inspection according to the *Supervision and Random Inspection Management Regulations*. Unqualified inspection results will be recorded in a unified credit management system, which will have a significant impact on a company's credit.

### 2.4 Analysis of quality issues in spot checks of electric motors

The unqualified items discovered during the supervision and spot check of low-power motor products are mostly related to nameplate identification and electrical safety, such as non-standard identification of the inspection unit and line end, and poor durability of the nameplate. In terms of electrical safety, such as clearances or creepage distances less than the specified value, connection to the supply network or cable anchorage problems, and lack of fastening measures.

As shown in Figure 1, there are electrical safety hazards between the enameled wire of the internal winding of a low-

Figure 1: Schematic diagram of winding, iron core, and metal frame structure

power motor and the iron core and metal frame. An effective way to ensure electrical safety is to increase the length of the insulation sleeve. Another method is to apply insulation paint on the iron core that passes through the winding wire and the metal material surface connected to the metal shell that has been touched, which is difficult to ensure sufficient electrical clearance.

During the supervision and random inspection of small and medium-sized electric motors, unqualified items often occur, such as rotational direction, limits of temperature rise, efficiency, etc. Some motors are difficult to operate stably during the testing process. Under rated operating conditions, ordinary motors can reach stability after running for 1.5 hours, and the range of input power fluctuations is relatively small after stable operation.

The reliability of stable operation and line connection, the load capacity of the motor, and the heat dissipation of the motor are related factors. It is recommended to use hard crimping or welding connection between the internal winding and the lead wire of the motor. Most motor wiring terminals only provide one gasket. When connecting to external power lines, some manufacturers' motor product wiring terminals cannot guarantee reliable connection with O-shaped wiring terminals, as shown in Figure 2. It is recommended to improve the design at the wiring terminals to ensure effective connection. Reliable electrical connections can effectively improve the operational stability of the motor.

In order to achieve the specified shell protection level, the finished motor products are usually sealed at the shaft end when leaving the factory. The conventional method is to add a soft plastic or rubber material sealing ring. In the specific inspection process, it is found that the efficiency difference of the motor before and after removing the sealing ring can reach more than 1%. When the inspection specification does not require the detection of the motor protection level, it is recommended to remove the sealing ring from the sampled motor.

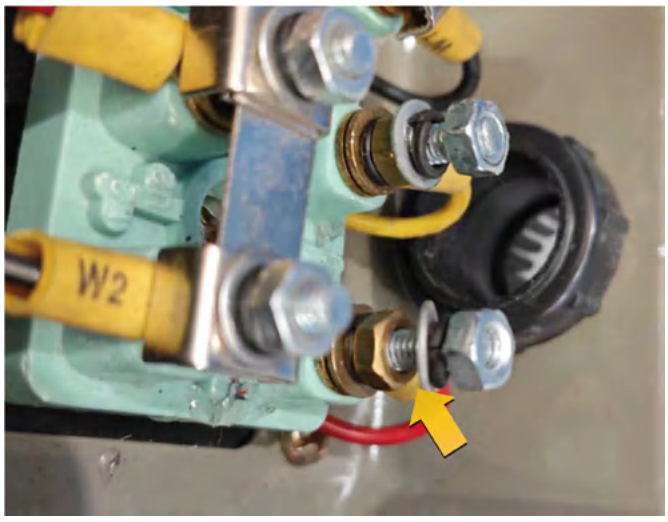

Figure 2: Schematic diagram of power line wiring terminals

**2.5 Transmission and processing of quality and safety information**

The Chinese government pays special attention to product quality and safety. If consumers encounter product quality problems, they can turn to the local market regulation department through phone or email, or call the "12315" consumer complaint hotline. They can also conveniently provide feedback, make consultation and complain, and report related product quality problems or violations through the online platform of www.12315.cn. China has established a complete e-government system, allowing individuals or enterprises to complete various administrative approval or appointment processing services online.

## 3. Analysis of China's electric motor standards system

There are many types and a large number of standards related to electric motors. They are divided into national standards, sectoral standards, local standards, and association standards according to their application and coverage. Many companies will develop standards based on their own technological development needs, and many companies will directly adopt international standards such as IEC standards. The relevant standards for electric motors based on the different coverage ranges of the standards are analyzed here.

**3.1 National standards**

National standards are the most widely used fundamental standards in the quality supervision process, which are published by the Standardization Administration of China. The national standards (GB) are divided into mandatory standards (GB) and voluntary standards (GB/T). In order to ensure the quality and safety of electric motor products, national standards have detailed provisions on the classification, technical requirements, testing methods, and other requirements of electric motor products. The important national standards are shown in the Table 1.

The three national standards GB/T 12350, GB/T 14711, and GB 18613 are most widely used in the field of electric motors. GB/T 14711 was released in 2013, and the structure of the standard, requirements for certain components, and testing methods need to be improved. GB 18613 is the energy efficiency standard for electric motors, and its speed range division is different from the corresponding IEC standard, in which some energy efficiency limits are higher than the IEC standard.

| No. | Standard Number | Name | Type* |
|---|---|---|---|
| 1 | GB/T 14711-2013 | *General requirements for safety of small and medium size rotating electrical machines* | a |
| 2 | GB/T 12350-2022 | *Safety requirements of small power motors* | a |
| 3 | GB 18613-2020 | *Minimum allowable values of energy efficiency and values of efficiency grades for motors* | a |
| 4 | GB 30253-2013 | *Minimum allowable values of energy efficiency and energy efficiency grades for permanent magnet synchronous motors* | a |
| 5 | GB 30254-2013 | *Minimum allowable values of energy efficiency and the energy efficiency grades for cage three-phase high voltage induction motor* | / |
| 6 | GB 755-2019 | *Rotating electrical machines—Rating and performance* | a |
| 7 | GB/T 1311-2008 | *Test procedure for direct current machines* | / |
| 8 | GB/T 5171.21-2016 | *Small power motors—Part 21: General test methods* | b |
| 9 | GB/T 9651-2022 | *Test methods for single-phase induction motors* | b |
| 10 | GB 1032-2023 | *Test methods for three-phase asynchronous motors* | b |
| 11 | GB/T 14481-2008 | *Test procedure for single-phase synchronous machines* | b |
| 12 | GB/T 1029-2021 | *Test procedures for three-phase synchronous machines* | / |
| 13 | GB/T 22670-2018 | *Test procedures for converter-fed three phase cage induction motors* | / |
| 14 | GB/T 13958-2022 | *Test methods for small power permanent magnet synchronous motors* | b |
| 15 | GB/T 10069.3-2008 | *Measurement of airborne noise emitted by rotating electrical machines and the noise limits—Part 3: Noise limits* | a |
| 16 | GB/T 10068-2020 | *Mechanical vibration of certain machines with shaft heights 56 mm and higher—Measurement, evaluation, and limits of vibration severity* | a |
| 17 | GB/T 4831-2016 | *Specification for model of rotating electrical motor* | / |
| 18 | GB/T 18488.1-2015 | *Drive motor system for electric vehicles—Part 1: Specification* | / |
| * a-Quality supervision random inspection reference standard<br>b-Indirect reference standard | | | |

Table 1: Main national standards on electric motors

Small and medium-sized electric motors combined with low-power electric motors are the key categories of motor products under supervision in China. The important test items to be inspected include markings and instructions, junction boxes and wiring devices, grounding, rating tests, thermal tests, contact current, insulation resistance, vibration, noise, and efficiency.

### 3.2 Sectoral standards

Sectoral standards are managed by the relevant departments of the State Council of China, and they are uniformly used within a certain industry[4]. Sectoral standards are mainly used for products in a specific industry or field, and are generally voluntary standards. These standards usually specify the type parameters, technical requirements, inspection methods, and marking packaging of the motors. Common sectoral standards for electric motors include JB/T 13299, *Specification for YE4 series (IP55) three-phase induction motors (frame size 80~450)*, JB/T 13297, *Specification for TYE4 series three-phase permanent synchronous motors (frame size 80~355)*, JB/T 1012, *Technical specification for YY series permanent-split capacitor asynchronous motors*, and JB/T 13729, *High-efficiency three-phase asynchronous motor in ships*. In the field of electric motors, sectoral standards generally belong to product standards, and they have high recognition and wide application.

If the motor nameplate or instruction manual clearly indicates the standard it conformed, which is a voluntary sectoral standard, it will become a mandatory standard when conducting supervision and random inspection on such motors. They must meet the requirements of the indicated standard.

### 3.3 Local standards

Local standards meet the needs of provincial administrative management, and they can be formulated with the approval of the provincial standardization administrative departments[5]. China's market supervision and management department continues to promote standardization reform, the main role of local standards is shifting towards guiding the economic and social development of the local area, gradually eliminating mandatory requirements for industrial products. The local standards related to electric motors developed by various provinces are not used as the basis for product quality supervision.

### 3.4 Association standards

Association standards are developed by industry associations, business alliances, or social organizations for common benefits. The development of association standards is more flexible and can better adapt to the needs of industry development[6].

The association standards related to electric motors include T/CEEIA 380, *Technical specifications for green-design product assessment—Small-power motor*, T/CEEIA 410, *Technical specifications for green-design product assessment—AC motor*, and T/CAGP 0042 (T/CAB 0042), *Technical specification for green-design product assessment—BLDC motor for roller washing machine*. For motors to pass green design product certification, they must meet the corresponding green product standards. These widely used association standards are developed to guide industrial development and provide a basis for government regulation of industrial development.

## 4. Conclusion

China has established a relatively complete legal system, attached great importance to product quality, and conducted legal supervision and management of product quality. On the basis of meeting development needs, China's electric motor standards system emphasizes the research on international standards. By establishing a reasonable regulatory system and a sound standards system, China's electric motor industry can develop in a healthy and orderly manner.

## References


[1] Wu Longquan. Analysis of the Current Development Status and Strategic Research of China's Electric Motor Industry [J]. *China's strategic emerging industries*, 2022(5):23-25.

[2] CAAM. Market outlook for new energy drive motors [EB/OL]. [2015-12-30]. http://www.caam.org.cn/chn/38/cate_427/con5235596.html

[3] Zhu Jun. *Research on Industrial Production Administrative Approval System* [D]. Hebei: Hebei University of Technology, 2013.

[4] LI Yanzhuo. Research on Formulation of Industry Standards [D]. Liaoning: Dalian University of Technology, 2018.

[5] Cao Yongsheng, Zhao Min. Construction and Exploration of Local Standard Management System [J]. *China Standardization*, 2023(17):108-112.

[6] Yang Xiaofeng, Zhang Ying, Li Yao. Analysis of Key Technologies for Association Standard Optimization [J]. *China Standardization*, 2023(16): 22-26.


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