



NATO, Emerging Technologies, and Taiwan's Potential Cooperative Security Role in the Indo-Pacific

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July 2021

Abstract

Both China's rise and emerging disruptive technologies (EDT) have become critical issues for NATO. As the alliance seeks to enhance science and technology cooperation with like-minded states in the Indo-Pacific, this provides an opportunity for Taiwan to play a potentially greater role in cooperative security in the region.

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Analysis

On June 14, 2021, NATO leaders convened for a summit in Brussels and expressed concern over China's behavior as a "systemic challenge" to the security of the NATO alliance.¹ The following day, the People's Republic deployed a dozen warplanes to swarm Taiwan's air defense zone in what *Newsweek* describes as "gray-zone" activity to display Beijing's displeasure.² Against this backdrop, NATO's new emphasis on China reveals that the attention of the alliance is shifting eastward from its traditional focus on Russia and Europe's immediate neighborhood. Moreover, the alliance is especially concerned about Beijing's global power in high technology. In response to cyber, space, artificial intelligence (AI), and other asymmetric threats enabled by emerging and disruptive technologies (EDT), NATO needs to adapt to China's military rise in areas where it poses a challenge to the alliance. As observed by Kate Hansen Bundt, Secretary General of the Norwegian Atlantic Committee, this includes China's ambitions in the development of technology standards and global governance, and its "race to control and influence the global digital infrastructure."³

Simona Soare noted in a recent German Marshall Fund policy brief that, while NATO is concerned with Russia's adoption of EDTs, "Chinese investment and leadership ambitions in the adoption of these technologies is the main geopolitical driver behind allied innovation plans."⁴ In June 2020 NATO created an Advisory Group on Emerging and Disruptive Technologies to develop an allied innovation ecosystem with partners and external EDT stakeholders.⁵ In April 2021, the NATO Parliamentary Assembly issued a report on how NATO should enhance science and technology (S&T) cooperation with Asian partners to further its mission.⁶ Given that Asia-Pacific nations such as Japan, South Korea, Singapore, and Taiwan are leaders in the development of EDTs (as well as semiconductors that enable these technologies), this provides an opportunity for them to partner with NATO—and to enhance the transatlantic alliance's defense technological edge, alongside their own.

¹ NATO, Brussels Summit Communiqué, June 14, 2021,

https://www.nato.int/cps/en/natohq/news_185000.htm?selectedLocale=en

² John Feng, "China's Warplanes Swarm Around Taiwan After G7, NATO Talk Up Threat", *Newsweek*, June 15, 2021,

<https://www.newsweek.com/china-warplanes-swarm-around-taiwan-after-g7-nato-talk-threat-1600632>. According to a 2019 report by the Center for Strategic and International Studies (CSIS), "gray-zone" activities are below the threshold of escalation which allow an actor to advance its interests while avoiding military conflict with an adversary. https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/190708_Hicks_GrayZone_interior_v3_FULL_WEB_final.pdf. In the case of China's gray-zone activities towards Taiwan, Eric Chan—adjunct fellow at the Global Taiwan Institute and senior airpower strategist for the U.S. Air Force, argues that China is engaged in a coordinated gray-zone warfare campaign "that seeks to exhaust Taiwan's defense forces and undermine the morale of Taiwanese people." For further information, please see *Global Taiwan Brief*, Vol. 6, Issue 11, June 2, 2021. <https://globaltaiwan.org/2021/06/vol-6-issue-11/#EricChan06022021>

³ Judy Dempsey, "Judy Asks: Is NATO Ready for China?", *Strategic Europe*, June 17, 2021,

<https://carnegieeurope.eu/strategieurope/84798>

⁴ Simona R. Soare, "Innovation as Adaptation: NATO and Emerging Technologies", *German Marshall Fund Policy Brief*, June 11, 2021,

<https://www.gmfus.org/publications/innovation-adaptation-nato-and-emerging-technologies>

⁵ NATO Advisory Group on Emerging and Disruptive Technologies, *Annual Report 2020*,

https://www.nato.int/nato_static_fl2014/assets/pdf/2021/3/pdf/210303-EDT-adv-grp-annual-report-2020.pdf

⁶ Nusrat Ghani, "Enhancing NATO S&T Cooperation with Asian Partners", Preliminary Draft General Report, NATO

Parliamentary Assembly Science and Technology Committee, April 15, 2021, <https://www.nato-pa.int/download-file?filename=/sites/default/files/2021-04/023%20STC%2021%20E%20-%20ST%20COOPERATION%20-%20GHANI%20-%20FINAL.pdf>



Science, Technology, and Security in the Indo-Pacific

The NATO Parliamentary Assembly report notes that S&T cooperation with Asian partner nations has been an “underexplored pillar” in NATO’s partnerships. This could have important implications for Taiwan. As the author Nusrat Ghani has argued, throughout history we have seen how science, technology and security are “deeply intertwined,” when “armed forces equipped with the more advanced technologies and the deeper understanding of their application in military operations, usually enjoyed victory on the battlefield, while those that failed to keep pace were often defeated.” For example, he noted how “the English Navy defeated the much larger Spanish Armada” by “relying on advanced naval technology”, and how “British innovations in radar technology also played a decisive role in the Allies’ victory.”⁷

EDTs will have important impacts on both Indo-Pacific and transatlantic security. To that end, NATO’s Science and Technology Organization (STO) has identified eight EDTs—including AI, big data and advanced analytics (BDAA), hypersonic weapons, and space technology—as technologies likely to have a salient effect on the future security landscape.⁸ Most importantly, these technologies depend on the input of advanced semiconductors, with Taiwan—and especially Taiwan Semiconductor Manufacturing Company (TSMC, 台灣積體電路製造)—standing as one of the most important nodes in the global semiconductor supply chain.⁹ TSMC controls more than half of the global market for foundry services (i.e., manufacturing chips for others), with prominent clients such as Apple and Qualcomm. Taiwan’s semiconductors are used in a wide array of fields, to include automotive manufacturing, and production of US Air Force F-35 fighters, as well as in equipment for 5G communications, quantum computing, and biotechnology.¹⁰

Semiconductors are also important for other weapons such as unmanned aerial vehicles (UAVs).¹¹ In a recent article Franz-Stefan Gady from the International Institute for Strategic Studies illustrated how EDTs could

⁷ Nusrat Ghani, “Enhancing NATO S&T Cooperation with Asian Partners”, NATO Parliamentary Assembly Science and Technology Committee (STC), Preliminary Draft General Report, April 15, 2021, p.1, <https://www.nato-pa.int/download-file?filename=/sites/default/files/2021-04/023%20STC%2021%20E%20-%20ST%20COOPERATION%20-%20GHANI%20-%20FINAL.pdf>; Tim Hartford, “How the search for ‘death ray’ led to radar”, *BBC*, October 9, 2017, <https://www.bbc.com/news/business-41188464>

⁸ <https://www.nato-pa.int/download-file?filename=/sites/default/files/2021-04/023%20STC%2021%20E%20-%20ST%20COOPERATION%20-%20GHANI%20-%20FINAL.pdf>

⁹ Christina Lin, “Transatlantic Security and Taiwan in the Global Semiconductor Supply Chain”, *Global Taiwan Brief*, Vol. 6, Issue 5, March 10, 2021, <https://globaltaiwan.org/2021/03/vol-6-issue-5/#ChristinaLin03102021>; Alan Crawford, Jarrell Dillard, Helene Fouquet, Isabel Reynolds, “The World is Dangerously Dependent on Taiwan for Semiconductors”, *Bloomberg*, January 25, 2021, <https://www.bloomberg.com/news/features/2021-01-25/the-world-is-dangerously-dependent-on-taiwan-for-semiconductors>

¹⁰ Lauly Li and Cheng Ting-Fang, “TSMC eyes plans for first chip plant in Japan”, *Nikkei Asia*, June 10, 2021, <https://asia.nikkei.com/Business/Tech/Semiconductors/TSMC-eyes-plans-for-first-chip-plant-in-Japan>; Ralph Jennings, “TSMC gears up for mass production of 3-nanometre chips for high-end computers and 5G phones”, *South China Morning Post*, January 18, 2021, <https://www.scmp.com/tech/innovation/article/3118183/tsmc-gears-mass-production-3-nanometre-chips-high-end-computers-and>; Mike Tyson, “TSMC to work with Taiwan Govt on Quantum Computer”, *Hexus*, December 18, 2018, <https://hexus.net/tech/news/cpu/125480-tsmc-work-taiwan-govt-quantum-computer/>; Stephen Ezell, “The Future of Taiwan: Semiconductors Alone Make the Island’s Continued Freedom Crucial to the U.S.”, *Discourse Magazine*, April 16, 2021, <https://www.discoursemagazine.com/politics/2021/04/16/the-future-of-taiwan-semiconductors-alone-make-the-islands-continued-freedom-crucial-to-the-u-s/>

¹¹ “How Semiconductor Advancements Will Impact Drone Technology?”, *Semiconductor Review*, January 3, 2020, <https://www.semiconductorreview.com/news/how-semiconductor-advancements-will-impact-drone-technology-nwid-50.html>



degrade US and Taiwan military capabilities in a Sino-US confrontation over Taiwan.¹² The scenario involved the People's Liberation Army (PLA) employing swarms of unmanned combat aerial vehicles (UCAVs) against Taiwan's air defense system, and unmanned underwater vehicles (UUVs) against US naval vessels. Countering cyberattacks and preserving the integrity of critical infrastructure are another priority for transatlantic security. According to NATO officials at a recent conference convened by the NATO Defense College Foundation, the alliance has placed technology and innovation as one of its top priorities for a new strategic concept.¹³ As NATO's Assistant Secretary General for Public Diplomacy Baiba Braze noted, in the face of China's rise, the alliance needs to build resilience in infrastructure and supply chain, and she underscored the need to preserve NATO's technological edge.¹⁴ Former NATO Assistant Secretary General for Public Diplomacy Tacan Ildem likewise observed that China is the "biggest new challenge" that needs to be updated in the new strategic concept, including China-related "emerging and disruptive technologies" that present both opportunities and challenges.¹⁵ As such Ildem argued NATO needs to maintain its technological edge, and that "Innovation should be at the heart of the work of NATO." The alliance is also considering upgrading S&T cooperation with Asian partners, and to that end, Taiwan can play a potential cooperative security role and help contribute to Indo-Pacific regional security.

Taiwan as a Potential Enhanced Opportunities Partner?

NATO's Asian partners, such as Japan and South Korea, are considered world leaders in multiple EDT sectors. Accordingly, in February 2021 Japan was approved to be an Enhanced Opportunities Partner (STO-EOP) of the NATO Science and Technology Organization.¹⁶ The STO-EOP framework is key to NATO's S&T collaboration, which offers more tailored access to NATO structures and processes. As explained by the NATO Parliamentary Assembly Report, the "overall proficiency of the network allows each participant to overcome S&T deficiencies." This is important for smaller economies (e.g., Sweden, Singapore, or Taiwan) that "lack the economic capacity to engage in multiple technology sectors, but nonetheless possess niche technological specialization." Singapore, for one, has been involved in STO events on the strategic and planning level despite not being a NATO Asian partner. Taiwan could potentially engage in similar cooperative security exchanges given that the NATO Science and Technology Board is considering inviting more Asian nations to become STO-EOP partners, especially in the field of maritime technologies.¹⁷

In another report titled "NATO and the Asia Pacific" published by the NATO Association of Canada, Christina Lai from Taipei-based Academia Sinica argued that NATO's STO-EOP program is a good way to enhance cross-regional cooperation.¹⁸ In 2014, Australia, Jordan, and Sweden became EOP partners, and thereby helped set a

¹² Franz-Stefan Gady, "How Chinese unmanned platforms could degrade Taiwan's air defence and disable a U.S. Navy carrier", International Institute for Strategic Studies Analysis, June 9, 2021, <https://www.iiss.org/blogs/analysis/2021/06/china-taiwan-unmanned-platforms>

¹³ NATO Defense College Foundation, "NATO 2021: Rebuilding the Consensus for a New Era", Rome, Italy, June 9-10, 2021, <https://www.natofoundation.org/nato-2021/>

¹⁴ https://www.youtube.com/watch?v=XUtT_GFGgAI&t=2695s

¹⁵ https://www.youtube.com/watch?v=XUtT_GFGgAI&t=2695s

¹⁶ Ghani, *Ibid.*

¹⁷ Ghani, *Ibid.*

¹⁸ Christina Lai, "Is "Asian NATO" an oxymoron? Prospects of NATO's political engagement and strategic alignment in the Asia-Pacific" in Joseph McQuade and Bonnie Lao eds, *NATO and the Asia-Pacific*, The NATO Association of Canada, Fall 2020, <https://natoassociation.ca/wp-content/uploads/2020/12/NAOC-Fall-2020-Issue.pdf>



precedent for Asia-Pacific countries to join. According to Christina Lai, cybersecurity has emerged as a key concern, and therefore both the alliance and Asian states on the receiving end of cyberattacks from China and North Korea could benefit from a more coordinated response. With Taiwan already recognized as a *de facto* major non-NATO ally (MNNA), and given its unique role as the world's semiconductor industry leader, extending STO-EOP to Taiwan would further support NATO's innovation mission and help maintain a defense technological edge for the alliance and its partners.¹⁹

Moreover, this would present an opportunity for NATO to foster cohesion within the transatlantic alliance and upgrade ties with its Asian partners. Traditionally, the transatlantic approach towards the rise of China has been acknowledged as a division of labor: one involving Washington's pivot to the Pacific, and Brussel's focus on Russia.²⁰ However, this approach risked eroding the transatlantic bond over time.²¹ Now, with the globalization of China's Belt and Road Initiatives (BRI) across Eurasia, the United States and Europe find themselves pivoting west of the Malacca Strait and east of Suez to meet in the Indo-Pacific. As Taiwan and other like-minded democracies engage in cooperative security in the Indo-Pacific to diversify their S&T and semiconductor supply chains, this could eventually lead to broader engagement in other areas—and in NATO centers of excellence (COE) such as those for cyber defense in Tallinn, Estonia, strategic communications in Riga, Latvia, and naval mine warfare in Belgium. Thus, this could provide an opportunity for Taiwan to be a security actor in its own right, rather than subsumed under China within a conventional US-China security paradigm.

Engagement with the Quad and NATO's partners in the Indo-Pacific would also help to build international trust for Taiwan, and improve Taiwan's defense capabilities—thereby enabling Taipei to help with burden-sharing for regional security. Finally, as Ou Wei-chun (歐瑋群) has argued in *Taipei Times*, Kaohsiung Port could become a cooperative security location (CSL) for NATO and its partners, especially now that the United States no longer has access to Hong Kong's port.²² With NATO Secretary General Stoltenberg proposing a NATO-Asia Pacific Summit in 2022, the possibility of Taiwan's potential cooperative security role as an enhanced opportunities partner should be further explored next year.²³

¹⁹ <https://uscode.house.gov/statviewer.htm?volume=116&page=1428>; Yang Jie, Stephanie Yang, Asa Fitch, "The World Relies on One Chip Maker in Taiwan, Leaving Everyone Vulnerable", *Wall Street Journal*, June 19, 2021,

<https://www.wsj.com/articles/the-world-relies-on-one-chip-maker-in-taiwan-leaving-everyone-vulnerable-11624075400>

²⁰ Christina Lin, "China's Pivot West: Opportunities for Cooperative Security" in Alexander Moens and Brooke A. Smith-Windsor eds., *NATO and Asia-Pacific* (Rome: NATO Defense College, 2016) pp.219-

235, <https://www.ndc.nato.int/news/news.php?icode=915>; Christina Lin, "Cooperative Security with China and the Post-Arab Spring Mediterranean Security Architectures" in *Liberal Order in a Post Western World*, by Trine Flockhart, Charles Kupchan, Christina Lin, Bartłomiej Nowak, Patrick Quirk, Lanxin Xiang, The German Marshall Fund's Transatlantic Academy Collaborative Report, April 2014, pp. 121-133, <https://www.gmfus.org/publications/liberal-order-post-western-world>.

²¹ Christina Lin, "China's Mediterranean Presence is an Opportunity for NATO", *German Marshall Fund Blogpost*, April 29, 2014, <https://www.gmfus.org/blog/2014/04/29/china-s-mediterranean-presence-opportunity-nato>

²² Ou Wei-chun, "Kaohsiung should host U.S. Navy", *Taipei Times*, June 25, 2020, <https://www.taipetimes.com/News/editorials/archives/2020/06/25/2003738816>

²³ NATO Private Office of the Secretary General, "Food for Thought Paper: NATO 2030—a Transatlantic agenda for the Future", February 11, 2021, <https://www.rijksoverheid.nl/documenten/vergaderstukken/2021/02/11/food-for-thought-paper-nato-2030-a-transatlantic-agenda-for-the-future>



Comment: Opinions expressed in this contribution are those of the author. The article was first published in *Global Taiwan Brief* Vol. 6, Issue 13, June 30, 2021.

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