PSSI PERSPECTIVES — 8

CHINA DEPLOYS BEIDOU TO PROJECT POWER AND INFLUENCE

Dr. Jana Robinson, Patrik Martínek, Jakub Pražák and Kristína Sikoraiová,
Prague Security Studies Institute

Prague Security Studies Institute

CHINA DEPLOYS BEIDOU TO PROJECT POWER AND INFLUENCE

Authors: Dr. Jana Robinson, Patrik Martínek, Jakub Pražák and Kristína Sikoraiová,
Prague Security Studies Institute

INTRODUCTION

The space domain is said to be "global" or "international". At the same time, space capabilities often reflect a country's level of technological development with implications for its global standing, as well as socio-economic and national security strength. Without question, it is China which has risen as the next „near-peer" challenger to United States space primacy.

Even Europe increasingly feels uneasy concerning Chinese firms and investors backed by Beijing acquiring European companies and their intellectual property as well as competing against them in their own marketplace. Indeed, in 2019, China was identified by the European Commission for the first time as an „economic competitor" and a „systemic rival". It would seem that European views on China are steadily converging with those of the U.S., despite differences over how to respond.

China has not only been modernizing and expanding its military at a rapid tempo (including a broad range of missile, naval and space capabilities), but has leveraged its economic strength to project power and influence internationally. An increasingly wealthy, self-confident, and authoritarian China has been building its network of partnerships through its Belt and Road Initiative (BRI), reportedly involving loans and investments of up to $1 trillion in infrastructure developments abroad.

BRI-related outreach has also involved delivering infrastructure and services in the space domain, including in the Global Navigation Satellite System (GNSS) sector. The so-called Space Silk Road (also known as the BRI Space Information Corridor) plans to connect various parts of the globe with Earth observation, communications and PNT services. By promoting BeiDou, China's global GNSS system, Beijing is seeking to embed its space ecosystem in some 138 BRI countries, and beyond.

This PSSI Perspective reviews how China uses its economic and financial (E&F) strategies and prowess in the GNSS sector to expand its global space footprint and advance its economic, strategic and military objectives. Proliferation of China's space-related technologies, including in the GNSS sector, are largely facilitated through the civil-military fusion strategy of the Chinese Communist Party (CCP) designed to establish globally-competitive military by 2049.

© 2021 Prague Security Studies Institute. All rights reserved.

CHINA'S GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) - BEIDOU

China started to develop its indigenous navigation system, BeiDou (BDS) in 1994 via the BDS-1 experimental satellite system over its territory. With significant prior assistance stemming from the EU-China collaboration, in 2017 Beijing initiated its third version of this system, BDS-3. In 2018, Ran Chengqi, director of China Satellite Navigation Office announced that BeiDou had expanded its services globally. BDS-3 was declared fully operational in August 2020, consisting of 27 Medium Earth orbit (MEO) satellites, 5 geostationary satellites (GEO), and 3 inclined geosynchronous orbit (IGSO) satellites. Based on BeiDou official statements, the contemporary global positioning accuracy for public uses is better than 10m, with enhanced performance in the Asia-Pacific region. Encrypted accuracy of positioning was estimated up to 0.1 meters. Higher accuracy is a licenced service restricted for authorized and military users only.

An independent global satellite navigation system is consistent with China's industrial plans, including its "Made in China 2025" and "China Standards 2035", both of which endeavor to make China emerge as the dominant industrial power by setting rules across industries, particularly new technologies. BeiDou is to become a "more ubiquitous, integrated and intelligent, comprehensive national positioning, navigation and timing (PNT)" by 2035. Regular BeiDou upgrades are also designed to support China's ambition to become a "global leader in space technology by 2045".

China has collaborated with all three of the other major GNSS providers, while developing BeiDou technology and interoperability. China has signed joint statements about civil signal compatibility and interoperability with the Russian Glonass, the American GPS and the European Galileo systems.

BeiDou has been ratified by various international standardization bodies such as the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the International Mobile Communications Partnership Project, and the COSPAS/SARSAT network for making distress calls at sea. All of these arrangements have enhanced the country's global reach.

Although Beijing's narrative supports the notion that compatibility and interoperability of the GNSS systems benefits the suppliers and service providers, there is a clear effort underway to promote BeiDou as an exclusive system for its customers. This strategy gives rise to opportunities for Beijing to break American GPS dominance in the GNSS sector, offering countries an alternative of assured and resilient PNT signal and bringing them into China's sphere of influence.

According to Chinese media, in 2019, the overall value of BeiDou-derived products and services was 345 billion yuan ($48.5 billion), which represented a year-on-year increase of 14,4%. In comparison, the market size of GPS was estimated to be $37.9 billion in 2017, with expected growth to $62.7 billion in 2020, $146.4 billion in 2025 and a compounded annual growth rate of 18.5% from 2018 to 2025. The overall value of the GPS downstream market has grown by some $1.4 trillion since 1983, with 90% of those gains realized after 2010. In short, the GNSS sector in recent years is increasingly profitable and China is prepared to compete aggressively for a higher market share.

GLOBAL CHINESE TRANSACTIONS IN THE GNSS SECTOR

BeiDou offers subscriber countries opportunities to manufacture goods, provide a broad range of services, or acquire specialized equipment not otherwise available to them. They range from civil (e.g., remote

© 2021 Prague Security Studies Institute. All rights reserved.

sensing, exploration, etc.), to commercial (e.g. navigation, precision surveying and mapping, etc.) to military (e.g. communications, UAVs, aircraft, ships, vehicles, air defence, etc.).

As described through the analysis of nine notable BeiDou transactions in as many countries (see related Figure 1 below), BeiDou offers a platform providing broad civil, commercial, and military benefits. Countries are accorded collaboration via installed ground stations for infrastructure (e.g., for calibration, maintenance, etc.), continuously operating reference stations (CORS) for improved local precision, and BeiDou-derived user equipment and services.

China often first offers seemingly benign civil and commercial cooperation that later leads to more strategic, and dependent relationships (e.g., Pakistan, Thailand, etc.). This technique has been successfully employed by China in other space subsectors, particularly in telecommunications and Earth observation. Beijing also actively leverages multilateral platforms to advance these strategic/military objectives (e.g. ASEAN or various regional fora).

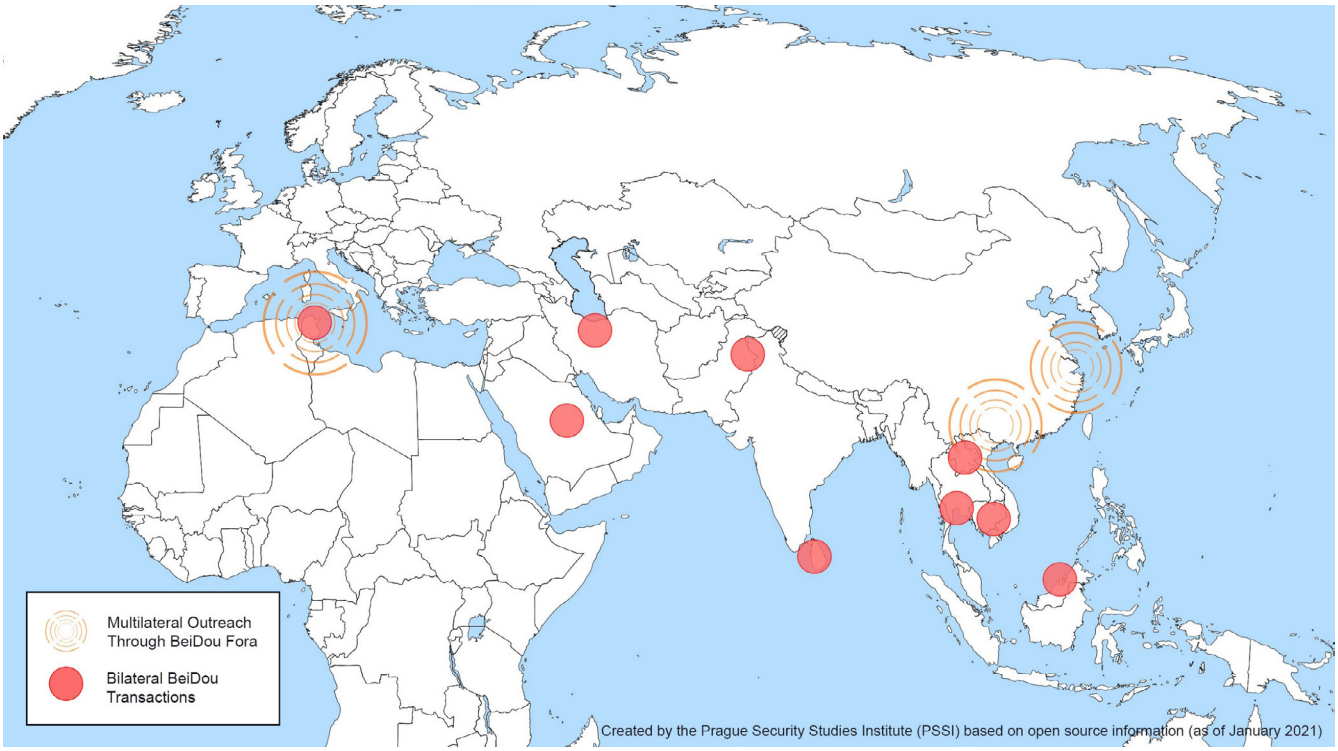

Figure 1: Bilateral Transactions and Multilateral BeiDou Outreach (Source: PSSI)

Building BeiDou's ground segment globally is critical for the system's accuracy, reliability, availability, and future development. In 2013, Thailand became the first BeiDou overseas client when Wuhan Optics Valley BeiDou Holding Group Co., Ltd. (China's vehicle for the national geospatial information industry), signed a 2 billion yuan ($322 million) agreement with Thailand to promote navigation services for disaster relief, power distribution and transport. That same year, it constructed in Thailand the first tranche of three CORS and a ground station, as well as an industrial park for the development and production of BeiDou receivers for the wider Southeast Asian market.

BeiDou technology has been included in the Thai government's economic development and construction plans and integrated into Thailand's infrastructure construction and industry projects, including the du-

© 2021 Prague Security Studies Institute. All rights reserved.

al-use applications of BeiDou technology. In March 2014, it was reported that the Royal Thai Army was considering the purchase of two new types of multiple rocket launcher systems from China using BeiDou technology.

In 2017, Wuhan Optics likewise initiated a China-ASEAN BeiDou Technology City project in Thailand under a 10 billion yuan ($1.45 billion) deal. In the same year, a similar project to expand coverage into Southeast and South Asia was initiated in Sri Lanka where Wuhan Optics planned to build ten CORS.

Other transactions include a 2019 MoU between Thai Satellite operator, Thaicom Plc, and China Great Wall Industry Corporation for the development of GNSS applications for Unmanned Aerial Vehicles.

In 2013, BeiDou agreements were also negotiated with Laos, Brunei, and Cambodia. CORS were built to increase BeiDou accuracy in the region.

Pakistan became the fourth overseas user of BeiDou in May 2013 through a cooperation agreement between the Chinese Satellite Navigation Office and the Pakistani Space and Upper Atmosphere Research Commission (SUPARCO). China installed five CORS and a processing center in Karachi that has been operated by Pakistan since May 2014. Pakistan became the first foreign nation with regional 2-centimeter positioning accuracy.

According to the 2017 report by the Congressional U.S.-China Economic and Security Review Commission, BeiDou-related infrastructure deals in Thailand, Brunei, Laos, and Pakistan, among others, were facilitated by heavily subsidized financing arrangements. This brand of below-market deal making is a common indicator that a transaction is more strategic, than strictly commercial, in nature.

The most conspicuous strategic economic and financial outreach involves defense-related agreements regarding the use of BeiDou PNT equipment. For example, secure radio communications depend on the precise timing signal and specialized waveforms (proprietary equipment) that are a foundational capability that opens the door to greater dependency on BeiDou-specific services. Iran, Pakistan and Saudi Arabia all concluded such BeiDou-related agreements. As a consequence, these countries have become more firmly entrenched in an alliance with China, advancing the latter's strategic objectives.

Pakistan is currently the only nation with the same access to military BeiDou as the People's Liberation Army (PLA). Its reliance on BeiDou is increasing, as China provides Pakistan with additional military equipment. Accordingly, some believe that Pakistan is on a path to fully replace the American GPS equipment with BeiDou.

China likewise took advantage of Iran's inability to gain access to GPS high-precision services and in 2015 signed a MOU with Tehran, which included the building of BeiDou ground stations and an Iranian center for space data collection (in concert with Iraninan Sa Iran defence electronics company). As part of the agreement, Iran reportedly gained access to BeiDou PNT equipment for Iranian missiles, unmanned aerial vehicles and other military capabilities, achieving more precise accuracy, effectiveness, and lethality. Similar to Pakistan, Iran is also interested in acquiring Chinese military equipment and pursuing trade partnerships with Beijing. In January 2021, Iran announced a deepening of its BeiDou-related relationship.

Beijing has also expanded its GNSS-related outreach through foreign hubs and fora. Notable venues for this outreach have been China-Central Asia BDS Cooperation Forum (held in Nanning, China, in 2019) and the China-Arab States BDS Cooperation Forum (held in Shanghai in 2018 and in Tunis in 2019). These fora

© 2021 Prague Security Studies Institute. All rights reserved.

include representatives of individual governments, industrial organizations and private sector enterprises, as well as international organizations such as the Eurasian Economic Forum and the Asia Pacific Space Cooperation Organization (APSCO). The latter's member states all have access to Chinese space training, ground stations, and satellite development projects.

One of widely advertised projects was the opening of the first "Overseas Centre of Excellence" in Tunisia in late 2018, a collaborative project linked to the China-Arab States Beidou Cooperation Forum referenced above. The Centre's stated goal is to promote the expansion of BeiDou in the Middle East, including BeiDou-related research and training.

CONCLUSION

China has leveraged its economic strength to project power and advance its strategic aims globally. Its economic and financial (E&F) strategies in the GNSS sector have helped expand its global space footprint and propel its economic, strategic and military objectives in a manner reinforcing its industrial and civil-military fusion policies.

According to China's official website and state media, BeiDou-related products/services have already been exported to more than 120 countries and are used by hundreds of millions of people for various civil, commercial, and military applications, especially in Asia, Africa, Middle East and Eastern Europe.

Through the establishment of seemingly benign civil and commercial cooperation, China has positioned to one day become the primary supplier of GNSS infrastructure, equipment and services worldwide, gaining access to a wide array of local markets (often through non-market transactions and financing arrangements).

These market „beachheads" are routinely designed to usher in inordinate space-related dependencies of strategic consequence not available to the targeted country elsewhere (e.g., Iran). These deals are often facilitated by below-market pricing and financing terms, indicating clearly that they are not strictly commercial transactions.

These ambitious BeiDou objectives should not continue to go largely uncontested by the allies. This grab for global market share is a worrying trend from a security, strategic, and commercial perspective and does not bode well for either Galileo or GPS.

©2021 Prague Security Studies Institute. All rights reserved.