

Revised Law to Boost Science Popularization

Policy

By WANG Manxi

A collective interview on China's Science and Technology Popularization Law was held on January 15, with officials giving detailed interpretation of the revised law issued in December 2024.

The revised law makes detailed provisions on promoting science popularization of emerging technologies, which helps improve public understanding of science and the application of new technologies.

Understanding new technologies

The sci-tech revolution and industrial transformation are changing the way people live and work. With the development of new technologies such as AI, big data and cloud computing, China's economy and society are undergoing comprehensive digital transformation. This makes the understanding of new technologies by society essential.

The revised law stipulates that when the country plans and implements major scientific and new technology projects, it needs to arrange intensive sci-tech outreach activities to ensure public understanding, recognition and support.

The law encourages a wide range of innovation projects to carry out science popularization around new technologies and new knowledge, encourages the application of new technologies in science popularization, and guides society to understand and use sci-tech achievements correctly.

Using web tech to popularize science

Shi Hong, an official of the Legisla-



The special effects cinema of the Beijing Science Center screens science films, providing the public with an immersive environment. (PHOTO: VCG)

tive Affairs Commission of the National People's Congress Standing Committee, said that one of the highlights of this revised law encourages the use of emerging media to carry out science popularization, and expanding the channels and means of science popularization.

The development of network-based information technology has brought new application scenarios for science popularization and science communication.

The Internet platforms provided important communication channels for science popularization.

According to Gu Yanfeng, deputy director of the science popularization department at the China Association for

Science and Technology (CAST), CAST will leverage the role of China Science Communication, a national science popularization information platform, to strengthen cooperation and interaction with various media and platforms, and promote the public sharing of high-quality science popularization resources through various channels such as live broadcasting, short videos, and virtual reality (VR).

New technologies such as VR and AI provide opportunities for the exhibition design and display of science and technology venues. The China Science and Technology Museum uses modern digital technology to build multiple VR immersive exploration exhibition areas and immersive digital

art space exhibition areas to enrich visitors' experience.

Creating a science popularization industry system

The revised law stipulates that the country shall develop the science popularization industry and encourage the establishment of science popularization enterprises.

Li Xin, an official from the Ministry of Science and Technology, said that it is necessary to form a complete chain of science popularization industry system such as creation, R&D, design, manufacturing and exhibition, promoting the development of the science popularization industry to meet the demands of economic and social development and the expectations of the public.

Report Highlights Global Energy Collaboration, Sustainability

By LONG Yun & LI Zhe

On January 21, the China National Petroleum Corporation Economics and Technology Research Institute (CNPC ETRI), a leading think tank in China, released its 17th annual report on the development of the global oil and gas industry. The report, *Oil and Gas Industry Development: 2024 Review and Outlook*, highlights the complex yet resilient global energy landscape.

It has a special focus on international cooperation and the green transformation of the energy sector, outlining the future trends that will shape the global oil and gas market.

Under the theme "Seeking Energy Balance Amid Stability and Change," the research team shares key insights into

the evolution of the industry, predicting that 2025 would usher in a new phase of "seeking stability amid change." As technological innovations redefine global energy strategies, China's role in securing energy stability and advancing sustainable practices remains pivotal.

In 2024, China's energy consumption increased by four percent, while global primary energy consumption grew by 1.9 percent. The transition towards cleaner energy is accelerating. China's green energy transformation continues to lead the world.

One of the most significant aspects of the report is its analysis of global oil prices, which saw a slight decline in 2024. The development of alternative energy sources, including electric vehicles and LNG-powered trucks,

contributed to a 1.7 percent reduction in refined oil consumption. This shift is indicative of the broader trend toward green technologies, which will continue to redefine global energy consumption patterns.

A highlight of the event was the introduction of the Energy Data Handbook, a comprehensive compilation of energy statistics developed by CNPC ETRI, a valuable resource for governments, businesses, and researchers seeking to understand the evolving dynamics of global energy markets. The handbook provides a detailed and forward-looking analysis of global and Chinese energy consumption, production, trade, prices, and transitions from 2000 to 2024.

The report also reflects on China's

efforts to build strategic partnerships in line with its commitment to international collaboration. The country's oil and gas companies have made significant strides in overseas cooperation, introducing innovative collaboration models that combine large-scale projects with more agile, smaller initiatives.

Qian Xingkun, executive director of the CNPC ETRI, expressed the hope that the reports would provide valuable insights for policymakers in making informed decisions, assist energy companies in their strategic planning, help investors understand industry trends, and offer research institutions a solid foundation for further studies.

This article was edited based on the original version by the CNPC ETRI.



Virtual and Physical Prototyping: Rise of Asia's Additive Manufacturing

By Chua Chee Kai

In the early 2000s, the Internet revolutionized global competition, shifting it from local to international. Product lifecycles shortened, requiring quick market entry for new items, and the industry moved from mass production to mass customization. Academic research increasingly focused on the value-adding processes in new product development.

To facilitate scholarly exchange, Paulo Bártolo, then head of the mechanical engineering department at the Polytechnic Institute of Leiria, Portugal, organized the 2003 International Conference on Advanced Research in Virtual and Rapid Prototyping (VRAP). The conference brought together researchers across virtual and physical prototyping, and the second VRAP followed two years later. Inspired by its success, Paulo conceived the idea of a new journal, *Virtual and Physical Prototyping (VPP)*, and I am honored to be invited as co-editor-in-chief.

The inaugural VPP issue in 2006 featured five papers, a strong start for a new journal. Field-specific journals often struggle with low submissions, inconsistent quality, and editorial delays, all of which can burden editors heavily. Many failed early but VPP thrived. VPP published four issues annually, with Paulo and I alternating editorial duties and co-writing the editorial for every edition.

Persevering through storms

VPP faced challenges after the rise of 3D printing. ASTM F42 and ISO TC261 jointly published standard terminology, making "additive manufacturing" the official term for layer-by-layer fabrication. This rendered terms like virtual and physical prototyping, rapid prototyping, and solid freeform fabrication obsolete, except for 3D printing, which remains popular for its simplicity and public recognition.

This terminological shift diminished VPP's visibility. We considered renaming it but decided to retain the original name, believing that journal quality mattered more than its title. With the support of Paulo and our colleagues in Portugal and Singapore, VPP weathered this crisis.

Revitalizing by reform

The field of additive manufacturing is expanding globally, yet our journal remains focused on new product development, as does the editorial board. To enhance the journal's quality, we recognized the need for a refreshed editorial board.



Chua Chee Kai. (COURTESY PHOTO)

In 2015, we expanded the board by bringing in new experts in additive manufacturing, ensuring a balanced geographic representation. Thanks to the new editorial board, VPP was accepted into the Emerging Sources Citation Index in 2018, a milestone towards Science Citation Index. After the reform, Paulo stepped down as founding editor, anticipating a rise in Asian submissions. With my stronger ties to Asia, the alternating editorial approach changed, and I became VPP's sole editor-in-chief.

Prospering in new norm

The year 2020 was a milestone for VPP. In June, we received our first impact factor, which led to increased global submissions. However, the trend shifted from the West to the East, with China surpassing the U.S. and the UK to contribute over half of VPP published papers.

This reflects not only the growing additive manufacturing community in China but also its R&D strengths. Today, we have seven editorial board members from China, representing the western, southern, eastern, and central regions, with northern candidates under consideration.

VPP has evolved through several phases, witnessing the development of scientific research in China. What will be the next development for VPP?

While I don't have a definitive answer yet, I am confident that China's additive manufacturing community, along with additive manufacturing communities worldwide, will play a crucial role in shaping the future.

The author is the editor-in-chief of VPP, fellow of the Singapore Academy of Engineering, and associate provost for research at the Singapore University of Technology and Design.

No Network, No Problem

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In remote areas where ground network stations are sparse, the team refined their technology to enable seamless switching between ground and satellite networks, achieving reliable two-way voice calls and messaging.

Bridging two networks

Satellite phones are often bulky and cater to a niche market, limiting their appeal. Even with satellite connectivity, smartphones needed to integrate with existing phone numbers to gain traction.

"If users can make satellite calls us-

ing their original numbers, it will unlock a vast untapped market," said Li Yihuan, director of China Telecom Satellite Application Technology Research Institute.

Unifying the protocols of satellite and ground networks was no small feat, requiring new development, revisions,

and supplementary agreements.

In August 2023, Huawei launched the Mate 60 Pro, marking the commercial debut of this groundbreaking technology. "We will continue to innovate, using digital technology to create new industries and empower better lives," said Li.

China-CELAC Forum Marks Decade of Ties

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Key initiatives include the China-LAC Sustainable Food Innovation Center and the China-LAC Technology Transfer Center, which foster innovation and knowledge sharing.

China and Argentina's joint deep space exploration station has supported missions like Chang'e 4 and Tianwen-1,

while the China-Brazil Earth-Resources Satellite helps safeguard the Amazon rainforest and exemplifies South-South cooperation. Technologies such as blockchain, fintech, and digital twins are also bolstering Latin American startups, creating significant societal impacts.

Strengthening people-to-people ties

Over the decade, cultural exchanges

under the framework have also flourished, deepening mutual understanding. This has led to the expansion of Chinese language programs, with 57 Confucius Institutes or Classrooms established in 26 Latin American countries.

China has also sent medical and agricultural experts to the region, promoting

"small and beautiful" livelihood projects like growing bamboo and mushroom grass, contributing to local development and revitalization.

As the forum celebrates a decade of progress, its initiatives continue to strengthen the cooperation between China and LAC countries, fostering shared growth and innovation.

Journal Review

VPP is a leading publication in the interdisciplinary field that merges computer science, mechanical engineering, materials science, and other related disciplines. As the manufacturing sector advances through digitalization and intelligent technologies, this field has become a focal point for innovation and research, both in academia and industry, on a global scale.

VPP's prominence reflects its significant role in shaping discourse within this evolving domain, attracting substantial contributions and citations from researchers worldwide and establishing its influence in the international academic community.

Through the dissemination of high-quality research articles, VPP provides an essential platform for scholars to share their findings. The high standards set by the journal also serve as a catalyst for researchers to

enhance the rigor and impact of their work, fostering deeper exploration and advancement within the field.

In China, the rapid development and digital transformation of the manufacturing industry have catalyzed growing interest among researchers in virtual and physical prototyping technologies. Chinese institutions are increasingly collaborating with prestigious international partners on joint projects and educational programs. This enhanced cooperation has resulted in a notable rise in submissions from Chinese academics, making the journal a vital link between the Chinese and global academic communities.

— Lu Bingheng, an academician of the Chinese Academy of Engineering, a professor at the Xi'an Jiaotong University and the director of the National Innovation Institute of Additive Manufacturing.