CNA

Issue 9 | April 2024

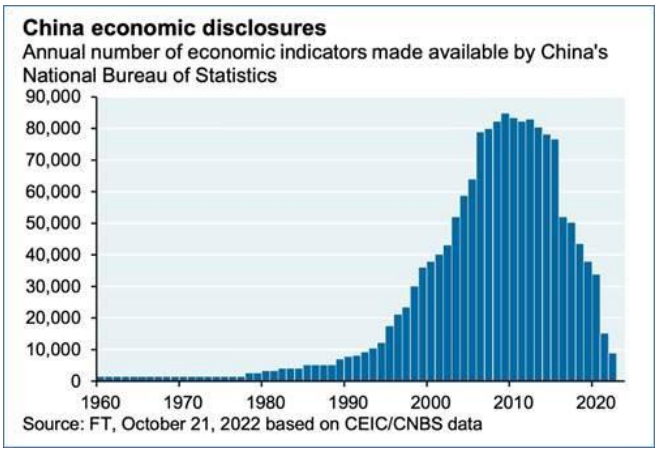
Intersections is a news digest that describes the interplay between the People's Republic of China's (PRC's) technology acquisition efforts and US and partner nation responses to those efforts.[1] In this issue, we discuss China's economic and innovation goals emerging from a major annual meeting held in Beijing in March. We also discuss semiconductor politics in the US and abroad, PRC hacking threats, subsea cable concerns, and the PRC's shipbuilding capacity compared to that of the US and its partners. Regarding microchip updates, as both the US and PRC face hurdles in developing their respective semiconductor industries, other countries are capitalizing on opportunities to move up the value chain. In terms of shipbuilding, the US Secretary of the Navy has encouraged partners like Japan and South Korea to increase investment in this vital industry. Please click here to read *Intersections* in your browser.

THIS ISSUE'S CONTENTS

PRC ECONOMIC, INNOVATION, & LEGAL UPDATES

The recent convening of China's national legislature and top advisory body offers few new insights into PRC economic policy and reinforces focus on innovation. The National People's Congress and the Chinese People's Political Consultative Conference, collectively referred to as the "Two Sessions," provide PRC government and Party leaders an opportunity to review progress from the previous year and announce budgetary, legal, and regulatory changes for the next year. For analyzing PRC economic statecraft, the Two Sessions provides updates on the direction of foreign and domestic policy, offering clues about how PRC officials will attempt to achieve their national strategic goals. The official PRC government work report, approved on March 11, reiterates goals announced in previous Party and government documents, including a focus on "greater self-reliance and strength in science and technology" (S&T), which is part of the PRC's "innovation-driven development strategy."[2] In terms of "major tasks" for 2024, the work report states that the PRC must "enhance the resilience and competitiveness of industrial and supply chains" and that doing so will require the government to actively support strategic emerging industries.[3]

Figure 1. Declining access to economic data



Yet achieving China's innovation and self-reliance goals will not be easy given China's current economic challenges. The PRC government work report notes unemployment, local debt, the property market, an aging population, and "funding shortages" for major projects as problems that could inhibit the PRC's goals.[4] International media outlets have called China's economic growth targets for this year "ambitious," with the PRC government work report calling for 5 percent gross domestic product (GDP) growth in 2024,[5] which is essentially the same goal as the 2023 level of 5.2 percent.[6] For foreign observers attempting to assess China's ability to achieve its S&T and innovation goals, understanding the domestic Chinese economy will prove increasingly difficult as public access to PRC economic data continues to decline. (Figure 1 summarizes the decline in publicly available economic indicators over the past decade, according to PRC government data compiled by the *Financial Times*.)[7]

Two Sessions approves the PRC *Law on Guarding State Secrets,* adding further complexity for foreign businesses and individuals operating in China. The PRC *Law on Guarding State Secrets* was approved in March; it outlines specific types of information that will now "be designated as state secrets."[8] The law outlines controls for "state secrets" in the following categories: (1) decision-making on PRC affairs, (2) national defense construction and armed forces activities, (3) diplomacy and foreign affairs, (4) national economic and social development, (5) S&T, (6) national security and criminal investigation, and (7) "other secret matters as designated."[9] Combined with other laws, such as the Counterespionage Law, data or information on these topics could be considered a state secret. Foreign businesses or individuals with access to this information could run afoul of the law given definitions that remain vague. Unauthorized acquisition,

sharing, or mishandling of state secrets could be considered espionage—in 2023, for example, a Japanese pharmaceutical executive was arrested under China's *Counterespionage Law*,[10] prompting concerns from Japanese businesses about operating in the PRC.[11]

SEMICONDUCTOR UPDATES

In early 2024, the US, PRC, and key US allies and partners continued to implement policies to strengthen their domestic microchip industries. Recent developments include challenges facing the US in its promotion of domestic chip manufacturing; PRC progress in advanced chip development; and increasing roles for both well-established and emerging Indo-Pacific countries in microchip production.

US encounters obstacles in expansion of domestic chip manufacturing. According to a *New York Times* report, several projects to construct new semiconductor fabrication ("fab") facilities in the US are running behind schedule.[12] These delays are the result of multiple factors, including the following:

- Companies' increasing uncertainty regarding the projected future market demand for chips that are made in the US, leading them to slow the pace of new fab projects to allow more time to assess market conditions
- Protracted negotiations between the US government and companies over which investments will qualify for tax incentives created under the 2022 CHIPS Act, with some companies waiting on the US Treasury Department to issue official guidance
- Shortages of skilled labor to install highly specialized manufacturing equipment at new fabs, notably at Taiwan Semiconductor Manufacturing Company's (TSMC's) project site to build two new fabs in Arizona.[13]

On March 19, *Nikkei Asia* reported that, as a result of higher-than-expected building costs and labor shortages, five TSMC suppliers that had planned to build facilities near the Arizona fab sites to supply chemicals and other inputs used in chip production were postponing construction.[14] As a result of these delays, some industry observers have expressed concerns that if the US fails to get the new fabs funded and under construction quickly, investment capital for new facilities will shift to Asia.[15]

Allies weigh US requests to further restrict chip technology exports to China. In March 2024, the *Financial Times* and *Nikkei Asia* reported that the US is pushing major chipmaking equipment exporters—including Japan, the Netherlands, and South Korea—to further limit their exports of chipmaking materials and components to China.[16] In January 2023, the US persuaded Japan and the Netherlands to restrict high-end chipmaking exports (Issue 3) to the PRC following the US's own unilateral imposition of chip export controls in October 2022 (Issue 1). Since then, however, Japan and South Korea have sold record amounts of slightly older-generation chipmaking equipment and materials to the PRC that are not restricted under the US-Japan-Netherlands export regime. South Korea's role is particularly pivotal as PRC companies are reportedly using slightly less-advanced South Korean equipment to produce leading-edge chips.

In response to US concerns, allies are expressing reluctance or are outright declining to join Washington's most recent push to broaden the export restrictions. For example:

- Japanese officials were surprised by the request, according to *Nikkei Asia*. In March, Japan's Minister of Economy, Trade, and Industry said Japan has "no plans to take new measures at this time."[17]

- The Netherlands is attempting to coordinate any future export controls at the European Union (EU) level, reportedly to "avoid fragmentation of national controls within the EU," according to a source in The Hague.[18]
- A source close to the South Korean government indicated that it would likely be "reluctant" to introduce the curbs because the medium-sized companies selling this equipment to China "are regarded as the backbone of the Korean economy."[19]

PRC reportedly making progress in next-generation chip production. The *Financial Times* reports that PRC firms such as Semiconductor Manufacturing International Corporation (SMIC) and Huawei are making incremental advances in semiconductor technology despite US restrictions designed to curb related development.[20] The PRC Party-state considers integrated circuits a core technology that faces "bottlenecks,"[21] in part because of US export controls on the most advanced chips.[22] SMIC is building new facilities in Shanghai to produce chips designed by Huawei and plans to create the chips using existing equipment imported from the US and the Netherlands before the US-Japan-Netherlands joint export restrictions went into effect last year. SMIC and Huawei claim they will be able to use the equipment to produce chips at the 5nm node size—an advancement compared to Huawei's existing 7nm chip.

SMIC's use of older machines to create advanced chips has not been efficient, however. According to the *Financial Times* report, the cost performance of SMIC's products is significantly lower than that of Taiwan's TSMC: SMIC is reportedly charging 40 to 50 percent more for its products even as the company's production lines are yielding defect-free chips at a rate less than one-third of TSMC's. Despite this inefficient production, one expert on China's semiconductor industry asserted that Huawei and SMIC might just be attempting to prove to the PRC government that they could make 5nm chips at all.[23] If the PRC ultimately succeeds in making leading-edge chips, it may be able to obtain a global market share sufficient to undermine the effectiveness of US export restrictions.[24]

Malaysia and Japan grow their domestic semiconductor industries. As the US and PRC face hurdles in developing their respective semiconductor industries, other countries, notably Malaysia and Japan, are capitalizing on opportunities to move up the chip manufacturing value-added chain.

Malaysia. The *Financial Times* reported in March that the US, PRC, Japan, South Korea, and other countries have stepped up investments in Malaysia's Penang region to develop new facilities for the assembly, packaging, and testing of advanced chips.[25] Malaysia has decades of experience in this area and holds 13 percent of the global market for chip assembly, packaging, and testing. Per the report, the country's leaders hope to use the influx of investments to increase the competitiveness of Malaysia's chip industry through participation in higher-value activities, including wafer fabrication and integrated circuit design.

Japan. In February, Taiwan's TSMC inaugurated its first semiconductor facility in Kumamoto, southwestern Japan, and has plans to pursue a second facility in Kumamoto with the help of an estimated $4.86 billion in subsidies from the Japanese government.[26] Once the dominant global semiconductor manufacturer in the 1980s, Japan has been seeking to regain ground lost to Taiwan, South Korea, and the US over the past three decades by attracting foreign investment from these countries to set up chipmaking facilities on its soil.[27] One advantage Japan has over other countries is that it remains a major global supplier of chipmaking machinery and inputs, which can serve as a foundation for its efforts to revive chip manufacturing.

CRITICAL INFRASTRUCTURE THREATS

Public discussion of threats to critical infrastructure has increased In 2024, particularly in the maritime domain. In the US, many of those threats originate from PRC hackers and PRC-manufactured equipment. In other parts of the world, there is increasing concern about the security of subsea cable infrastructure that enables global connectivity. We describe below several recent concerns related to critical infrastructure.

CYBER THREATS

Federal Bureau of Investigation (FBI) director highlights PRC hacking threat to US critical infrastructure. On January 31, the House Select Committee on Strategic Competition between the US and the Chinese Communist Party (CCP) held a hearing titled "The CCP Cyber Threat to the American Homeland and National Security."[28] In his opening statement, FBI Director Christopher Wray warned of the scope and magnitude of PRC hacking operations against the US.[29] He said that, aside from everyday theft of personal and corporate data, China's hackers are targeting US critical infrastructure, including water treatment plants, electrical grids, oil and gas pipelines, and transportation systems.

In his statement, Wray also highlighted a recent instance of the FBI—in partnership with the private sector, allies abroad, and all levels of US government—countering a PRC cyber threat to US critical infrastructure. On January 31, the FBI announced an operation that identified hundreds of US-based small office/home office routers hijacked by the PRC state-sponsored hacking group Volt Typhoon.[30] According to Wray, malware installed on these routers enabled China to mask "pre-operational reconnaissance and network exploitation" efforts against US critical infrastructure.

US Department of Transportation (DOT) identifies three PRC companies posing risks to US port infrastructure. On February 21, the DOT issued an advisory to alert maritime stakeholders of potential vulnerabilities to maritime port equipment, networks, operating systems, software, and infrastructure.[31] The advisory named three PRC companies as posing risks to the technology systems of maritime infrastructure:

- **LOGINK** is a single-window logistics management platform that was developed by the PRC Ministry of Transport. At least 24 global ports have cooperation agreements with LOGINK. Its installation and utilization in critical port infrastructure likely provides the PRC access to or the ability to collect sensitive logistics data.
- **Nuctech Company, Ltd.** is a PRC state-controlled entity that manufactures security inspection equipment deployed at key logistic nodes worldwide. This equipment includes biometric information, personally identifiable information, patterns of life cargo information, proprietary data, and geo-locational metadata. Nuctech was added to the Department of Commerce's Entity List in December 2020 for its involvement in activities contrary to US national security interests.[32]
- **Shanghai Zhenhua Heavy Industries Company Limited (ZPMC)** maintains the largest share of the global ship-to-shore (STS) crane market. Depending on their individual configurations, these cranes may be controlled, serviced, and programmed from remote locations, leaving them potentially vulnerable to exploitation. (For more on ZPMC, see the next section.)

White House launches initiative to protect US ports from cyber threats. On February 21, the Biden-Harris Administration announced a new initiative to improve the cybersecurity of US port infrastructure.[33] Actions taken on the same day in support of the initiative included the following:

- **Greater Department of Homeland Security (DHS) authorities.** President Biden issued an Executive Order to bolster DHS's authority to address maritime cyber threats directly. It instituted mandatory reporting of cyber incidents or active cyber threats endangering any vessel, harbor, port, or waterfront facility. It also granted the US Coast Guard the authority to control and inspect vessels and infrastructure that present a known or suspected threat to US maritime infrastructure.
- **Mitigation of cyber risks posed by PRC-produced cranes.** The US Coast Guard issued a Maritime Security Directive on cyber risk management actions for PRC-manufactured STS cranes located at US Commercial Strategic Seaports. Owners and operators of such cranes are to acknowledge the directive and take a series of actions on their associated information technology and operational technology systems.
- **Domestic production of port cranes.** The administration announced plans to invest over $20 billion over the next five years into rebuilding US industrial capacity to produce port cranes with trusted partners. As a result, Paceco Group—a US subsidiary of the Japanese company Mitsui—is planning to onshore US manufacturing capacity for crane production.

The launch of the new port security initiative came amid an ongoing investigation by the House Committee on Homeland Security and the Select Committee on Strategic Competition between the United States and the CCP on cybersecurity risks, foreign intelligence threats, and supply chain vulnerabilities tied to PRC maritime equipment and technology. On February 29, the committees sent a letter to ZPMC headquarters and its US subsidiary outlining concerns about possible cyber espionage by ZPMC-produced STS cranes operating at US ports.[34] The committees requested clarification from ZPMC on matters pertaining to their investigation, including an explanation of why ZPMC installed on US-bound STS cranes cellular modems and other components that did not contribute to the cranes' operations. On March 10, ZPMC issued a press release stating that its cranes pose "no cybersecurity risk to any port" and that the company has always operated in compliance with relevant countries' laws and regulatory requirements.[35]

SUBSEA CABLE CONCERNS

Subsea cable redundancy and resilience concerns grow amid US-China digital competition. Recent damage to subsea cables in the Red Sea[36] and internet outages in Africa highlight concerns about digital resilience. In mid-March, four fiber optic cables failed, resulting in outages in Nigeria, Cote d'Ivoire, Liberia, Ghana, Burkina Faso, and South Africa.[37] Parts of Africa are more susceptible to internet outages because they lack cable redundancy, which is more robust in North America and Europe.[38]

Approximately 99 percent of internet traffic flows via subsea telecommunications cables, and both China and the US have been investing heavily in expanding those networks. China's Digital Silk Road is a major PRC economic initiative first announced in 2015 that aims to increase the PRC's central role in global telecom networks. The PRC government work report, approved in March following the Two Sessions (discussed above), reiterated the importance of the digital economy to Beijing's innovation and foreign policy goals.[39] The Digital Silk Road includes subsea cable projects, and building and operating fiber optic cables is part of Beijing's efforts to expand "international communications connectivity" along the Belt and Road.[40]

The US government has expressed concerns about China's Digital Silk Road efforts, and telecom firms affiliated with China, such as Huawei, China Mobile, China Unicom, and China Telecoms Corporation, are on the US Entity List.[41] To increase redundancy in subsea cable networks and avoid concerns about PRC surveillance, the US government has been supporting subsea cable projects for its allies and partners. For

example, Australia, Japan, and the US offered to fund the East Micronesia Cable after concerns about Huawei Marine's potential involvement in an earlier phase of the project.[42] In January 2024, the US State Department announced that a new subsea cable will become the first connection between South America and the Indo-Pacific; the Humboldt cable will connect Chile to Australia via French Polynesia and is scheduled for completion in 2026.[43] Between 2016–2022, Google, Meta, Amazon, and other US technology companies allocated about $2 billion to fund subsea cables, representing 15 percent of the global total.[44]

ALLY AND PARTNER DEVELOPMENTS

US Navy looks to Japan, South Korea to boost US shipbuilding capacity. During a February visit to the Indo-Pacific, US Secretary of the Navy Carlos Del Toro met with the CEOs of leading South Korean and Japanese shipbuilding companies and encouraged them to invest in former US shipyard sites throughout the country.[45] The shipyards are still "largely intact," making them "ripe for redevelopment."[46] In Del Toro's view, partnering with companies like Hyundai, Hanwha, and Mitsubishi will allow the US to draw on their industrial expertise, thereby re-energizing US efforts to build advanced military and civilian vessels.[47]

According to *Nikkei Asia,* Del Toro's efforts reflect US concerns over the growth of the PRC's shipbuilding industry and the People's Liberation Army Navy (PLAN).[48] The PRC has the largest shipbuilding industry in the world. According to the *Financial Times*, China built 1,000 ocean-going vessels in 2023, while the US produced only 10.[49] With the support of China's shipbuilding industry, the PLAN has been able to rapidly expand its fleet. As *Nikkei Asia* reported, the PLAN currently possesses a battle force of around 370 ships and submarines and is expected to increase that number to 400 by 2025. In contrast, *Nikkei* notes, the US Navy's battle force consists of fewer than 300 ships and submarines.[50]

The PRC has been able to achieve its dominant position in global shipbuilding because of its long-term investments guided by national economic and industrial policies.[51] Since the early 2000s, the PRC has designated shipbuilding a strategic industry and provided it with preferential loans, tax breaks, and other forms of financial and policy support, such as providing access to steel at below-market prices. The PRC has also sought to maintain control of the industry through its state-owned enterprises.[52]

US and Indonesia to expand cooperation in critical mineral supply chains. In November 2023, President Biden and Indonesian President Joko Widodo committed to the development of a critical minerals action plan to reduce supply chain dependencies and vulnerabilities, promote supply chain transparency, and expand access to secure and sustainable critical minerals sources. The two heads of state said they would pursue these efforts while laying a foundation for future negotiations on a critical minerals agreement.[53]

The two countries' cooperation in this area comes as industrialized countries worldwide seek to secure access to critical minerals and reduce their dependence on sourcing such minerals from China. Indonesia's efforts in this space include the country's 2020 ban on nickel ore exports, a measure intended to strengthen its domestic critical mineral processing capacity[54] and thereby bolster Indonesian companies' position in the electric vehicle (EV) supply chain for critical mineral-intensive components such as EV batteries.[55]

Japan considers selling naval ship antennas to India. On March 10, *Nikkei Asia* reported that the Japanese government is considering exporting an unspecified quantity of Nora-50 "UNICORN" naval ship communication antennas to India.[56] These antennas employ a stealth design and are used on Japanese Maritime Self-Defense Force ships to detect the movement of missiles and drones. The potential sale is significant for two reasons. First, should it go through, it will be only the second time Japan has exported

fully assembled defense equipment since the government's lifting of a ban on such exports in 2014.[57] Second, India's acquisition of UNICORN antennas could contribute to New Delhi's efforts to curb its defense equipment reliance on Russia, which has supplied as much as 65 percent of India's weapons purchases over the past two decades.[58] Since the outbreak of the war in Ukraine, however, India has taken steps to diversify its arms procurements, including the striking of new agreements with the US, France, and Israel.[59]

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This work was created in the performance of Federal Government Contract No. N00014-22-D-7001.

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