

Key Tasks Set for 2022, Innovation and Cooperation Highlighted

By LI Linxu

Following the conclusion of the Two Sessions, work division on key tasks has been laid out for implementing 2022 Government Work Report, according to a circular released by the State Council on March 25.

To achieve this year's economic and social goals, the circular proposed a total of 52 major tasks in 44 aspects.

These tasks have been assigned to relevant ministries and departments in line with their function, with a clear-cut deadline.

The main targets set in the government work report include increasing GDP by around 5.5 percent, creating over 110 million new urban jobs, maintaining a CPI increase of around 3 percent, and achieving personal income rises basically in step with economic growth. Meanwhile, maintaining stability and improving quality in imports and exports, keeping grain output at more than 500 million metric tons, continuously improving ecological and environmental quality, and lowering the discharge of major pollutants are also among the main targets.

To fulfill these expected targets,



A bullet-proof UD cloth plant in a high-tech company in Hebei province. (PHOTO: XINHUA)

China will pursue prudent and effective macro policies, micro policies that can continuously energize market entities, and structural policies that facilitate smooth flows in the economy, noted the circular.

Moreover, sci-tech policies should be fully implemented, reform and opening up policies should lend impetus to development, and regional policies should ensure more balanced and coordinated development, stressed the docu-

ment.

It will further implement the innovation-driven development strategy and strengthen the foundation of the real economy.

To raise the country's capacity for sci-tech innovation, China will press ahead with the 10-year action plan on basic research to ensure stable support over the long term, and increase the share of basic research spending in the country's total R&D expenditures.

In 2021, China's spending on basic research rose 15.6 percent to 169.6 billion RMB. Its proportion to total R&D expenditure stood at 6.09 percent and is expected to increase to a record eight percent by the end of 2025.

The country will implement a three-year action plan for reforming the sci-tech management system, reinforce the country's strategic sci-tech capabilities, further develop national key laboratories, and leverage the strengths of universities, colleges, and research institutes.

It will also improve the approval procedures for major sci-tech projects and their management, and further reform the assessment and incentive systems for scientific research.

In the meantime, China will provide stronger incentives to promote innovation among enterprises, reinforce the principal position of enterprises in innovation, and strengthen intellectual property rights protection and application.

Engaging in international sci-tech cooperation, and stepping up efforts to build talent centers and innovation hubs of global importance are also highlighted in the circular.

Policy Watch

Good News for Sci-tech Workers

By CHEN Chunyou

Fostering an innovative and professional workforce is crucial for national sci-tech innovation, something China is keenly aware of.

The Sci-tech Workers' Day, on May 30 each year, was written into the revised *Law on Progress of Science and Technology*. Thus its importance was heightened. It reflects China's people-centered development philosophy, and greatly enhances the sense of pride within the circle of sci-tech workers.

In order to motivate researchers to climb up sci-tech peak, many policies that benefit researchers are put forward in this revised law. Article 68 says that China encourages sci-tech personnel to explore freely and take risks, and calls for a favorable atmosphere that inspires innovation and tolerates failure.

The researchers, engaged in pioneering and high-risk projects, would be exempted from liability if they fail to achieve decent results, but they have to prove they had tried their utmost and fulfilled responsibilities, notes article 68. This will greatly enlarge the room for researchers to explore all possibilities.

To free researchers from administrative work, and ensure sufficient time for their research, article 64 rules that the burden of sci-tech personnel in project application, document material submission, and expense reimbursement should be reduced.

For the sake of better stimulating the enthusiasm of researchers, a reward mechanism is highlighted in this revised law. For example, article 60 calls on research institutions, universities and enterprises to introduce incentive measures, such as dividends, option incentives and stock rights.

In terms of talent protection, the revised law introduces a protection and restraint mechanism. Article 57 stipulates that unfair treatment to sci-tech personnel and their research achievements is strictly prohibited. In addition, article 109 says people who use their power to oppress, exclude or deliberately harass sci-tech personnel would be punished.

Chen Baoming, vice director of Scientific and Technological Talent Center at the Ministry of Science and Technology (MOST), said that incentives and protection of rights and interests are two indispensable aspects for researchers.

Under the incentive mechanism, the more researchers contribute, the more they will benefit.

China fully respects the autonomy of research organizations, which may leave room for unfairness. Therefore, preventing researchers from being treated unfairly is not only to protect their rights and interests, but also a check and balance on the autonomy of the researchers' affiliated organizations, added Chen.

Previously, He Defang, deputy secretary-general at MOST, said that China still faces a shortage of strategic scientists, and the measures to train and use young researchers are still not adequate. In the revised law, the growth of young researchers is acknowledged. Article 66 stipulates that the identification, cultivation and utilization of young talent should act as indicators for assessing the sci-tech progress of research organizations.

According to the *China Science and Technology Talent Development Report 2020*, released in 2021, during the 13th Five-Year Plan period (2016-2020), more young people have become the major workforce in research.

In terms of stimulating the creativity of researchers, the classified evaluation system for researchers was emphasized. Article 63 says that China should implement a classified evaluation system based on the differences of research disciplines and the contribution of researchers.

In fact, China has always focused on the reform of the talent evaluation mechanism. According to MOST in late March, some research associations in the fields of math, physics, chemistry, computer science and medicine were chosen as pilot units in 2021. Over the past year, they all have established their own *Guidelines on Academic Evaluation Standards and Guidelines on the Code of Conduct for Research Activities*, and achieved preliminary results.

For example, Chinese Physical Society said that physical academic evaluation should not solely focus on the author's ranking. It is required to make a comprehensive and objective evaluation based on the novelty, academic influence, opinions of peer experts, quality of the publications or the patents, and quotation rate, while considering the different characteristics of theoretical research, experimental research, basic research and applied research.

Green Hydrogen Powers China's Energy Future

By ZHONG Jianli

At the recently concluded Beijing 2022 Winter Olympics and Paralympics, hydrogen energy was used in various fields, such as fueling the torches and vehicles, demonstrating the wider application of the green, low-carbon energy.

China plans to further promote the construction of hydrogen energy infrastructure and expand its applications. By 2025, the hydrogen produced from renewable energy sources should become an essential part of the energy structure, according to the *Medium and Long-Term*

Plan for the Development of Hydrogen Energy Industry (2021-2035), recently issued by the National Development and Reform Commission and the National Energy Administration (NEA).

Green hydrogen vs. grey hydrogen

The plan's goal is that by 2025, the hydrogen produced from renewable energy sources should reach 100,000 to 200,000 tons per year, helping to reduce the carbon dioxide emission of one to two million tons per year.

According to statistics of China Hydrogen Industry Alliance and China National Petroleum & Chemical Planning

Institute, China's hydrogen production capacity is about 40 million tons per year, and the output is about 33 million tons per year. However, most of the hydrogen is produced from fossil fuels or industrial by-products, which is regarded as grey hydrogen. Specifically, nearly 80 percent of hydrogen is produced from coal or natural gas, while that produced from renewable energy, or green hydrogen, is even less.

"The country will encourage the development of hydrogen produced from renewable energy in areas rich in wind, solar and hydro power," said Liu Yafang, deputy director of the science and technology department of NEA, adding that the proportion of green hydrogen will continue to increase in the future.

Diversified applications

Currently, most of the hydrogen energy is used in transportation, and progress of using the energy in other fields has been slow.

The plan proposes to steadily promote diversified demonstration applications of hydrogen energy, by using it in energy storage, distributed power generation, and industries.

For example, given that hydrogen energy can be stored in large capacity

for a long period, a new integrated application model of "wind-solar-hydro-power plus hydrogen energy storage" can be explored and developed.

Technological breakthroughs

The hydrogen energy industry chain is longer and related technologies are more difficult. Compared with the international level, China still has room for improvement in terms of key basic materials, core components, scientific mechanisms of hydrogen safety, and hydrogen professionals.

Thus, the plan calls for strengthening basic research, key and disruptive technologies innovation, building a professional team, and establishing multi-level and diversified innovation platforms to form a more collaborative and efficient innovation system, so as to improve the competitiveness of the hydrogen energy industry.

The plan also encourages the international joint R&D of hydrogen energy science and technology, participation in international hydrogen energy standardization activities, and cooperation with the Belt and Road Initiative countries in carrying out hydrogen energy trade, infrastructure construction, and product development.

It can complete the detection of the fineness, length, and net cashmere rate of the hair in 10 seconds, which previously took 3-5 days. The finer cashmere extracted by the machine can be processed into high-end textile products with higher value.

At present, Xinjiang has established a circular economy industrial chain and a digitalized supervision system, which can trace the whole process of animal breeding, epidemic prevention, product processing, and marketing, laying a solid foundation for sustainable development of livestock farming in the region.



A hydrogen-powered bus in Qingdao, east China's Shandong province. (PHOTO: VCG)

Xinjiang Livestock Get New Tech Injection

By Staff Reporters

As a local custom, seven million heads of livestock in the Xinjiang Uygur Autonomous Region have recently begun their annual migration to spring pastures.

Now, to assist with development, the traditional animal husbandry industry in Xinjiang is seeking the help of science and technology.

Leveraging the Internet of Things,

cloud computing, and other technologies, the Tianlai Beef Cattle Breeding Base in Xinjiang has set up an intelligent breeding management system, where the number of prime beef cattle increases by 20-30 percent each year.

Technology not only makes the livestock farming industry more efficient, but also extends its industrial chain.

One example is in Altay, where the locally developed physical sterilization

method of biofilter helps keep camel milk fresh. With this method, the active nutrients in camel milk are retained, and the shelf life of camel milk is extended from less than seven days to six months. The per capita income of farmers is increased by more than 6,000 RMB each year.

The animal hair rapid detector is another area that has been developed and promoted by Xinjiang Academy of Animal Sciences.

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"It used to take at least one day to get to the county's hospital, but now we can receive equal treatment at the township health center," said Wu Yuanming, director of the Jiuzhuang township health center in the mountainous Guizhou.

At present, telemedicine services have covered all public medical institutions in Guizhou, and more than 2.4 million diagnoses have been made

through telemedicine since June 2016, said the Guizhou Provincial Health Commission.

The Xi'an district of Mudanjiang city, Heilongjiang province, has built a "smart brain" system to provide farmers with information services on agricultural technology, financial services and product transactions. Meanwhile, the full coverage of monitoring equipment has also supported accurate pandemic prevention.

Digital Villages: New Way to Common Prosperity

Refinement of rural governance

Managing rural refuse and natural disasters is another benefit of digital technologies, which have been applied to promote the rule of law in rural areas, improve rural governance, and enhance self-governance by villagers.

According to data from the Minis-

try of Agriculture and Rural Affairs (MOA), information management and service platforms were established in 78 percent of the counties, and 77 percent of administrative villages were equipped with video monitoring systems, which can provide a cleaner and safer environment for villagers.

On the App, Guizhou Digital Village, you can see the operation of more than 120,000 garbage collection points and nearly 6,000 garbage collection vehicles, covering more than 110,000 villages in Guizhou.

By establishing the smart water conservation system, Guizhou's Xifeng county realized the real-time monitoring of 32 reservoirs and seven rivers to give early alert for floods.

Enterprises are joining in the pro-

cess. The MOA has signed agreements with enterprises to promote the application of digital platforms and improve rural governance.

Cooperating with the Alibaba Group, Jiaoling county, Guangdong province, has developed a precise governance App based on "credits," which reflect the performance of both governments and villagers, therefore gradually standardizing complex or trivial affairs.



Researchers carry out experiments at the Yazhou Bay Seed Laboratory in Hainan province. (PHOTO: VCG)