Active Role Needed by U.S. in SDGs

Opinion

By LI Zhe & TIAN Nianping

The CHIPS and Science Act, passed in August, seems to support U.S. domestic chip industry and scientific research. But in reality, it aims to politicize and marginalize the development issues, and to artificially create divisions and confrontations by setting restrictions on China's technology, investment and personnel communication, etc.

The act not only undermines sci-tech innovation cooperation between the two countries, but also impedes global economic recovery and sustainable development.

In the past decades, China and the U.S. have deepened their international cooperation in various fields such as scientific research, industry, investment and education, and established extensive relations.

Supporting economic development and people's well-being, the cooperation has driven globalization and the sustainable development goals (SDGs), which is in line with aspirations of the people worldwide for peace, development and cooperation.

Currently, sustainable development is facing historic challenges that can only be solved by sci-tech innovation cooperation.

Amina Mohammed, deputy secretary-general of the United Nations, speaks at the UN High-level Political Forum on Sustainable Development. (PHOTO: XINHUA)

On one hand, there is a structural imbalance between global supply and demand, which includes imbalances between different countries and regions, as well as imbalances between different stages of development.

China and the U.S. play the most important roles in global technology and industrial gradient transfer. That means, if the cooperation falls, it will further reduce the efficiency of the global economy and hinder its recovery.

On the other hand, the various sustainable development problems facing the world today can be traced back to the development gap and development deficit.

Facing a huge financing gap, there is a long way to achieve and implement the *United Nation's 2030 Agenda for Sustainable Development*. Issues such as cyber security, energy security, food security, climate change, and infectious diseases can only be solved through sci-tech innovation cooperation under a multilateral framework.

Take the chips act as an example, the U.S. has taken the initiative to carry on a series of actions in recent years to undermine China-U.S. technological innovation cooperation and exchanges.

These actions not only add additional costs to the global innovation system, but also disrupt the fundamental paradigms in science, and reduce other countries' voice on issues such as research integrity, ethical issues raised by new technologies, and sustainability of ecological environment.

Moreover, in the face of global problems, China and the U.S. are both major suppliers of capital, technology and infrastructure. The destruction of bilateral cooperation will inevitably have a very negative impact on various multilateral cooperation mechanisms.

As the developed country with the largest economy in the world, the U.S. has a huge impact on global sustainable development. Thus, the U.S. government should be fully aware of its responsibilities, and abandon the deglobalized cold war mentality and zero-sum thinking.

Only by actively carrying out different forms of sci-tech innovation cooperation with emerging markets and developing countries including China, can the U.S. solve its own problems and play an active role in the global development pattern of win-win cooperation and shared prosperity.

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Comment

U.S. Sci-tech Hegemony Will Not Succeed

Edited by GONG Qian

U.S. chipmaker NVIDIA said it received a notice from the U.S. government on August 26, informing the company that it needs a new license to export certain graphics processing units (GPUs) used in AI to China and Russia.

The new license equates to an export ban, which directly affects the NVIDIA's A100 and forthcoming H100 integrated circuits.

According to Reuters, another chip manufacturer, Advanced Micro Devices (AMD), said the U.S. government also ordered it to stop exporting its MI250 AI chips to China.

These are new technological restrictions imposed by the U.S. on China. However, the brunt of the impact will be felt by the two companies and the U.S. itself.

China is the second largest market for both NVIDIA and AMD, making up 26.42 percent and 24.92 percent of their global revenues respectively, according to their most recent annual financial reports.

The two companies are therefore trapped by their own government. Shares of AMD and NVIDIA fell 3.7 percent and 6.6 percent respectively hours after the export bans, according to Reuters.

But it seems that NVIDIA will suffer even further. NVIDIA's stock price plummeted, with its shares finishing the week down almost 15 percent, said Fox Business.

The restrictions may impact the company's ability to complete its development of H100 in a timely manner, NVIDIA said in the Securities and Exchange Commission (SEC) filing.

So it is foreseeable that the U.S. ban will negatively impact the company. NVIDIA revealed that it may lose, "Approximately 400 million USD in potential sales to China." This represents 6.8 percent of the company's expected revenue in the third fiscal quarter, "A sizable percentage of NVIDIA's overall business," *Forbes* magazine reported.

Again, the U.S. is trying to limit China's access to technology using so-called concern over national security as an excuse.

"This is the new Cold War reality and broader export restrictions are part and parcel of this," Amir Anvarzadeh of Asymmetric Advisors told Bloomberg. "The export restrictions will broaden and it will impact semiconductors, AI, autonomous systems and biotech," he said.

"What the U.S. has done is typical sci-tech hegemony," said China's Foreign Ministry Spokesperson Wang Wenbin at a regular press conference on September 1. "The U.S. seeks to use its technological prowess as an advantage to hobble and suppress the development of emerging markets and developing countries," he said.

Opportunities and challenges often go hand in hand. Washington's move may hinder the development of China's high-end chips, but it "will accelerate the development of local datacenter GPUs such as Alibaba's" and it will boost sentiment for domestic stocks in the sector, Jeff Pu of Haitong International Securities told Bloomberg.

Bloomberg also reported that the stock shares of China's Cambricon Technologies Corp. jumped more than 30 percent over two days after U.S. export restrictions were announced. Cambricon is to a homegrown alternative to NVIDIA or AMD for AI chipmaking.

China, meanwhile, has been making every effort in tech innovation to produce more alternatives, thus realizing its self-dependence. That the U.S. perpetuates its hegemony in the sci-tech sector will not succeed, said Wang Wenbin.

Voice of the World

Global Energy Supply Needs Chinese Solar Industry

Edited by QI Liming

Renewable energy sources such as solar panels and wind turbines will dominate the energy supply in the future, putting the world technologically and economically in a position to be rid of fossil fuels entirely by 2050, according to a July 25 paper published by the Institute of Electrical and Electronics Engineers (IEEE) in New York.

Solar-powered street lights "illuminate" the beautiful countryside in Huai'an, Jiangsu province. (PHOTO: VCG)

According to the United Nations, over 160 companies with a combined 70 trillion USD in assets are committed to decarbonizing the global economy, which means phasing out fossil fuels by 2050, said Sven Teske, associate professor at the University of Technology, Sydney and one of the authors of the report. "Our research has shown that we have the technology to implement a global energy supply based entirely on renewable energy," said Teske.

Solar power is enjoying trail winds. The sector is on track to produce 33 percent of the world's electricity by mid-century, according to International Energy Agency (IEA), putting it second behind wind power's 35 percent.

According to IEA's newly released report, the global manufacturing capacity for solar panels has increasingly moved out of Europe, Japan and the U.S. over the last decade and into China, which has taken the lead in investment and innovation.

China's share in all the key manufacturing stages of solar panels exceeds 80 percent today. "China has been instrumental in bringing down costs worldwide for solar PVs, with multiple benefits for clean energy transitions," said IEA Executive Director Fatih Birol.

According to *Nikkei Asia*, solar cell manufacturing is driven by capacity. As bigger production volumes drive down the cost per unit, all players pursue economies of scale, and the global decarbonization push sets the stage for aggressive investments.

Chinese solar panel manufacturers are planning or building new production facilities that will add a combined annual output capacity equivalent to 340 nuclear reactors, with strong global demand and new mass-production technology.

According to *The Wall Street Journal*, rooftop solar, in particular, could become a financially attractive option for many homeowners given skyrocketing electricity prices. Global financial services group Nomura expects global solar installations to grow nearly 50 percent both this and next year.

Many of those installations will be in China. The country built a record amount of solar power capacity in 2021, and it will likely break that record again this year. China added 31 GW in the first half of this year, more than double the new capacity installed during the same period last year.

The Wall Street Journal also pointed out that skyrocketing demand for non-fossil-fuel energy sources worldwide means a bonanza for China's solar industry. The fair winds blowing for Chinese manufacturers looks set to continue for some time to come.

Small Inspection Robot Wriggles Through Pipelines

Hi! Tech

By Staff Reporters

In complex machinery like aircraft engines and oil refinery systems, pipeline inspection is an essential task for ensuring safety.

To this end, a research team from Tsinghua University has developed a type of smart material-driven pipeline inspection robot (weight 2.2 grams, length 47 millimeters, diameter <1 centimeter) that fits into pipes with sub-centimeter diameters and different curvatures.

Inspired by the principle of an earthworm wriggling, the researchers adopted high-power density, long-life dielectric elastomer actuators as artificial muscles and smart composite microstructure-based, high-efficiency anchoring units as transmissions.

Fast assembling of components using magnets with an adjustable number of units, were used to fit varying pipeline geometries. The research team analyzed the dynamic characteristics of the robots by considering soft material's unique properties, like viscoelasticity and dynamic vibrations and tuned the activation voltage's frequency and phase accordingly.

Powered by tethered cables from outside the pipe, the peristaltic pipeline robot achieved rapid motions horizontally and vertically (horizontal: 1.19 body lengths per second, vertical: 1.08 body lengths per second) in a subcentimeter-sized pipe (diameter is 9.8 millimeters).

In addition, the robot has capacity to move in pipes with varying geometries (diameter-changing pipe, L-shaped pipe, S-shaped pipe, or spiral-shaped pipe), filled media (air or oil) and materials (glass, metal, or carbon fiber), and it successfully finished an inspection task at various speeds.

Worm-inspired robot for centimeter-scale pipeline inspection. (PHOTO: SCREENSHOT)

China's Manufacturing Remains Vibrant

Edited by TANG Zhexiao

Since carrying out the policy of reform and opening up, China has seized its opportunity with both hands, racing to emerge as the world's biggest manufacturer.

From "Made in China" to "Intelligent Manufacturing in China," the country has shown its resilience and vitality, during the global supply chain crisis, providing support to stabilize the industrial chain and contributing to the high-quality development of global manufacturing.

Irreplaceable world factory

Since 2015, China's five major projects including innovation centers, industrial bases, green manufacturing and intelligent manufacturing, have all been launched and achieved results.

India's online news website Mint recently published an article, saying, "Other countries want to cut their dependence on the world's biggest factory floor, [and are] wary that Beijing is wielding too much power over the global economy. Replacing China, though, isn't all that easy. "

Parts of the supply chain may shift away from China, but for now, "No country can come close to building the intricate network of factories across such a broad range of sectors," said Mint.

U.S. bimonthly magazine *The National Interest* holds the same view. Ever since the beginning of the pandemic, many in the West have discussed the need for supply chain diversification to decrease their dependence on China for manufactured goods. But unfortunately, China is unlikely to be replaced in the global manufacturing supply chain anytime soon.

In fact, China has cemented its position as the world's leading supplier over the past two years. *The Wall Street Journal* said, "The West relies on Chinese factories, despite national security, supply-chain concerns."

China's share of global electronics exports, for instance, increased to 42 percent in 2021 from 38 percent in 2019, while its share of textile exports rose to 34 percent from 32 percent, according to data from the United Nations Conference on Trade and Development.

Intelligence boosts manufacturing upgrade

The magazine *European Tool & Mould Making* said, "Smartly Made in China" is making progress and some regions have already become real hot spots.

A recent report by global management consulting firm McKinsey, also said that China's industrial and manufacturing sectors will be able to drive a new wave of growth in the country's cloud computing market.

After surveying 278 decision makers in enterprise IT, digital and cloud from a wide range of sectors, analysts at McKinsey expect China's public cloud market to triple in size in the next few years, from 32 billion USD in 2021 to 90 billion USD by 2025, as industrial and manufacturing companies shift their information technology workloads to the cloud.

Green manufacturing in China has flourished as well. According to an article reporting on the world state of hydrogen technology patents by Japanese newspaper *Nikkei Asia*, the number of hydrogen technology patent filings by Chinese companies over this decade is already more than 10 times that of filings in the previous decade.

Scoring higher than Japan in four of the five categories of manufacturing, storage, safety controls and transportation, China has a good chance eventually to overtake Japan in all hydrogen-related fields, the article said.

China's manufacturing remains formidable despite the changes brought about by the pandemic, said *Barrons*, an American weekly magazine published by Dow Jones & Company, adding that "If global manufacturing were akin to the Olympics, China would take gold or silver in every event."