# Pilot Program to Scale Up Hydrogen Energy Usage

**Policy Express**

By TANG Zhexiao

The Ministry of Industry and Information Technology (MIIT), along with the Ministry of Finance and the National Development and Reform Commission has jointly launched an initiative to pilot the comprehensive application of hydrogen energy, proposing to drive innovation in hydrogen technologies and equipment.

The initiative aims to scale up hydrogen energy for urban application across diverse fields by 2030, with the average price of terminal hydrogen expected to drop below 25 RMB per kilogram, and to around 15 RMB per kilogram in some advantageous regions, while the national ownership of fuel cell vehicles is projected to double that of 2025, reaching 100,000 units.

By expanding the scale of application, breakthroughs in hydrogen energy technologies, processes and equipment will escalate to facilitate the iterative upgrading of fuel cells, electrolysers, storage and transportation systems, and materials. The resulting plan is to promote hydrogen energy as a new driver of economic growth, supporting a comprehensive green transition in economic and social development.

Workers conduct safety inspections in a hydrogen refueling station in southwest China's Chongqing. (PHOTO: XINHUA)

This pilot initiative will expand hydrogen energy applications from a single scenario of fuel cell vehicles to diversified sectors, including transportation and industry, and build a "1+N+X" integrated application ecosystem. Within this framework, "1" represents the general scenario of fuel cell vehicles, "N" indicates application scenarios in the industrial sector, and "X" refers to innovative application scenarios.

Five urban clusters will be selected based on their merits and each pilot period will last for four years. Financial support in the form of grants, with an upper limit of 1.6 billion RMB for a single pilot city, will be made available and the funds will be specifically used for comprehensive hydrogen energy applications.

Furthermore, pilot cities are encouraged to actively introduce supportive policies in the R&D of key technical equipment in hydrogen production, storage, transportation and utilization. The cities are also encouraged to improve coordination between fiscal and financial policies. Meanwhile, enterprises are encouraged to create conditions that align with policies such as interest subsidies on loans for service sector operators, thereby providing diversified financial support for pilot projects on the comprehensive application of hydrogen energy.

Additionally, the policy and institutional environment will be upgraded to encourage the introduction of facilitative measures — such as enabling the inter-city transit of fuel cell vehicles.

China's hydrogen energy industry has achieved several breakthroughs, entering a critical phase of a rapid and large-scale development.

By the end of 2025, the cumulative sales of hydrogen fuel cell vehicles in China reached close to 40,000 units, with 574 hydrogen refueling stations constructed and a daily refueling capacity exceeding 360 tons, ranking first globally.

The pilot program aims to drive down costs through large-scale, multi- scenario applications, facilitate breakthroughs in hydrogen technology and equipment innovation, and promote the high-quality development of the hydrogen industry.

# Tech-industry Integration Propels Manufacturing Upgrade in Kaifeng

**Case Study**

By YAO Yian & SUN Yue

The city of Kaifeng in Henan province, central China, focuses on key industrial chains such as automobile manufacturing, modern food and biomedicine driven by innovation.

To do this, the city has implemented a series of targeted measures, including building innovation platforms, tackling technological bottlenecks, promoting the commercialization of R&D achievements, and strengthening innovation entities.

At a recent high- quality development conference in Kaifeng, Henan Lixing Yiyuan Food Co., Ltd. (Lixing Food) shared its experience of going global with its signature sour- and- spicy vermicelli products via technological innovation.

In 2025, Lixing Food, in response to market demand at home and abroad, developed more than 20 new products and extended the shelf life of its sour- and-spicy vermicelli by 30 percent through technological innovation. Sun Qingxin, chairman of Lixing Food, said the company will continue to ramp up R&D investment to take Henan's sour- and-spicy vermicelli to the global market.

The dividends of sci- tech innovation have been effectively translated into tangible development results for the enterprise.

Kaifeng's three- year action plan is advancing innovation- driven development and accelerating the formation of new quality productive forces. From building high- level sci- tech innovation platforms to strengthening the principal position of enterprises in innovation, the city has taken all-round measures to facilitate in-depth integration of sci-tech and industrial innovation.

The year 2025 proved remarkably fruitful for Kaifeng's sci-tech innovation platforms. A total of 23 new provincial-level innovation platforms were approved, and 55 new municipal- level innovation platforms were established.

The number of Zhongyuan Scholar Workstations, where distinguished experts lead research teams to solve technical challenges, facilitate technology transfer, and cultivate local scientific talent, rose to six. The Songdu Laboratory, focusing on technological innovation and industrial application, was put into operation.

Breakthroughs were also made in sci-tech research projects: 313 municipal-level sci- tech plan projects were launched, nearly 40 sci-tech projects at or above the provincial level were approved, and a stream of original and disruptive technological achievements emerged, laying a solid technological foundation for the city's industrial development.

Kaifeng is also boosting corporate innovation through expanded financial support and faster commercialization of research achievements. In 2025, the city issued over 1.5 billion RMB in innovation-focused loans, and hosted 11 branded events to drive the transfer of advanced technological outcomes.

Its annual technology contract transaction volume surpassed 10 billion RMB for the first time, as the commercialization of local sci-tech results continues to gather pace.

# Giant 'Power Bank' Lights Up E. China

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The team then developed a temperature control model for the dam, accurately predicting stress resulting from temperature changes. The 62.5- meter-high, 566-meter-long dam remained resilient, with leakage at just one-tenth of the designed limit — a remarkable achievement in China's pumped storage sector.

***Forging a "super slide"***

The team's next challenge was safely channeling water from the upper reservoir to the underground powerhouse. Two massive steel- lined inclined shafts — each 483.4 meters long with a steep 58-degree slope — were required, and these "super slides" had to withstand extreme pressure from the 724-meter water head.

At the time, the hydropower steel made in China could withstand a maximum of 800 MPa. Given the choice between expensive imports and seizing the opportunity for innovation, the team resolved to develop 1,000 MPa high-strength steel.

The initial phase was tough. After two years, steel samples from five mills failed to meet requirements. Undeterred, the team visited the rolling mills, analyzing processes and adjusting alloy compositions until the first qualified plate was produced. However, the qualification rate for mass- produced steel plates was less than 50 percent. Inaccurate control of heat treatment was subsequently identified as the problem.

Through intense research and expert consultations, they refined the entire heat treatment process: ensuring uniform furnace temperature, precisely controlling the atmosphere, and standardizing cooling. With each improvement, the qualification rate soared to 92 percent. "This marked China's true mastery of 1,000 MPa steel manufacturing," said Yao Liang, deputy general manager of Zhejiang Tiantai Pumped Storage Co., Ltd.

Today, this domestically produced steel forms the core of the station's water conveyance system.

***Installing the "giant heart"***

The rushing water finally hit the reversible pump-turbine units in the underground powerhouse — the "giant heart" of the station. It pumps water uphill to store energy and reverses to generate power.

Precision installation was critical. With 481 tons in weight and 4.996 meters in diameter, the rotor demanded a center deviation of less than 0.1 mm and a level deviation within 0.02 mm. "Even a 0.01 mm error could affect efficiency and lifespan," said Qiang Linlin, a project engineer.

During the vertical hoisting, monitoring screens showed a gap in the concentricity curves, suggesting a potential slight tilting of the rotor. The operation was immediately stopped. Visual inspection was inadequate. Recalling a 3D laser positioning instrument used during construction, the team used it as a monitor in the pit bottom.

With this dual guidance, the operator carefully adjusted the angle. After 30 minutes, the rotor settled perfectly into place, with a center deviation of 0.05 mm and level deviation of 0.01 mm.

The construction of the power station has now entered the fast lane. The first unit went live in December 2025, the second in January 2026, and all four are expected to be operational by September 2026.

# BFA Injects Stronger Impetus into Regional Development

*From page 1*

"Asia's green transition, particularly energy transition, is deepening and positioning the region as a spearheading global force," said Li Baosen, deputy secretary- general of the Global Energy Interconnection Development and Cooperation Organization.

China has become a global leader in robotics and green energy, sectors that are not isolated but foundational layers for the future economy, Jack Perry, chairman of The 48 Group, has said.

These initiatives will build long-term cooperation platforms for governments, enterprises and research institutions across the region.

China's commitment to multilateralism, free trade and inclusiveness offers crucial strategic stability to a world marked by market volatility and growing protectionism, Denis Depoux, global managing director at the Munich-based Roland Berger, said.

**Global Journal Observatory**

# Horticulture Research: Decoding 'Beauty and Flavor' of Life

By CHENG Zongming

In the minds of many, horticulture seems to be the leisure art of tending to flowers and plants or savoring fruits and vegetables. However, under the scientist's microscope, the fragrance of the rose or the sweetness of the strawberry is underpinned by complex genomics and biotechnology. This is the realm *Horticulture Research* has focused on: decoding the "beauty and flavor" of life through cutting-edge science.

***Cultivating a healthy academic ecosystem***

Since *Horticulture Research*'s launch in 2014, we have set a clear mission: to publish a high- level journal and, more importantly, to cultivate a vibrant global horticulture ecosystem, offering scholars worldwide a platform to showcase their work and exchange ideas.

In the early days, to ensure this Chinese university- hosted journal integrated into the international mainstream, I traveled frequently among universities and institutions in China, the U.S. and Europe. In 2016 alone, I chaired and attended 15 academic conferences and visited nine universities and research institutions to solicit manuscripts, and promote the journal's philosophy. Through this process, I realized that what scientists crave most is not just publishing papers, but in- depth academic exchange and international collaboration to advance horticultural science.

Therefore, we began to undertake several "extra duties." We started the International Horticulture Research Conference, which has become a premier academic event for fundamental research in global horticulture. It has been held 12 times across China, the U.S., the UK, Italy and beyond.

On this platform, scholars discuss face- to- face topics like how to enhance tomato storage and transport by gene editing, determine apple maturity using non- destructive testing, and extend the blooming period of flowers via molecular breeding. The synergy between the journal and the conference has transformed *Horticulture Research* from a publication into a multidimensional, warm community of scientists.

We also host regular online academic exchanges for our authors to share insights and discuss their papers, ensuring that young scholars and students can benefit from these exchanges.

***An objective academic gatekeeper***

As a frontline scholar, I intimately understand the anxiety and anticipation in the submission process. Therefore, we have an "author-centric" service philosophy. We do not look at the authors' "titles" or the prestige of their affiliated institutions; we judge research only by its scientific value.

One event left a deep impression on me. In 2024, a young scholar submitted a manuscript detailing his discovery of a highly significant and novel gene controlling the prickle trait in Solanaceae plants. After peer review, the journal accepted it.


Front cover of Horticulture Research, Volume 13, Issue 1. (COURTESY PHOTO)

However, after the manuscript was pre- published online, it was questioned by a senior American scholar, who claimed that some of the experimental data was unreliable. We immediately organized a rigorous professional review; through strict evaluation by the editorial board, it was determined that the data were solid, the conclusions were reliable, and the accusations were unfounded. The paper was thus published as scheduled.

A month later, this senior scholar published similar findings on the gene in another journal. This convinced me that the courage to endorse innovation based on professional judgment is the key to earning the respect of international peers. I also realized that fair academic competition requires impartial editors-in-chief and journals, rather than being obsessed with identity and status. This is what constitutes a healthy academic ecosystem.

***Forging the link from basic science to the dining table***

Today, *Horticulture Research* has grown into a reputable journal in global horticulture. Its submissions cover China, the U.S., the UK, Italy, Spain and the Netherlands.

Its latest impact factor is 8.5, and its Journal Citation Indicator is 2.34, both ranking first in the field. The number of annual published papers has grown from over 30 in the early days to more than 300 today.

Yet, this is far from the endpoint. By publishing horticultural research findings, we aim to bridge basic science and the horticulture industry so that people enjoy more nutritious fruits and vegetables, better tea and coffee, and more beautiful flowers, ultimately contributing to a better quality of life for all.

*The author is the editor-in-chief of Horticulture Research.*

## Journal Review

As a foundational platform in horticulture, *Horticulture Research*, through its rapid development, has stimulated academic vitality and expanded the field's global influence.

The journal upholds rigorous publishing standards, and serves and unites the global scientific community. By organizing high-level academic events such as the annual International Horticulture Research Conference, it has forged a dynamic academic hub that fosters idea exchange and collaborative innovation among scholars worldwide.

Concurrently, its exploration of deep integration and development has garnered recognition within the industry. Its recent receipt of the China Publishing Government Award for Journals testifies to its professionalism and leadership.

I expect *Horticulture Research* to adhere to its ethos of excellence in publishing, and courageously champion disciplinary innovation. May it play a stronger role in agricultural modernization and the revitalization of the seed industry, contributing China's wisdom to human well- being and global ecological security.

—— *Yu Jingquan, academician of the Chinese Academy of Engineering, and professor at Zhejiang University*