Research Institute for Democracy, Society, and Emerging Technology

National Security

Drones for Democracy

U.S.–Taiwan Cooperation in Building a Resilient and China-Free UAV Supply Chain

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About National Security Research Group of DSET

The National Security Research Group at DSET conducts research and provides policy recommendations on dual-use technologies. Our focus includes building a China-free drone supply chain domestically and supporting democratic allies by supplying drones and drone components. We also prioritize enhancing communication resilience through trusted satellite communication service providers and strengthening the protection of submarine cables. Additionally, we assess the alignment of Taiwan's military strategy with that of our allies from strategic to operational levels.

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    a. Since the outbreak of the war in Ukraine in 2022, Taiwan's uncrewed aerial vehicle (UAV) policy has undergone a significant transformation. What began as a national capability-building initiative—the "National UAV Team" launched under President Tsai Ing-wen (2020–2024)—has evolved into a broader strategic vision under President Lai Ching-te (2024–). This new vision seeks to position Taiwan as an "Asia-Pacific UAV hub," serving as a regional center for a China-free, dual-use drone supply chain.

    b. The strategy focuses on expanding Taiwan's commercial-grade UAV production capacity—through increased defense procurement and the development of overseas markets—to ensure a self-reliant UAV supply chain in the event of a Taiwan Strait contingency.

    c. To support these ambitions, the Lai administration has identified three core objectives for its 2025 UAV strategy:

        i. Promoting industrial development

        ii. Strengthening defense self-reliance

        iii. Deepening integration into democratic supply chains

Key Findings on Challenges Facing Taiwan's UAV Industry

1. **Taiwan's uncrewed aerial vehicle (UAV) Industry Nearly Doubles in Value, Exports Surge Tenfold Since 2023, but Gaps to Targets Remain**

    a. Taiwan's UAV sector has experienced rapid growth:

        i. The industry value has increased from NT$2.8 billion (US$87 million) in 2023 to NT$5 billion (US$155 million) in 2024

        ii. Exports grew **tenfold** from 290 units (2023 H2) to 3,473 units (2024), with total export value exceeding **US$2.3 million**; Q1 2025 alone saw 3,426 units exported—nearly matching 2024's full-year total.

        iii. Estimated **annual production capacity (from April 2024-April 2025)** is between **8,000 and 10,000 units.**

b. However, structural challenges remain, as production still falls well short of the government's 2028 target of 180,000 units

2. **Structural Limitations for Taiwan's UAV industry: Limited Scale, Foreign Technology Reliance, and Supply Chain Bottlenecks.**

   a. **Limited Production Scale**

   Taiwan's UAV production scale remains limited due to high manufacturing costs, low domestic procurement, and minimal foreign government orders.

   i. High manufacturing costs: Taiwan's UAV industry relies on non-PRC components, which significantly increases unit prices. For example, SDR video transmission chips imported from allied countries can cost up to 10 times more than DJI's in-house chips. This makes it difficult for Taiwanese products to compete with Chinese-made products in the commercial market.

   ii. Low domestic procurement: The Ministry of National Defense's 3,422-unit, NT$6.8 billion (US$210 million) order, awarded in August 2024, remains the largest government purchase to date and serves as a primary driver of the industry. However, apart from this order, purchases by other government departments remain limited. The government announced a new UAV procurement plan in May 2025 for 47,000 units over the next four years, which will become the largest cross-department UAV procurement to date. However, as of the publication date of this report (June 2025), this procurement has not yet been included in the government budget.

   iii. Limited foreign government procurement: Currently, no publicly known foreign government (besides U.S. state-level agencies) has procured Taiwanese UAVs. Key barriers for foreign procurements include:

      1. Absence of internationally recognized certifications (e.g., Blue UAS, Green UAS)

      2. Lack of robust flight testing infrastructure: Taiwanese drones lack real-world performance validation compared to allied UAVs, especially the lack of testing experience on the battlefield

in Ukraine. Over 4,300 restricted flight zones in Taiwan, overlapping agency jurisdictions, and slow approval processes further constrain testing and commercialization.

3. Difficulty competing with low-cost Chinese drones, which remain widely adopted even by U.S. agencies

b. **Technology Gaps and Components Dependencies**

i. Although Taiwan has achieved “China-free” status in final assembly, several critical technologies still depend on allied imports, including:

1. Three Chips: flight control, positioning, and communication chips

2. Two Software: flight control and positioning software

3. Gimbal camera; thermal camera

ii. Key reason for this dependency:

Despite Taiwan’s global leadership in IC manufacturing, design, and electronic components, the small size of the UAV market and limited commercial returns have discouraged major Taiwanese tech firms from investing in the development of dedicated UAV chips and critical modules.

c. **Supply Chain Bottlenecks**

Beyond reliance on key technologies, Taiwan’s module materials may face supply constraints from China, while military-grade components are subject to U.S. ITAR export controls.

i. U.S. export controls: Thermal imaging modules remain subject to restrictions.

ii. Chinese material dependency:

iii. Battery cells rely on core materials (e.g., cathode/anode components) sourced from China

iv. Electric motors rely on magnets made from China-sourced rare earth elements

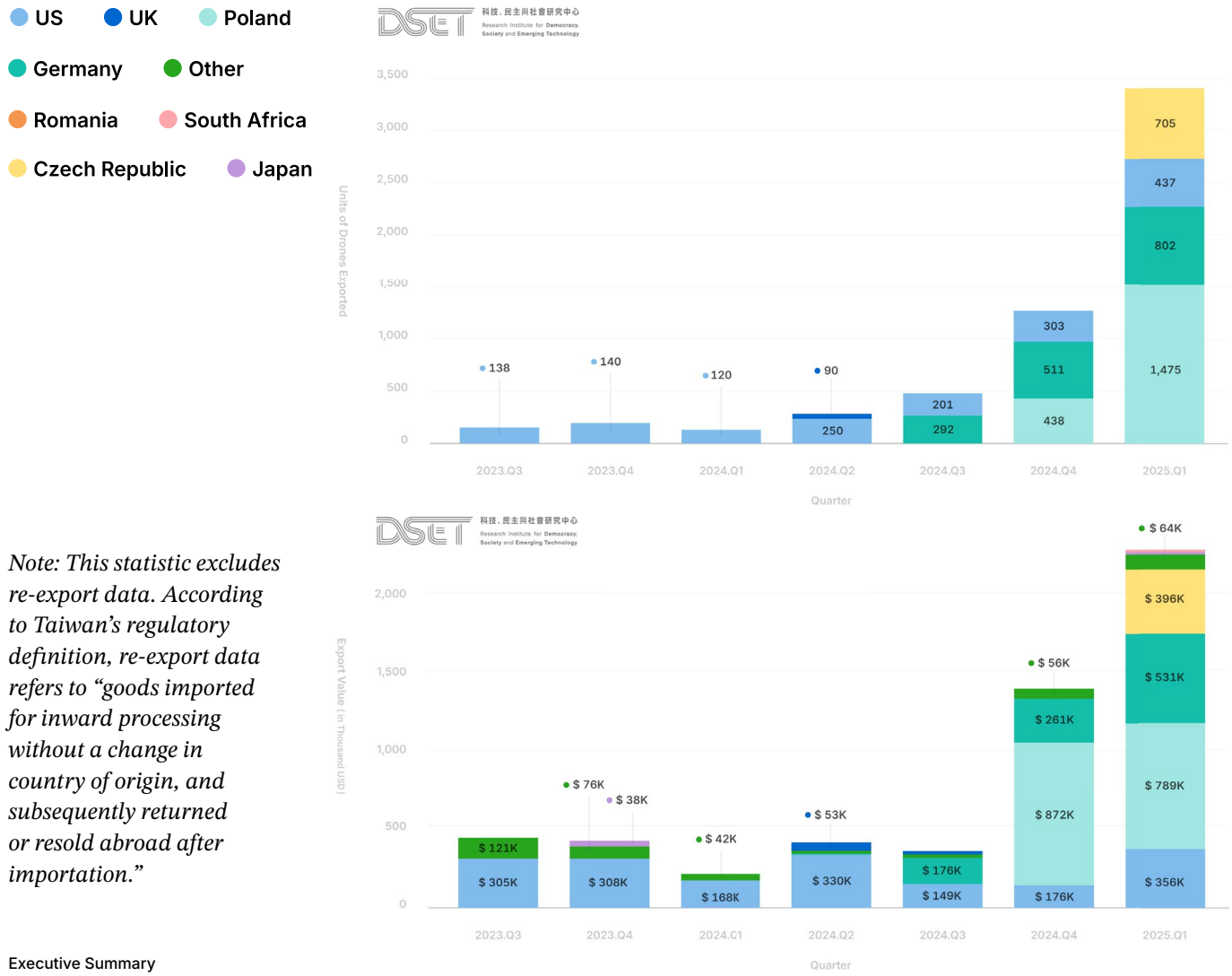
Progress in US-Taiwan Cooperation

1. **Taiwan's UAV Export Destination: U.S. Growth Continues, but EU Becomes Primary Destination**

   a. The United States was initially Taiwan's sole UAV export market. In the second half of 2023, 278 units were exported to the U.S., valued at US$613,000.

   b. While exports to the U.S. continued to grow in 2024 and early 2025, the European Union has since overtaken the U.S. as the leading destination. In 2024, Taiwan exported 874 units to the U.S. (US$823,000) and 1,323 units to the EU (US$1.36 million). By Q1 2025, exports to the U.S. reached 437 units (US$356,000), while exports to the EU surged to 2,982 units (US$1.72 million).

   c. By Q1 2025, the top three destinations for Taiwanese UAVs were Poland, Germany, and the Czech Republic.



Note: This statistic excludes re-export data. According to Taiwan's regulatory definition, re-export data refers to "goods imported for inward processing without a change in country of origin, and subsequently returned or resold abroad after importation."

2. **U.S. Market Access Limited to US State-Level Procurement**

   Taiwanese UAV exports to the U.S. remain limited, primarily restricted to state-level government procurement.

   a. *No* publicly known Taiwanese UAVs are present in the U.S. commercial market, mainly due to higher prices compared to Chinese competitors.

   b. As of May 2025, *no* Taiwanese UAV manufacturer has secured U.S. federal procurement contracts or been included in the U.S. DoD's Blue UAS list (used for defense procurement) or the industry-led Green UAS list (used by non-defense federal agencies and local governments).

   c. The *only* publicly known export case involves Taiwan-based Coretronics, which has supplied drones to state-level police, firefighting, and public safety departments.

3. **U.S.-Taiwan UAV cooperation lacks formal co-production and integration structures**

   Unlike legacy U.S.–Taiwan defense programs such as the F-16 or recent UAV partnerships with close allies like Japan and South Korea, drone collaboration between Taiwan and the United States remains limited to **subsystem-level integration**. Taiwan plays an increasingly important role in supplying critical modules—such as secure communications, ground control systems, and ISR payloads—but lacks formal arrangements for final assembly, co-design, or long-term sustainment.

   This contrasts with the broader progression of defense-industrial cooperation seen in other allied cases:

   a. **Maintenance and Sustainment**
   Taiwan has depot-level maintenance rights for its F-16 fleet, enabling localized repair and operational resilience. However, it has **no equivalent authority for U.S.-origin UAVs** like the MQ-9B or ALTIUS. All maintenance remains U.S.-based, undermining Taiwan's ability to service its fleet independently in a contingency.

   b. **Subsystem Adaptation with U.S. Support**
   Taiwan's UAV firms are increasingly capable of providing secure subsystems, mirroring earlier experiences from the IDF program. However, **they remain excluded from the U.S. Blue UAS and Green**

UAS lists, and face **misaligned certification and export control processes** under ITAR/EAR. This severely limits their ability to scale exports, enter allied markets, or position Taiwan as a trusted subsystem source.

c. **Final Assembly and Co-Production**
Japan's F-35 Final Assembly and Check-Out (FACO) facility illustrates how the U.S. partners with allies to build localized manufacturing capacity. Despite procuring over 980 U.S.-origin drones, **Taiwan has not been designated as a FACO site.** This prevents Taiwan from customizing UAVs for its operational environment, building sustainment capacity, or preparing for surge production in wartime.

d. **Co-Design and Co-Development**
In April 2025, South Korea's Hanwha Aerospace partnered with General Atomics to **co-develop and produce** the MQ-1C Gray Eagle STOL UAV. With a ₩ 300 billion KRW (US$203.5 million) investment, the agreement gives South Korea a platform-level stake in next-generation U.S. systems. Taiwan has **no such co-design mechanism**, and despite supportive language in recent NDAAs, **no institutional framework currently exists** to pursue joint development.

While subsystem integration has emerged as a starting point, Taiwan's lack of higher-tier cooperation mechanisms presents **five core challenges:**

a. **No Final Assembly or Sustainment Rights**
Taiwan has not received FACO designation or sustainment authorization for MQ-9B or ALTIUS drones. This restricts its ability to conduct local maintenance, apply region-specific upgrades, or prepare for surge capacity in crisis scenarios.

b. **No Co-Design Mechanism or Platform-Level Collaboration**
Unlike trusted allies such as South Korea, Taiwan lacks a formal co-development channel with the United States. Without shared R&D structures, Taiwan remains on the outside of next-generation platform innovation.

c. **Subsystem Integration Without Certification or Market Access**
Although Taiwan provides cost-effective components, the absence of certification pathways—especially access to Blue UAS and Green UAS—prevents broader adoption across U.S. and allied markets. Export controls, IP misalignment, and regulatory fragmentation further delay

deployment.

d. **Fragmented Interagency Coordination Across Both Governments**
Taiwan's drone-related responsibilities are split across MND, MOEA, and MOTC, while U.S. roles span DoD, State, and DIU. Without a joint coordinating platform, production planning, testing, export alignment, and platform integration remain disjointed.

e. **Lack of Legal or Institutional Recognition as a Strategic Industrial Partner**
Taiwanese OEMs and ODMs face investment risk due to the absence of a formal designation or codified cooperation framework under U.S. law (e.g., NDAA authorization). This undermines incentives to invest in long-term R&D, tooling, or workforce development.

Progress in Taiwan's Key UAV Policies

1. **Drones are foundational to Taiwan's and U.S. defense strategies.**

    1. Taiwan has integrated UAVs across the phases of its defense doctrine; the U.S. is embedding them in Indo-Pacific deterrence concepts like Replicator and Hellscape. Both countries now treat drones as essential for ISR, survivability, and tempo of operations.

    2. According to the Ministry of National Defense (MND) of Taiwan, the UAV procurement plan for the period 2022 to 2028 includes:

        a. **Procurement from the United States:** *980 units*, including 4 MQ-9B SkyGuardian, 291 ALTIUS 600M-Vs, and 685 Switchblade 300.

        b. **Indigenously developed military-grade UAVs:** *700 units* across five models, produced by the National Chung-Shan Institute of Science and Technology (NCSIST).

        c. **Commercial-grade, military-use UAVs:** *3,422 units* across six models, procured from Taiwanese private-sector manufacturers.

2. **MND's Landmark 2024 UAV Tender——3,422 Units, $211M**

    - The 2024 MND procurement, the largest-ever commercial-grade drone tender, is a key industry driver: NT$6.8 billion (US$210 million) for 3,422 ISR drones across Group 1–3 UAVs (by U.S. DoD standards), with

deliveries scheduled from 2025 to 2028.

- Separately, Taiwanese companies are developing FPV loitering munitions, though these systems are not yet included in MND procurement pipelines.

3. **Production and Value Targets — 180K Units/Year by 2028, US$1.24 Billion by 2040**

   - The Lai administration has identified UAVs as a strategic industry, with policy goals that include: (1) Increasing annual production value from NT$5 billion (US$155 million) in 2024 to **NT$40 billion (US$1.24 billion) by 2030** and (2) reaching an annual output of **180,000 UAVs by 2028.**

4. **Committed Procurement: 47,000 UAVs (2025–2028)**

   - In 2025, the government pledged to procure 47,000 UAVs for government agencies—its largest procurement plan to date.

5. **Key Challenges to Taiwan's Five UAV Strategies**

   In response to the challenges outlined above, the Taiwanese government introduced five strategies in 2025 to enhance the UAV industry. The five strategies and their associated challenges, as identified in this report, are as follows:

   - **Strategy I: Market Expansion** – Challenges persist due to fragmented government procurement planning, high production costs, and limited access to U.S. and EU government markets.

   - **Strategy II: Technology Development** – Taiwan faces weak industry incentives for IC designers and major tech firms to engage in R&D, along with continued dependence on imported key technologies from allies and raw materials from China.

   - **Strategy III: Industrial Cluster Formation** – Political resistance and dispersed production undermine efforts to establish an integrated UAV ecosystem.

   - **Strategy IV: Regulatory and Cybersecurity Alignment** – Certification barriers, cyber threats, and limited testing infrastructure constrain international market readiness.

   - **Strategy V: Defense Resilience** – Budget constraints and a lack of centralized planning hinder broader UAV adoption across national security agencies.

Table 1: Summary of Progress in Taiwan's UAV Industry and U.S.–Taiwan Cooperation

Taiwan's UAV Policy Objectives	Lai Administration's three objectives (proposed 2025) 1. Promoting industrial development 2. Strengthening defense self-reliance 3. Deepening integration into democratic supply chains
Ministry of National Defense's UAV Procurement Plan (2024–2028)	• **U.S.-origin UAVs**: 980 units – including 4 MQ-9B SkyGuardian, 291 ALTIUS 600M-Vs, and 685 Switchblade 300s • **Domestic military-grade UAVs**: 700 units – across five models developed by NCSIST • **Domestic Commercial-grade UAVs for military use:** 3,422 units – across six models from private-sector firms (2024 MND tender)
Production Goals	• **Production goal:** 8,000–10,000 units/year (April 2024–April 2025) → 180,000 units per year by 2028; • **Industry value:** NT$5 billion (US$155 million) in 2024 → NT$30 billion (US$938 million) by 2028.
Export Growth	• 2023 (H2): 290 units (US$613,000)→ • 2024 (Full year): 3,473 units (US$2.3 million)→ • 2025 (Q1): 3,426 units (US$2.08 million)
Top Export Designations	• **2023:** United States • **2024–2025 Q1:** Poland, Germany, and the Czech Republic
Tech Dependence on Foreign Suppliers	• Three Chips: flight control, positioning, and communication chips • AI image sensor module • Two Software: flight control and positioning software • Gimbal camera; thermal camera
Government Procurement	• **August 2024 Awarded:** MND landmark tender for 3,422 units valued at NT$6.8 billion (US$210 million) — the largest to date. • **May 2025 Committed:** New cross-government agency procurement plan announced, targeting 47,000 UAVs to be acquired between 2025 and 2028.
U.S. Market Accrss	• **Commercial Market:** No publicly known exports. • **State-Level Government Procurement:** One UAV firm (Coretronic) has secured contracts. • **Federal Government Procurement:** No publicly known cases. • **Blue UAS / Green UAS Lists:** No Taiwanese UAV firms, components, or modules included.
US-Taiwan UAV cooperation	• **Subsystems Supply Chain Cooperation:** Negotiations underway (Ministry of National Defense, March 2025) • **Co-Production / Final Assembly Agreements:** No publicly known ongoing negotiations • **Co-Design Mechanism** (e.g., U.S.–South Korea on MQ-1C; U.S.–Japan on F-35): No publicly known ongoing negotiations • **Maintenance Contracts** (e.g., U.S.–Taiwan cooperation on F-16): No publicly known ongoing negotiations

Policy Recommendations

Recommendation 1: Institutionalize Comprehensive National UAV Procurement Planning and Advance U.S.–Taiwan Collaborative Knowledge Sharing

- The Ministry of National Defense should formulate a long-term, comprehensive UAV procurement roadmap that delineates specific platform categories, operational roles, and volume forecasts, drawing upon the U.S. Department of Defense's Unmanned Systems Integrated Roadmap (2017–2042) as a guiding framework.
- The Executive Yuan's UAV/USV Task Force must centralize and standardize civilian UAV procurement, consolidating fragmented requests from law enforcement, emergency services, and coast guard agencies into a coordinated national strategy informed by international best practices.
- The U.S. Department of Defense, through the Defense Innovation Unit, should intensify knowledge transfer regarding acquisition methodologies and the implementation of Blue UAS certification programs.
- Multilateral forums, including the Global Cooperation and Training Framework (GCTF), should be leveraged to harmonize operational standards and conduct joint drone training exercises.

Recommendation 2: Strengthen Financial Commitments and Address U.S. Concerns Over Taiwan's Defense Budget Resolve

- The Taiwanese government should increase budgetary allocations to foster the development of a China-free UAV supply chain, while securing bipartisan political consensus to ensure uninterrupted funding.
- Procurement policies must encourage public-sector agencies to prioritize competitively priced domestic UAVs alongside approved non-PRC alternatives, thereby stimulating local industry growth.
- The United States should formally recognize UAV investment as a cornerstone of Taiwan's defense resilience during bilateral defense budget deliberations.

Recommendation 3: Facilitate Taiwanese Access to U.S. Federal Procurement Channels and Local Government Markets

- Taiwan's UAV exporters should deepen engagement with U.S. municipal and state agencies, promoting adoption of Taiwanese drones in public safety and emergency management operations.
- Bilateral cooperation should focus on supporting Taiwanese manufacturers' compliance with Blue and Green UAS certification

requirements, thereby enabling participation in U.S. federal procurement programs.

Recommendation 4: Expand Bilateral Industrial Cooperation to Catalyze UAV Production and Export Capacity

- Existing partnerships, exemplified by firms such as Coretronic and Teledyne FLIR, should be leveraged to develop joint manufacturing ventures and original design manufacturing (ODM) collaborations to scale output and penetrate new markets.

Recommendation 5: Advocate for Exemption of Taiwanese UAVs and Components from U.S. Tariffs

- The United States should exempt Taiwanese drones and critical components from tariff impositions to preserve the integrity of bilateral supply chains and support the nascent domestic UAV sector.

Recommendation 6: Strengthen U.S.–Taiwan Export Compliance Coordination and End-User Verification for European Markets

- Establish a shared, validated registry of authorized buyers to mitigate risks related to unverified intermediaries and facilitate expedited export processes.
- Joint training and information-sharing initiatives should be implemented to enhance Taiwanese manufacturers' capacity to navigate complex export control regimes and fulfill Know Your Customer (KYC) obligations.

Recommendation 7: Rationalize and Target Subsidy Programs to Foster Integrated Circuit Development for Dual-Use UAV and Robotics Applications

- The Taiwanese government should strategically coordinate subsidy schemes under the "Three Chips and Two Software" initiative, prioritizing market-driven R&D investments in interchangeable ICs that serve both UAV and robotics sectors.

Recommendation 8: Collaborate with the United States to Address Strategic UAV Supply Chain Vulnerabilities

- Both governments should conduct a joint assessment of supply chain bottlenecks involving rare earth elements, battery components, and thermal imaging technologies subject to U.S. export controls, with the

objective of diversifying sources and securing critical inputs.

Recommendation 9: Promote Efficient UAV Industrial Clustering While Retaining Distributed Production for National Security Resilience

- The Taiwanese government should incentivize UAV industry consolidation within designated industrial parks through fiscal measures, regulatory facilitation, and land-use planning, enhancing vertical integration and operational efficiencies.
- Concurrently, decentralization must be maintained to ensure resilience against potential wartime targeting of concentrated industrial assets.

Recommendation 10: Establish Domestic Third-Party Certification Infrastructure and Expand Cybersecurity Capacity Building

- Taiwan should develop accredited domestic assessment centers to support Blue and Green UAS certification compliance, aligning with the U.S. Department of Defense's planned authorization of third-party evaluators commencing mid-2025.
- Cybersecurity subsidies must be expanded to enhance the industry's capacity to meet stringent certification requirements and to bolster defenses against escalating cyber threats from state-sponsored actors.

Beyond Subsystems: Advancing U.S.–Taiwan Cooperation on Military-Grade UAV Platforms

In addition to its focus on commercial and dual-use UAV development, Taiwan is seeking to deepen cooperation with the United States on **military-grade platforms already procured,** including the MQ-9B, ALTIUS, and Switchblade systems. To move beyond subsystem integration and address Taiwan's limited role in final assembly, certification, and sustainment, the following recommendations aim to strengthen institutional structures, legal recognition, and industrial interoperability.

Recommendation 11: Designate Taiwan as a Regional Hub for Final Assembly and Sustainment

- The United States should formally designate Taiwan as a regional hub for final assembly, configuration, and long-term sustainment of select U.S. drone platforms. This would enhance forward-operational readiness in the Indo-Pacific and leverage Taiwan's manufacturing strengths to enable regional customization, surge production, and lifecycle

maintenance—addressing key gaps identified in current cooperation.

Recommendation 12: Implement Joint Certification and Expedited Export Mechanisms

- Taiwan and the United States should develop a **joint certification framework and expedited export pathway** for Taiwanese-manufactured UAV subsystems that meet Blue UAS or equivalent democratic standards. This would reduce regulatory misalignment, accelerate subsystem integration into allied platforms, and position Taiwan as a trusted supplier in the democratic drone network.

Recommendation 13: Institutionalize TEDIBOA as a Multilateral Coordination Platform

- Due to Taiwan's unique international status, the United States and Taiwan **do not maintain formal government-to-government defense-industrial cooperation mechanisms**, unlike U.S. arrangements with allies such as Japan or South Korea. As a result, there is currently **no clear Taiwanese counterpart** for engaging with U.S. agencies on issues like joint certification, export coordination, or platform integration for UAV systems.
- To address this gap, the Taiwanese government should **formally designate the Taiwan Excellence Drone Industry and Business Alliance (TEDIBOA) as the primary coordination entity** for international drone cooperation. TEDIBOA can serve as the institutional interface for working with the U.S. Department of Defense, State Department, and allied governments on issues such as subsystem certification, export pipeline management, and industrial alignment—similar in function to an industry consortium but with formal government backing.
- Institutionalizing TEDIBOA would give the United States and its partners a **stable and reliable channel for structured engagement** with Taiwan's UAV sector, enabling smoother trilateral cooperation, deconflicted export timelines, and greater transparency in joint development planning. It would also empower Taiwan's private-sector drone firms to participate in multilateral frameworks from which they are otherwise excluded due to diplomatic constraints.

Recommendation 14: Codify Taiwan's Role within the Democratic Drone Supply Chain under U.S. Law

For the United States:

- Encourage the U.S. Congress to include language in the National Defense Authorization Act (NDAA) or related legislation that **directs the Department of Defense and relevant agencies to assess the feasibility, benefits, and risks of expanding Taiwan's role** in the democratic drone supply chain.
- Such a report should evaluate potential pathways for trusted subsystem integration, final assembly authorization, and long-term sustainment partnerships, with consideration for Taiwan's unique status and strategic relevance in Indo-Pacific defense planning.

For Taiwan:

- Use the scenario framework presented in Chapter 3 to align domestic investment, procurement, and R&D planning with potential outcomes of U.S. policy review.
- Prepare internal capacity-building and standards compliance structures that position Taiwan to respond quickly if opportunities for deeper cooperation emerge.

Introduction

Drones for Democracy: The Strategic Imperative for U.S.–Taiwan UAV Cooperation

The rapid evolution of Taiwan's uncrewed aerial vehicle (UAV) industry reflects the country's strategic imperative to strengthen self-reliant defense capabilities amid an increasingly complex regional security environment. Since the outbreak of the war in Ukraine in 2022, Taiwan's UAV policy has undergone a significant transformation, shifting from a primarily national capability-building initiative under President Tsai Ing-wen's administration to a more expansive, regionally focused vision under President Lai Ching-te. This new approach aims to position Taiwan as a key UAV manufacturing hub in the Asia-Pacific region — a "China-free," dual-use drone supply chain center capable of serving both commercial and defense needs, while reinforcing democratic alliances.

Central to Taiwan's UAV strategy is a three-pronged objective set forth by the Lai administration in 2025: fostering industrial development, enhancing defense self-reliance, and deepening integration into democratic supply chains.

This ecosystem is intended to support national security contingencies amid escalating cross-strait tensions——As one senior Taiwanese national security official involved in UAV affairs interviewed by DSET remarked: *"Unlike Ukraine, in the event of contingencies in the Taiwan Strait, we cannot continue to rely on foreign UAVs or imported drone components. Taiwan must establish a fully self-reliant UAV supply chain—**starting now.**"*

Taiwan's UAV Industry Growth and Remaining Challenges

The Ministry of National Defense (MND) has allocated substantial resources toward UAV development and procurement. Its landmark 2024 tender for 3,422 commercial-grade drones valued at NT$6.8 billion (US$210 million) represents the largest government procurement to date, with deliveries scheduled through 2028. In early 2025, the government further unveiled a cross-agency procurement plan targeting 47,000 UAV units over three years. These initiatives signal Taiwan's ambition to scale UAV production capacity to 180,000 units annually and increase industry value to US$1.24 billion by 2030.

Despite the sector's rapid expansion—marked by nearly doubling in industry value from NT$2.8 billion (US$87 million) in 2023 to NT$5 billion (US$155 million) in 2024, and a tenfold surge in exports—critical structural challenges persist. Production levels, though increasing, remain well below the government's ambitious 2028 target. High manufacturing costs driven by reliance on non-China components, limited domestic procurement beyond the MND's landmark 2024 order, and a scarcity of foreign government

contracts impede further scaling. Taiwan's UAV ecosystem also suffers from technological dependencies on allied imports for core components, notably the so-called "Three Chips, Two Softwares," which the government is subsidizing through targeted R&D efforts. Supply chain bottlenecks involving Chinese-sourced raw materials and stringent U.S. export controls on military-grade technology further constrain the industry's global competitiveness.

Overcoming Challenges: U.S.-Taiwan Cooperation as a Strategic Imperative

The convergence of U.S. defense innovation with Taiwan's advanced manufacturing capabilities presents a timely opportunity to construct a China-free UAV ecosystem. As the American Institute in Taiwan (AIT, the de facto US embassy in Taiwan) Chairman Raymond Greene has emphasized, this is not just a matter of arms transfers—it is an industrial and strategic partnership aligned around shared values and common threats.

U.S. policy measures to reduce reliance on Chinese UAV components have intensified.The FY2020 and FY2025 National Defense Authorization Acts (NDAAs), Executive Order 13981, and the Countering Chinese Communist Party (CCP) Drones Act all reinforce supply chain security mandates. These include bans on DJI, reviews of other China-based manufacturers, and efforts to certify compliant suppliers via initiatives like Blue UAS.

Taiwan has implemented its own "China-free" standard for military procurement and tight regulations for public-sector drone acquisition. Agencies such as the Ministry of Digital Affairs (MODA) and the National Communications Commission (NCC) enforce rigorous sourcing, cybersecurity, and performance standards for all UAV platforms to support Taiwan's contribution to a **China-free, certified drone supply chain aligned with democratic standards.**

Together, these parallel efforts reflect a broader shared objective: the establishment of a democratic, secure, and interoperable drone supply chain. As China endeavors to dominate UAV markets and set global standards, Taiwan and the U.S. are positioned to lead by example.

Constraints in U.S.-Taiwan Cooperation: Limited U.S. Market Access and Early Stage Co-Production

Since the inaugural U.S. Drone Business Development Mission to Taiwan in September 2024, organized jointly by the U.S. Department of Commerce and AIT, bilateral cooperation discussions have intensified. However, Taiwan's UAV exports to the U.S. market remain limited, with government procurement largely confined to state-level contracts. No Taiwanese UAV manufacturers have secured federal contracts or appear on the U.S. Department of Defense's Blue UAS or the industry-led Green UAS certification lists, constituting a major barrier to broader market penetration.

U.S.-Taiwan UAV collaboration remains embryonic, predominantly at the subsystem integration level. This contrasts with Taiwan's more advanced defense cooperation with the U.S., such as in localized F-16 maintenance. While Taiwan supplies critical modules, it lacks formal arrangements for co-production, final assembly, co-design, or long-term sustainment of U.S.-origin UAV platforms like the MQ-9B or ALTIUS. Unlike South Korea and Japan, which benefit from joint development programs and local assembly facilities, Taiwan remains excluded from these strategic partnerships, constraining its operational autonomy and industrial expansion.

These limitations underscore five principal challenges: absence of final assembly and sustainment rights, lack of co-design mechanisms, limited certification and market access, fragmented interagency coordination, and the lack of formal legal or institutional recognition of Taiwan as a strategic industrial partner under U.S. law. Failure to address these issues risks Taiwan falling behind in defense-industrial innovation, undermining its long-term drone self-reliance.

Scope of the Report

This report provides a forward-looking strategy for U.S.–Taiwan UAV cooperation.

Chapter 1 analyzes the strategic framework for U.S.-Taiwan UAV collaboration based on official documents and policy plans.

Chapter 2 reviews Taiwan's UAV policy transformation and industrial planning, assessing the government's "Three Objectives, Five Strategies" framework, progress achieved, outstanding challenges, and corresponding recommendations. These strategies include: market expansion, technology development, industrial cluster formation, regulatory and cybersecurity alignment, and defense resilience.

Chapter 3 explores strategic uncertainty in bilateral coordination amid shifting U.S. policies. It applies a three-scenario framework to elucidate strategic options Taiwan must consider to embed itself within the democratic drone supply chain: Incremental Integration, Institutionalized Partnership, and Fallback Autonomy.

The recommendations for each chapter are consolidated at the beginning of this report.

Methodology

The sources for this report include U.S. and Taiwanese government UAV-related documents, official Taiwanese government import-export data, and extensive interviews conducted by DSET from October 2023 to May 2025 with key stakeholders in Taiwan's UAV ecosystem. Interviewees included (1) former and current senior Taiwanese government officials involved in UAV policy; (2) seven leading domestic UAV manufacturers, including commercial drone companies contracted by the Ministry of National Defense (MND); (3) academic researchers engaged in discussions on government R&D planning; and (4) representatives from Taiwanese and U.S. business associations involved in facilitating Taiwan's international UAV cooperation. Given the sensitivity of the subject matter, all interviews were conducted anonymously. Throughout this report, insights from these sources are referenced under the categories "government stakeholders," "leading drone manufacturers," and "academic experts."

DSET expresses its sincere gratitude to all interviewees for their valuable assistance throughout the research process. The conclusions and recommendations presented in this report are solely those of DSET and do not represent the views of the interviewees or any government entity.

Chapter 1

Strategic Roles of UAVs in a Taiwan Contingency:

Doctrinal Integration, Allied Concepts, and Operational Gaps

Executive Summary

The integration of UAVs in Ukraine's defensive operations against Russian forces has catalyzed a fundamental transformation in Taiwan's military doctrine concerning drone warfare. Although Taiwan has maintained a self-reliant UAV development program through the National Chung-Shan Institute of Science and Technology (NCSIST) since the 1980s, the administration under President Tsai Ing-wen **initiated a sweeping effort to elevate UAVs as a core element of national defense—culminating in the 2022 launch of the "Drone National Team."** This strategic evolution encompasses two critical dimensions: (1) the systematic integration of military drone operations across multiple domains and operational levels, and (2) the development of extensive public-private partnerships t**o scale production and enable a resilient, China-free UAV supply chain.** Specifically, the administration's strategic framework prioritizes robust domestic production capabilities, **enhanced operational flexibility**, and **industrial resilience**—elements that have been empirically validated through Ukraine's successful deployment of diverse drone platforms for both intelligence, surveillance, and reconnaissance (ISR) and combat operations.

This chapter conducts a comprehensive analysis of Taiwan's evolving UAV strategy through four interconnected dimensions:

First, it provides a detailed assessment of Taiwan's current UAV capabilities, encompassing both self-reliantly manufactured systems and platforms acquired through U.S. arms sales and military assistance. This analysis extends to an examination of Taiwan's military command structure's strategic vision for deploying these assets across different phases of potential cross-strait conflict scenarios, **including force protection, littoral dominance, and beachhead neutralization.**

Second, it presents an examination of the U.S. strategic perspective and associated initiatives regarding drone warfare in a Taiwan contingency, including analysis of current policy frameworks, **emerging operational concepts such as "Hellscape," the Replicator initiative**, technological transfer protocols, and joint operational doctrines.

Third, it evaluates the multifaceted nature of the U.S.-Taiwan UAV

cooperation, analyzing various levels of existing support mechanisms while exploring potential opportunities for Taiwan's **institutional integration into a democratic UAV ecosystem beyond platform sales.**

Fourth, it identifies key challenges in implementing both U.S. and Taiwan's drone strategies, focusing on three crucial areas: strategic alignment disparities between the two nations, **procurement delays and uneven operational integration**, and structural limitations in manufacturing capacity and supply chain resilience—**particularly persistent dependence on Chinese components.**

1.1 Taiwan's UAV Doctrine and Strategic Vision

Taiwan's early investment in UAVs began as early as the 2000s as part of its efforts to modernize its military and strengthen its surveillance capabilities amid growing tensions with China. These initial steps were primarily driven by the Ministry of National Defense (MND), working in collaboration with state-affiliated defense organizations such as the NCSIST. Though limited in range and functionality compared to modern systems, these early investments laid the groundwork for subsequent advancements in UAV technology. Since then, drones have been gradually incorporated into Taiwan's defense strategy. This section examines how Taiwan seeks to employ UAVs within its defense strategy, as well as its plans to procure and acquire them.

1.1.1 Operational Concepts: UAV Roles Across Taiwan's Defense Phases

MND has released limited public information regarding the role of UAVs within its broader defense strategy. However, the National Defense Report (NDR), Quadrennial Defense Review (QDR), and legislative briefings provide valuable insights into how UAVs might be employed in a conflict scenario. Additional analysis from the Institute for National Defense and Security Research (INDSR), a think

tank affiliated with the MND, sheds light on Taiwan's strategic priorities.

According to Taiwan's latest NDR and QDR, UAVs and counter-UAV systems will be used to support a layered defense-in-depth as part of the overall strategic doctrine. Regarding force buildup, Taiwan will acquire UAVs to assist all three branches of the armed forces, as well as the coast guard. Domestic UAV systems will include the Chien Hsiang anti-radiation UAVs (劍翔反輻射無人機) , Teng Yun UAVs (騰雲無人機), and counter-UAV systems that will assist with its Command and Control (C2) capabilities, and Intelligence, Surveillance, and Reconnaissance (ISR) missions. On the other hand, Taiwan will continue to acquire US-made UAVs like the MQ-9B and to further strengthen the scope of its ISR and early warning capabilities.

Other public sources provide more detail on Taiwan's vision for UAV employment. In a March 2024 report to the Legislative Yuan, the nation's unicameral legislature, MND outlined the integration of UAVs across joint, tactical, and combat levels of operations.
At the joint theater level, long-range UAVs (Group 4+, 150 km and above) would enhance ISR capabilities for both the Air Force and Navy, increasing situational awareness and early warning capabilities.

At the operational level, short-range UAVs (Group 3, 20–100 km) would monitor enemy landing forces, while medium-range UAVs (Group 3, 100–150 km) would survey and identify targets, enabling precision strikes with systems such as anti-ship missiles.

At the tactical level, close-range UAVs (Group 1-2, 20 km and below) would operate alongside ground units to conduct real-time reconnaissance and support small-unit surveillance missions, reducing risks to personnel while enhancing operational effectiveness. Specifically, small close-range attack UAVs (Group 2, 5-20 km) would be used to provide real-time strike capability by detecting and engaging enemy ground targets, while very close-range UAVs (Group 1, 5 km and below) would be employed for reconnaissance missions in small units to provide troops with imagery and intelligence.

MND's evolving doctrine distinguishes UAV missions by size and operational level. In a recent briefing to the Legislative Yuan, MND outlined a dual-role approach that assigns each UAV platform to either ISR or attack missions—based on its size and functional capabilities.

ISR UAVs (監偵型無人機) are designed to enhance situational awareness and provide real-time intelligence across different operational levels. Larger ISR UAVs (Group 4-5) conduct long-range reconnaissance to support early warning and joint operational planning, while medium and small ISR UAVs

(Group 1-3) perform reconnaissance to supply precise targeting data. Attack UAVs (攻擊型無人機), equipped with advanced sensors and munitions, are tasked with targeting adversaries autonomously. Small attack UAVs (Group 1) are optimized for navigating complex terrain and are capable of strikes against personnel, vehicles, and high-value targets. Medium attack drones (Group 2-3), including anti-armor platforms, extend the reach of anti-armor capabilities which increases operational flexibility while reducing risks to personnel and equipment.

Table 2
UAV Type and Mission According to Public Sources

Classified by level of operation	Joint theater	Group 4+ (150 km+): Long-range ISR for situational awareness and early warning.
	Operational	Group 3 (20–100 km): Monitor enemy landings and relay info to command.
		Group 3 (100–150 km): Identify targets for precision strikes.
	Tactical	Group 1 (≤5 km): Recon or close-range strikes.
		Group 2 (5–20 km): Strike ground targets in real time.
Classification by mission type	ISR	Group 1-3: Targeting support for weapon systems.
		Group 4+: Long-range recon for early warning and planning.
	Attack	Group 1: Designed for striking high-value targets in complex terrain.
		Group 2-3: Extend anti-armor reach, improve flexibility, reduce risk to personnel.

Discussions have also explored the expansion of the role of UAVs in peacetime. In March 2024, following the capsizing of a Chinese fishing vessel near Kinmen, Taiwanese legislators proposed establishing drone units on its outlying islands of Kinmen and Matsu to support rescue operations. Such developments suggest the potential for UAVs to play an increasingly prominent role in disaster relief and humanitarian efforts in the future.

While reports from MND primarily focus on the missions associated with different UAV classifications, the INDSR provides additional perspectives on their use within Taiwan's defense strategy. Specifically, it details how Taiwan might integrate UAVs across three stages of its concept of operations: the force protection phase (戰力防護), the littoral dominance phase (濱海決勝), and the beachhead neutralization phase (灘岸殲敵).

The purpose of the force protection phase is to preserve Taiwan's operational resilience at the outset of conflict, during which the island's C2 systems are under threat from a barrage of firepower from the air. To ensure the operational capability of UAVs, INDSR suggests using tactical, anti-radiation, and transport UAVs, which are easier to maintain and repair. This includes the Teng Yun system for surveillance and the Chien Hsiang drone for anti-radiation missions. The MND has also highlighted plans to integrate domestically developed UAVs, particularly those produced by the NCSIST, to ensure critical capabilities remain intact under threat .

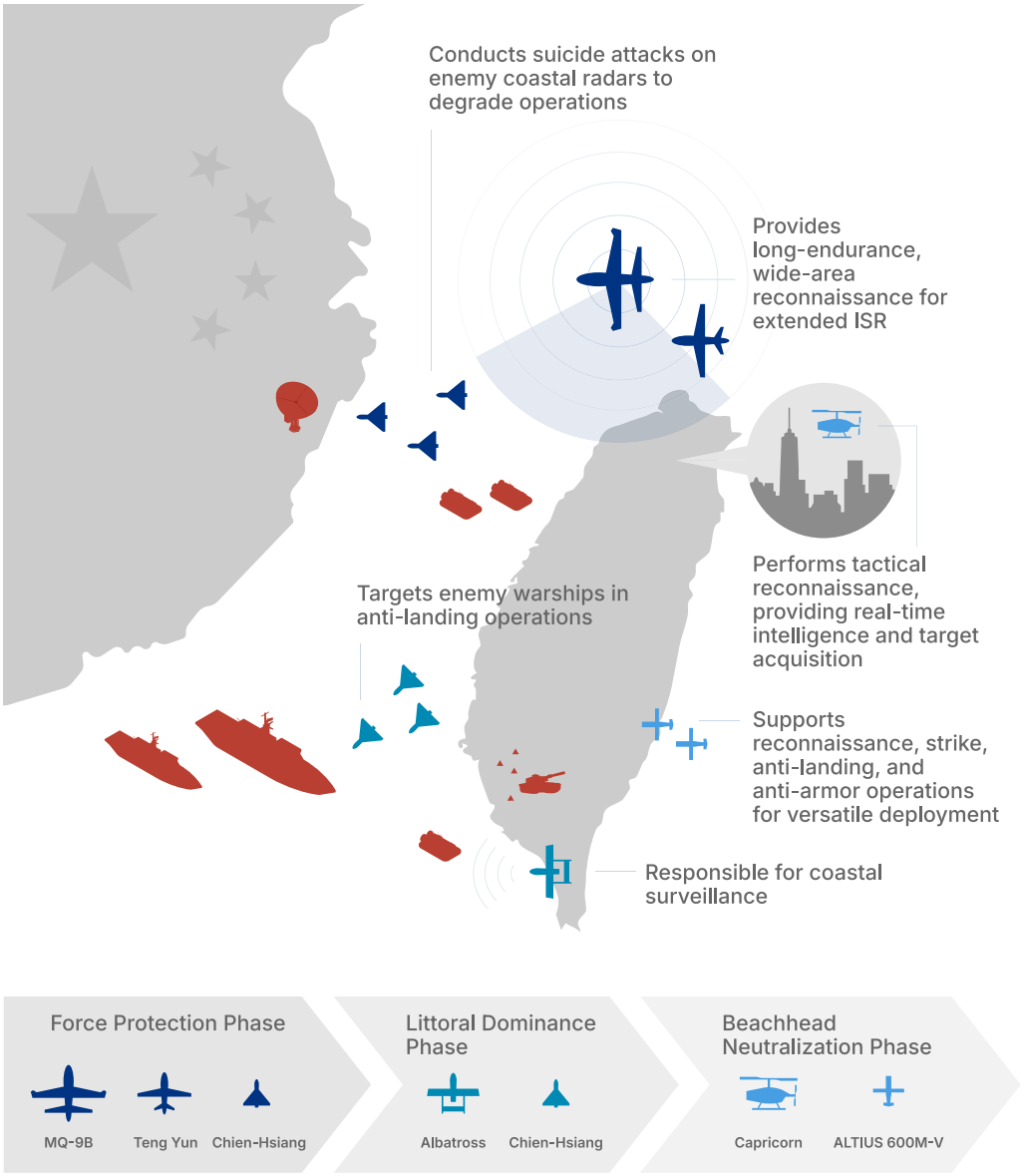
During the littoral dominance phase, Taiwan will seek to prevent the landing of enemy forces. INDSR emphasizes the deployment of UAVs for precision operations to disrupt adversarial forces. This includes stealthy long-range attack drones, large kamikaze UAVs, anti-radiation systems, and uncrewed aerial refueling platforms. Concurrently, the MND has also expressed intentions to strengthen Taiwan's defense posture by enhancing its UAV capabilities through domestic innovation and selective procurements to ensure effective operations in the country's coastal regions.

Finally, the INDSR recommends the use of short-range reconnaissance drones, small kamikaze UAVs, and decoy systems during the beachhead neutralization phase, which is the last operational phase that seeks to counter amphibious landing attempts. These recommendations align with MND's recognition of the strategic value of smaller tactical drones and decoy platforms in supporting operations designed at neutralizing potential amphibious threats.

Although the specifics of UAV integration into Taiwan's defense strategy remain classified, the convergence between INDSR's assessments and the MND's broader

strategic direction offers valuable insights into the role UAVs could play. These platforms are poised to make a significant, or even decisive contribution to strengthening Taiwan's defense capabilities, ensuring that the country is better equipped to address evolving security challenges.

Figure 3
UAV in Taiwan's Overall Defense Concept (ODC)



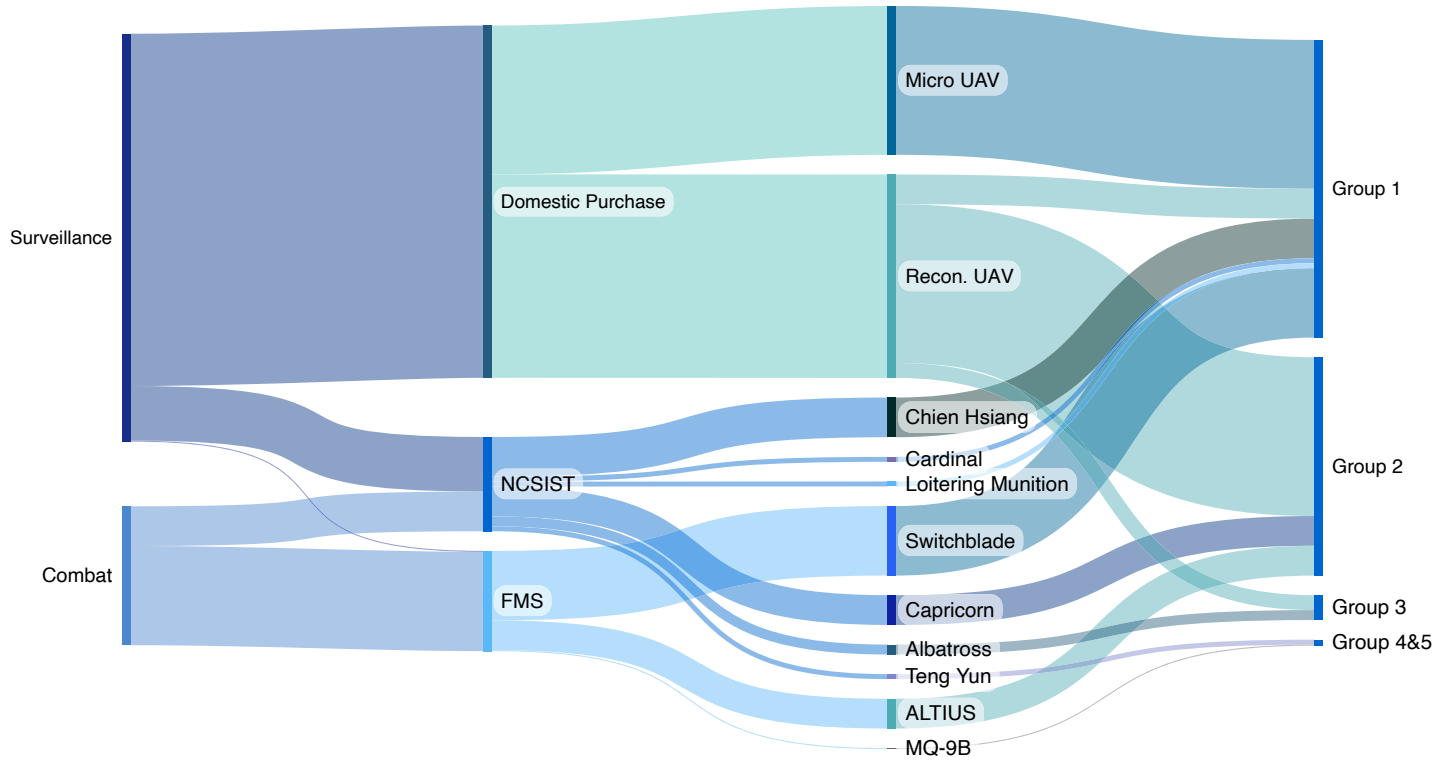
1.1.2 Building Domestic Capacity: Procurement, Production, and Public–Private Models

A cornerstone of Taiwan's defense strategy is its commitment to developing "self-reliant defense capability" (國防自主). At present, it has established three methods of acquiring drones: production of military-grade drones through the state-owned NCSIST, public-private partnerships to produce commercial drones for military use (i.e., commercial-grade military drones), and purchases from the U.S..

One of Taiwan's central efforts on UAVs has centered on expanding domestic production by leveraging public-private partnerships for technology and manufacturing. According to the latest Taiwan NDR, Taiwan plans to manufacture over 700 military-grade and over 3,000 dual-use commercial-grade UAVs by 2028. The government-established TEDIBOA has revealed a national objective to attain a monthly production capacity of 15,000 drones by 2028, driving the total industry output value to NT$30 billion.

According to Yang Chih-ching, Deputy Director-General of Industrial Development Administration (IDA)

Figure 4: Taiwan's UAV Fleet: Acquisition & Classification Overview



at the Ministry of Economic Affairs (MOEA), Taiwan's military-grade drones, such as its large attack UAVs, will be developed and manufactured domestically by NCSIST. Meanwhile, the MOEA has been tasked to select contractors from the domestic UAV industry to manufacture dual-use commercial-grade drones for deployment by the Armed Forces and Coast Guard Administration. As an initial demonstration of this initiative, the MND has commissioned the production of 3,422 dual-use drones under a contract valued at NT$6.8 billion (US$212.5 million). Figure 2 offers an overview of Taiwan's existing and developing UAVs, detailing their acquisition methods, production stages, and classification types based on the U.S.' UAS system.

To facilitate these production goals, the MND has hinted at the construction of a dedicated "Aerospace and Drone Industrial Park" in Chiayi County for the cultivation of a drone production ecosystem. It focuses on improving AI capabilities and aims to create a self-reliant defense industrial base for Taiwan.

Taiwan has also pursued the acquisition of UAVs by sourcing them from the U.S.. The following section will explore in greater detail how US arms sales support Taiwan's UAV objectives.

1.2 U.S. Strategy for a Taiwan Contingency: Uncrewed Systems and Deterrence Concepts

The U.S. has a long history with UAVs, dating back to 1917. These uncrewed systems have played critical roles in conflicts such as the Vietnam War and the Persian Gulf War and have been the subject of continuous investment, albeit often with less focus compared to larger, more traditional military platforms.

The U.S. has also shown increasing support for Taiwan's acquisition of UAVs, a trend which began prior to the Russian invasion of Ukraine. It additionally endorses Taiwan's acquisition and development of UAVs across multiple levels: legislation in Congress, integration of UAVs in its Indo-Pacific strategy, arms sales of advanced UAV systems, and the potential for future coproduction partnerships with Taiwan. The rest of this section will examine these different levels of support in greater detail.

1.2.1 Congressional and Policy Support for UAV Integration

The U.S. supports Taiwan's acquisition of UAVs as part of its broader encouragement for the nations to adopt an Overall Defense Concept (ODC) strategy. This strategy focuses on incorporating lethal, mobile, numerous, and cost-effective systems alongside existing platforms to enhance area denial and access denial (A2AD) capabilities. The NDAA 2023, for instance, explicitly states that it is the sense of Congress to support "acquisition by Taiwan of defense articles and services through foreign military sales, direct commercial sales, and industrial cooperation, with an emphasis on capabilities that support an ODC strategy.

The Taiwan Enhanced Resilience Act (TERA), enacted as part of the NDAA 2023, is an example of Congress's initiative to move Taiwan's acquisition of UAVs. Aiming to modernize Taiwan's defense capabilities and strengthen U.S.-Taiwan defense partnership, the TERA mandates certification that any appropriations authorized for Taiwan's Foreign Military Finance (FMF) are contingent upon Taiwan increasing its defense spending and pursuing its ODC strategy. To verify the nation's commitment to these objectives, the TERA also requires an "annual report on advancing the defense of Taiwan," which includes an evaluation of Taiwan's efforts to "acquire and employ within its forces counterintervention capabilities" such as "manned and uncrewed aerial systems."

Policy documents also highlight U.S. lawmakers; support for American forces to employ UAVs in a potential cross-Strait conflict. In May 2023, the House Select Committee on the Chinese Communist Party released its "Ten for Taiwan" report, outlining policy recommendations for the U.S. government to maintain peace and stability in the Taiwan Strait. The first recommendation urges the U.S. to bolster its capabilities by acquiring "additional long-range missiles and uncrewed vehicles in the Indo-Pacific region." It further calls on Congress "increase funding for sonobuoys and other anti-submarine warfare capabilities and for autonomous undersea and uncrewed aerial vehicles for purposes of intelligence, surveillance, and reconnaissance and to increase the number and diversity of strike platforms." The report underscores the complexity of the threat environment in the Indo-Pacific and the necessity of deploying diverse uncrewed systems across multiple operational domains.

Table 3
US Defense Initiatives Enhancing Security and Uncrewed Systems Capabilities

Initiatives	Year	Agency	Description
Blue UAS	2020	DoD / DIU	Fast-tracks trusted commercial UAS tech for defense use.
Replicator 1 & 2	2023 &2024	DoD / DIU	Replicator 1: Mass production of drones. Replicator 2: Fixes production, policy, and integration gaps.
Taiwan Enhanced Resilience Act (TERA)	2022	Congress	Requires report on U.S.–Taiwan defense ties, including uncrewed systems.
Ten for Taiwan Report	2023	House Select Committee on CCP	Calls for more U.S. uncrewed systems in Indo-Pacific and faster production.
NDAA of FY2024-2025	2023 &2024	Congress	Supports DIU, DIB, R&D, and T&E for uncrewed and allied defense systems.

1.2.2 Operational Planning and U.S. Theater Concepts: Hellscape and Replicator

At the operational level, the U.S. Indo-Pacific Command (INDOPACOM) has envisioned "Hellscape" as a potential strategy for leveraging uncrewed systems in the Taiwan Strait. The term was originally coined by Admiral John Aquilino, former commander of INDOPACOM, in August 2023. It was brought up again at the 2024 Shangri-La Dialogue by the current commander, Admiral Samuel Paparo. The concept envisions deploying thousands of uncrewed systems of every domain to "swarm" and overwhelm China's invasion forces and give Taiwan and the U.S. time to respond. This "swarm" would include uncrewed submarines, drones, and surface ships, all of which offer rapid deployment capabilities and enhanced operational mobility.

"I want to turn the Taiwan Strait into an uncrewed hellscape using a number of classified capabilities, so that I can make their [China's] lives utterly miserable for a month, which buys me the time for the rest of everything," Paparo remarked in an interview for *The Washington Post*.

The concept of swarming is not new, and the U.S. recognizes its own vulnerability to such tactics by adversaries. Section 162 of the NDAA 2023, for example, mandates an "assessment and strategy for fielding capabilities to counter threats posed by uncrewed aerial system swarms" from countries like China, Russia, Iran, and North Korea. Swarming is a recognized threat in modern warfare.

Interestingly, the Hellscape plan mirrors the U.S.' own strategy of implementing swarming tactics in the Indo-Pacific. By deploying large numbers of uncrewed systems to swarm Chinese forces, the U.S. would buy time for conventional forces to move across the Pacific while minimizing losses to larger, more expensive platforms. Since China's strategy relies on a swift invasion to achieve *a fait accompli*, Hellscape would thwart any easy takeover of Taiwan.

While the specifics of Hellscape remain classified, the U.S. has already begun investing in capabilities that would facilitate swarming tactics. First proposed in August 2023, the Pentagon's Replicator Initiative seeks to "deploy uncrewed systems en masse, allowing the U.S. military to disperse combat power over a large number of relatively inexpensive systems." According to a report by the U.S. Naval Institute, the goal is to field All-Domain, Attritable Autonomous (ADA2) systems and thousands of uncrewed systems by August 2025. In May 2024, Deputy Secretary of Defense Kathleen Hicks announced that the U.S. Department of Defense (DoD) had secured $1 billion for the first tranche of Replicator, which would include Uncrewed Surface Vehicles (USVs), Uncrewed Aerial Systems (UAS), and

Counter-Uncrewed Aerial Systems (C-UAS) from different vendors.

Replicator aligns with the ODC concept described in Hellscape. U.S. Naval Institute (USNI) News explicitly noted that the first tranche of the initiative, Replicator 1, is designed to impede or thwart an amphibious invasion of Taiwan by deploying a swarm of lethal drones against the invading forces. The initiative is led by the Defense Innovation Unit (DIU), a DoD organization that seeks to adopt commercial technology for military usage at commercial speeds.

Despite recent efforts such as the Replicator initiative to scale autonomous systems rapidly, some defense policy analysts contend that current U.S. investments remain misaligned with the operational demands of a Taiwan contingency. Specifically, they argue that the DoD continues to emphasize short-range systems—like AeroVironment's Switchblade 600, one of the few unclassified systems linked to Replicator's first tranche—rather than developing cost-effective, long-range strike and surveillance drones needed for operations across vast Indo-Pacific distances. This mismatch risks undermining deterrence in the near term. Still, much of the Pentagon's drone development remains confidential, and there are encouraging prospects for Taiwan-U.S. collaboration in manufacturing and procurement to enhance preparedness for potential scenarios in the Taiwan Strait region.

1.2.3 Arms Transfers and Delivery Gaps: U.S. UAV Sales to Taiwan

On June 18, 2024, U.S. Defense Security Cooperation Agency (DSCA) notified Congress of the possible sale of ALTIUS 600M-V UAVs and the Switchblade 300 Anti-Personnel and Anti-Armor Loitering Missile System per the request of the Taipei Economic and Cultural Representative Office (TECRO, the de facto Taiwan embassy in the U.S.). The respective principal contractors for these systems are Anduril and AeroVironment, defense companies specializing in UAVs and uncrewed systems. Indeed, though the war in Ukraine has underscored the strategic importance of UAVs, U.S. support for Taiwan's UAV capabilities is driven by specific geostrategic considerations unique to Taiwan.

Despite staunch U.S. support for Taiwan's acquisition of systems like UAVs, the arms sales process has been plagued by frequent delays. For instance, on November 3, 2020, DSCA notified Congress about the potential sale of four MQ-9B to Taiwan. On May 1, 2023, the DoD initially awarded the contract for the four MQ-9B to General Atomics Aeronautical Systems Inc., but production was postponed. A second renewed contract was

finally awarded to General Atomics on March 12, 2024. The extended timeline and delays may indicate the U.S. government's hesitation in providing Taiwan with advanced UAV technology such as the MQ-9B.

Delays in arms deliveries to Taiwan extend beyond just UAV cases. During a September 2024 congressional hearing on defense cooperation with Taiwan, State Department official Mira Resnick acknowledged the challenge by stating, "We are doing all we can to help ramp up industrial capacity, speed up production, and reduce long lead times." This suggests that the delays in UAV deliveries can be attributed to broader industrial capacity constraints and production limitations, emphasizing the necessity for comprehensive solutions to facilitate Taiwan's defense procurement requirements.

Table 4: From Case Establishment to Delivery: A Timeline of Taiwan's U.S.-Approved Drone Acquisitions

TW administration	US administration	Cost (US$ millions)	System	MND Case Year	Budget Year	US Congress Notified	DoD Contract Award
Tsai Ing-wen	DONALD J. TRUMP	600	4 MQ-9B Remotely Piloted Aircraft	2021[1]	2022-2029	11/3/2020	5/1/2023 & 3/12/2024
Lai Ching-te	JOSEPH R. BIDEN JR	300	291 ALTIUS 600M-V uncrewed Aerial Vehicles	2023[2]	2024-2026	6/18/2024	N/A
Lai Ching-te	JOSEPH R. BIDEN JR	60.2	720 Switchblade 300 Anti-Personnel and Anti-Armor Loitering Missile System	2023[3]	2024-2026	6/18/2024	N/A

[1] Ministry of National Defense, Taiwan. "Proposal of Annual Budget of MND for FY2025: High Altitude UAS." pp. 248-249.

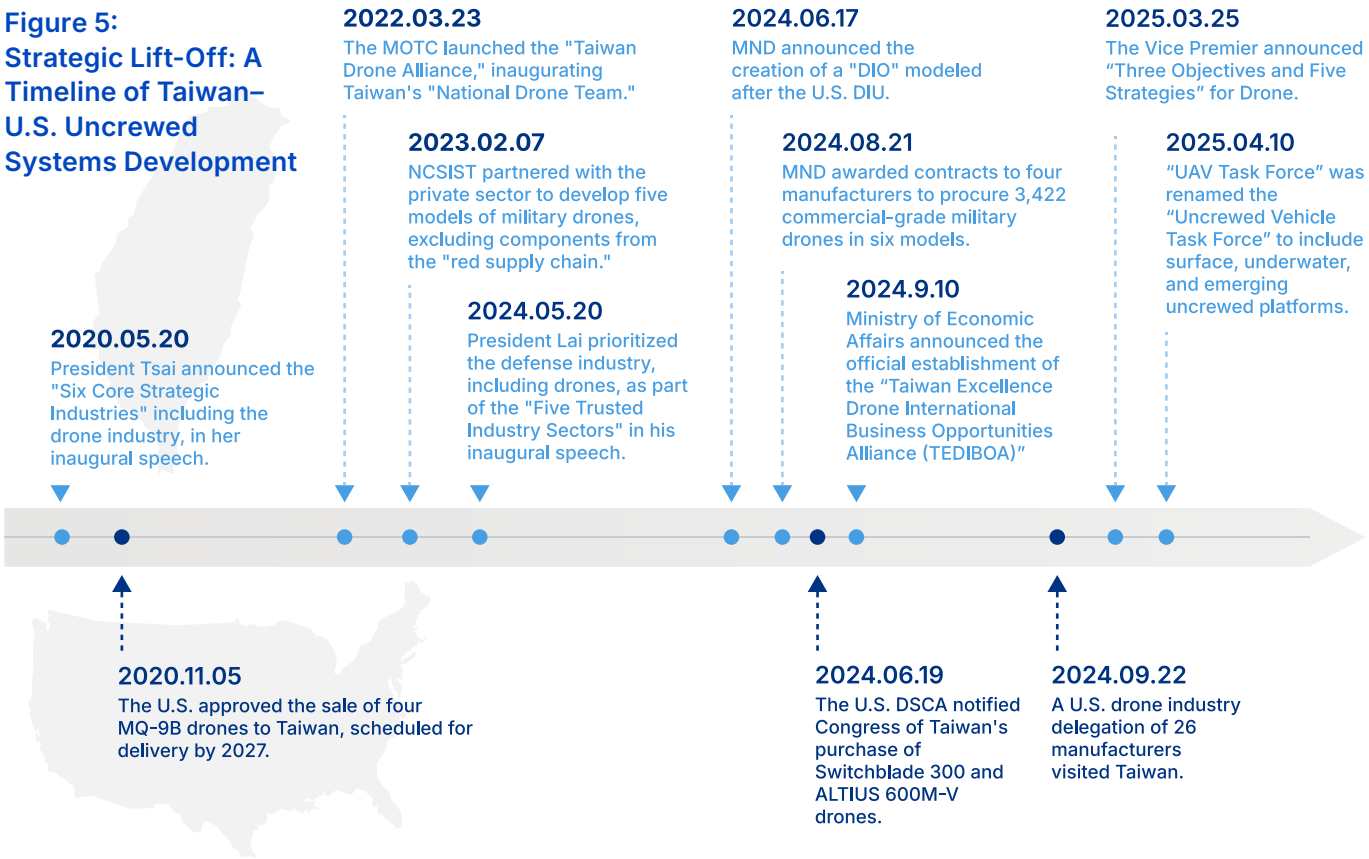
[2] Ministry of National Defense, Taiwan. "Proposal of Annual Budget of MND for FY2025: Attack UAS Missile System." pp. 170-171.

[3] idle

1.2.4 Toward Co-Production: Industrial Collaboration and Supply Chain Realignment

Aside from arms sales to Taiwan, discussions about U.S.-Taiwan cooperation have deepened at the industry level. In late September 2024, the AIT and the U.S. Department of Commerce's (DoC) International Trade Administration (ITA) organized a Drone Business Development Mission to Taiwan, which included the Taiwan UAS and the C-UAS Business Development Mission – drone and anti-drone manufacturers. According to the trade administration, their purpose was to facilitate discussions between American manufacturers and Taiwan's defense industry to "strengthen the Taiwan-U.S. trade relationship, showcase the technology, know-how, and capabilities that U.S. industry has to offer, and demonstrate U.S. interest in partnering with Taiwan to strengthen its self-defense capabilities." The Financial Times reported that the discussions focused on exploring strategies for shifting drone supply chains away from China, which currently holds a dominant position in the global commercial drone market.

Figure 5: Strategic Lift-Off: A Timeline of Taiwan–U.S. Uncrewed Systems Development



1.3 Strategic Convergence: U.S. and Taiwan Drone Doctrine in Parallel

While Taiwan is integrating UAVs across all layers of its defense architecture, the U.S. is simultaneously advancing drone-centric operational concepts tailored for the Indo-Pacific. Programs such as **Replicator, Hellscape**, and evolving JADC2 (Joint All-Domain Command and Control) integration reflect a shift in U.S. strategy toward scalable, attritable, and autonomous systems designed to deny adversary access, extend kill chains, and saturate contested zones with networked ISR and strike assets.

This represents a strategic convergence in how both countries view drones—not merely as tactical enhancers, but as force multipliers for **survivability**, **resilience**, and **operational disruption**. However, key differences exist in their approaches. Taiwan emphasizes **short- and medium-range systems** to support near-term ISR dominance, littoral defense, and beachhead denial under its ODC. By contrast, the U.S. prioritizes **long-range, distributed, and modular platforms** that can operate across archipelagic terrain and forward bases under threat of kinetic and electromagnetic attack.

These doctrinal approaches also carry industrial implications. Taiwan's strength lies in semiconductors, airframes, and tactical subsystems; the U.S., in contrast, is investing in **autonomous swarming software, long-range propulsion**, and **certification mechanisms** like **Blue UAS** to screen suppliers. Initiatives such as Replicator and Hellscape are not just concepts—they are procurement accelerators that require scalable component ecosystems. For Taiwan to participate, it must align with U.S. standards, onboard through approved pathways, and demonstrate subsystem compatibility at scale.

This evolving alignment creates an opportunity—but also a requirement—for **co-development of platforms, shared operational planning, and joint certification pathways**. While Taiwan and the U.S. adopt different operational emphases—short-range, survivable ISR systems versus long-range, distributed autonomy—these approaches are strategically complementary. Taiwan's subsystem manufacturing and near-shore defense focus can reinforce U.S. efforts to deploy scalable, forward-operating drone architectures across the Indo-Pacific. The next chapter explores how Taiwan is translating these concepts into policy—by transforming its procurement models, building out subsystem production, and positioning itself within a China-free UAV supply chain aligned with allied operational needs.

Chapter 2

From Taiwan's "National Drone Team" to an "Asia-Pacific UAV Center"

Progress and Challenges in Building a China-Free "Commercial-grade, Military use" Drone Supply Chain

Executive Summary

1. **Policy Evolution: From "National Drone Team" to "Asia-Pacific Drone Hub":**

   - Taiwan's UAV policy has evolved from a national capability-building initiative under President Tsai Ing-wen (2020–2024) into a broader strategic vision under President Lai Ching-te (2024–), aimed at positioning Taiwan as a regional hub for a China-free, dual-use drone supply chain.

   - To support these ambitions, the Lai administration identifies three objectives for its drone strategies in 2025: (1) promoting industrial development, (2) strengthening defense self-reliance, and (3) deepening integration into democratic supply chains.

2. **MND's Landmark 2024 UAV Tender——3,422 Units, $211M**

   - Taiwan's UAV acquisitions fall into three categories: (1) Attack drones developed domestically by NCSIST; (2) Imported ISR and attack drones from the United States; (3) ISR drones procured from local commercial firms.

   - The 2024 MND procurement, the largest-ever commercial-grade drone tender, is a key industry driver: NT$6.8 billion (US$210 million) for 3,422 ISR drones across Group 1–3 UAVs (by U.S. DoD standards), with deliveries scheduled from 2025 to 2028.

   - Separately, Taiwanese companies are developing FPV loitering munitions, though these systems are not yet included in MND procurement pipelines.

3. **Production and Value Targets — 180K Units/Year by 2028, US$1.24 Billion by 2040**

   - The Lai administration has identified UAVs as a strategic industry, with policy goals that include: (1) Increasing annual production value from NT$5 billion (US$155 million) in 2024 to **NT$40 billion (US$1.24 billion) by 2030** and (2) reaching an annual output of **180,000 UAVs by 2028**.

4. **Committed Procurement: 47,000 UAVs (2025–2028)**

   - In 2025, the government pledged to procure 47,000 UAVs for government agencies—its largest procurement plan to date.

5. **Industrial Growth: Value Doubled, Exports Up Tenfold Since 2023, but Gaps to Targets Remain**

    - Taiwan's UAV sector has experienced rapid growth:

        - The industry value has increased from NT$2.8 billion (US$87 million) in 2023 to NT$5 billion (US$155 million) in 2024

        - Exports grew **tenfold** from 290 units (2023 H2) to 3,473 units (2024), with total export value exceeding **US$2.3 million**; Q1 2025 alone saw 3,426 units exported—nearly matching 2024's full-year total.

        - Estimated **annual production capacity (from April 2024-April 2025)** is between **8,000 and 10,000 units.**

    - However, structural challenges remain, with production still falling well short of the 180,000-unit target.

6. **Export Destination: U.S. Growth Continues, but EU Becomes Primary Destination**

    - The United States was initially Taiwan's sole UAV export market. In the second half of 2023, 278 units were exported to the U.S., valued at US$613,000.

    - While exports to the U.S. continued to grow in 2024 and early 2025, the European Union has since overtaken the U.S. as the leading destination. In 2024, Taiwan exported 874 units to the U.S. (US$823,000) and 1,323 units to the EU (US$1.36 million). By Q1 2025, exports to the U.S. reached 437 units (US$356,000), while exports to the EU surged to 2,982 units (US$1.72 million).

7. **U.S. Market Access Limited to State-Level Procurement**

    Taiwanese UAV exports to the U.S. remain limited, primarily restricted to state-level government procurement.

    - No publicly known Taiwanese UAVs are present in the U.S. commercial market, mainly due to higher prices compared to Chinese competitors.

    - As of May 2025, no Taiwanese UAV manufacturer has secured U.S. federal procurement contracts or been included in the U.S. DoD's Blue

UAS list (used for defense procurement) or the industry-led Green UAS list (used by non-defense federal agencies and local governments).

- The only publicly known export case involves Taiwan-based Coretronics, which has supplied drones to state-level police, firefighting, and public safety departments.

8. **Current U.S.–Taiwan Cooperation: Focus on Subsystem Integration**

   - U.S.–Taiwan UAV cooperation is increasingly centered on subsystem integration. In May 2025, AIT Director Raymond Greene highlighted AI, supply chain integration, and investment as key areas of the U.S.–Taiwan UAV collaboration. Taiwan's Defense Minister also noted joint efforts to build a "non-red" supply chain.

   - According to defense sources, cooperation focuses on integrating mature Taiwanese subsystems into next-generation UAVs through two tracks: embedding cost-effective components into U.S. and allied platforms, and sourcing U.S. subsystems to support Taiwan's R&D and interoperability.

9. **Structural Limitations: Limited Scale, Foreign Technology Reliance, and Supply Chain Bottlenecks.**

   - **Limited Production Scale**

     Production scale remains limited due to high manufacturing costs, low domestic procurement, and minimal foreign government orders.

     - High manufacturing costs: Taiwan relies on non-PRC components, which significantly increases unit prices. For example, SDR video transmission chips imported from allied countries can cost up to 10 times more than DJI's in-house chips.

     - Low domestic procurement: Aside from the Ministry of National Defense's 3,422-unit order, no large-scale government purchases have been implemented. (The new procurement plan for 47,000 units over the next four years has not yet been allocated a budget.)

     - Limited foreign government procurement: Currently, no publicly known foreign government (besides U.S. state-level agencies) has procured Taiwanese UAVs. Key barriers for foreign procurements include:

        - Absence of internationally recognized certifications (e.g., Blue UAS, Green UAS)
        - Lack of robust flight testing infrastructure: Compared to allied UAVs tested extensively in the Ukraine war, Taiwanese drones lack real-world performance validation.
        - Difficulty competing with low-cost Chinese drones, which remain widely adopted by U.S. agencies
    - Technology Gaps and Strategic Dependencies
        - Although Taiwan has achieved “China-free” status in final assembly, several critical technologies still depend on allied imports:
            - Three Chips: flight control, positioning, and communication chips
            - Two Software: flight control and positioning software
            - Gimbal camera; Thermal camera
        - Key reason for this dependency:
            - Despite Taiwan’s global leadership in IC manufacturing and design, the small UAV market and limited commercial return discourage firms from developing dedicated UAV chips.
- Supply Chain Risks
    - U.S. export controls: Thermal imaging modules remain subject to restrictions.
    - Chinese material dependency:
        - Battery cells rely on core materials (e.g., cathode/anode components) sourced from China
        - Electric motors rely on magnets made from China-sourced rare earth elements

10. Five Strategies: Objectives, Progress, and Recommendations:

In response to the challenges outlined above, the Taiwanese government introduced five strategies in 2025 to enhance the UAV industry. Below is a summary of each strategy's objectives, progress, and the recommendations proposed in this report.

Strategy I: Market Expansion Through Domestic and International Demand

Objective	Expand UAV procurement across government agencies and grow exports
Progress	• MND awarded the largest-ever domestic drone contract (NT$6.8B for 3,422 UAVs) in 2024. • Sixteen government agencies are expanding drone use, including fire, police, and coast guard units. In May 2025, the government announced a procurement plan for 47,000 UAVs over the 2025–2028 period. • Exports surged: 290 units (2023 H2) → 3,473 (2024) → 3,426 (Q1 2025) • EU (Poland, Germany, Czech Republic) overtook U.S. as main export market • TEDIBOA, a government-assisted UAV industry alliance, has signed nine MoUs with foreign partners since September 2024 • U.S.–Taiwan subsystem cooperation underway
Challenges	• Fragmented domestic procurement planning • Budget obstruction by opposition parties • High unit cost of Taiwan-made drones • Limited U.S. federal procurement access; not listed on Blue/ Green UAS • EU demand exceeds production; export compliance bottlenecks

Receommendations	1. Strengthen Procurement Planning and U.S.–Taiwan Alignment For Taiwan: • Develop a centralized, long-term UAV procurement roadmap across civilian and defense agencies, outlining mission roles, drone types, and quantities • Expand the Executive Yuan UAV/USV Task Force's role to consolidate procurement planning beyond fragmented local-level requests • Increase procurement of competitively priced domestic drones, alongside acquisition of foreign China-free UAVs For the U.S.: • Share procurement experience and Blue UAS program practices with Taiwanese counterparts • Use platforms like the GCTF to train Taiwanese public safety officials in UAV deployment and acquisition 2. Expand Budget and Mitigate Tariff Barriers For Taiwan: • Address tariff-related export challenges through legislative and diplomatic engagement For the U.S.: • Remove tariffs on Taiwanese UAVs and components to strengthen trusted supply chains • Recognize UAVs as strategic to Taiwan's defense and include them in bilateral defense budgeting discussions 3. Improve U.S. Market Access Through Certification and Local Engagement For Taiwan and the U.S.: • Help Taiwanese manufacturers obtain Blue UAS and Green UAS certifications to unlock U.S. federal and local procurement opportunities • Encourage partnerships between Taiwanese firms and U.S. state and local public safety agencies 4. Deepen Industrial Collaboration via Joint Partnerships For Taiwan and the U.S.: • Expand successful subsystem cooperation into broader co-production models and ODM (Original Design Manufacturing) partnerships 5. Strengthen End-User Verification and Export Compliance For Taiwan and the U.S.: • Develop a shared, verified end-user list to streamline compliant exports • Provide training and digital tools to help Taiwanese firms meet Know-Your-Customer (KYC) and export control requirements

Strategy II: Technology Development and International Collaboration

Objective	Advance R&D for “Three Chips, Two Software”; foster global partnerships; promote modularization
Progress	• Targeted R&D subsidies for chips and modules • Broader MOEA/NSTC subsidy programs launched
Challenges	• IC designers hesitant due to limited market • No dedicated support for modularization/standardization • Continued reliance on Chinese raw materials; U.S. export controls on sensors
Receommendations	For Taiwan: 1. Align chip subsidies with dual-use applications (drones and robotics) to match growing market demand and attract IC designers to invest. 2. Launch modularization and automation-focused subsidies. 3. Coordinate with the U.S. to secure non-PRC material sources.

Strategy III: Industrial Cluster and Ecosystem Formation

Objective	Build a vertically integrated UAV industry in Chiayi, with R&D, manufacturing, and testing facilities concentrated in dedicated industrial parks.
Progress	• Asia UAV Center (R&D) hosts 50+ entities; second phase planned • Minxiong Aerospace Park (Manufacture) under development • Dedicated UAV test site under review
Challenges	• Production remains dispersed • Industrial park funding blocked by opposition • Concerns over cluster vulnerability during wartime

Receommendations	For Taiwan: 1. Offer land/tax incentives for industry relocation 2. Promote early clustering with distributed fallback capacity
Strategy IV: Regulatory Framework and Cybersecurity Standardization	
Objective	• Align with U.S./allied cybersecurity and regulatory standards; • Expand testing capacity
Progress	• National cybersecurity standards and labs in place; • 22 drone models certified by local cybersecurity standard; U.S. CMMC compliance training underway • 21 UAV sandbox projects approved; permanent test site under review
Challenges	• No Taiwanese UAVs on Blue/Green UAS lists • High certification costs and lack of local validators for US certifications • Cyber threats from Chinese actors • Restrictive airspace/testing regulations
Receommendations	For Taiwan: 1. Build local Blue/Green UAS assessment capacity 2. Expand subsidies to support certification compliance 3. Streamline UAV airspace rules; expand test zones 4. Establish a permanent long-range flight corridor on the East Coast, especially for long-range drones procured by the MND; 5. Expand and integrate wind tunnel facilities across government agencies for use by domestic UAV manufacturers; 6. Use government procurement or subsidies to support local UAV companies in conducting test flights in third countries.

Strategy V: Enhancement of Defense Resilience	
Objective	Increase UAV deployment for defense, disaster response, and public safety
Progress	Major procurements by MND, Coast Guard, Fire Agency, and Police UAV adoption expanding across agencies
Challenges	Fragmented planning; budget blocks from opposition High unit costs; competition from non-PRC suppliers
Receommendations	For Taiwan: 1. Centralize procurement planning and boost funding 2. Encourage public-sector UAV use with local content incentives

2.1 Introduction: Taiwan's Strategic Framework for UAV Industry Development (2020–2028)

Taiwan's UAV policy has undergone a significant transformation over the past decade, evolving from a defense-focused initiative led by the National Chung-Shan Institute of Science and Technology (NCSIST) into a broader public-private industrial strategy aimed at cultivating a resilient and globally competitive drone ecosystem. This shift has been driven by three key factors: the evolution of modern warfare, lessons learned from Ukraine's rapid development of a domestic defense industry, and rising international demand for "China-free" supply chains. In response, the Taiwanese government has elevated UAVs to a strategic priority, linking them to both national defense and industrial innovation agendas.

Examining the "Three Objectives and Five Strategies" for Building a Commercial-Grade, Military-Use Drone Supply Chain

As outlined in the previous chapter, Taiwan currently sources its UAVs through three main channels: (1) attack drones developed in-house by NCSIST; (2) imported attack and ISR drones from the United States; and (3) domestically produced "commercial-grade, military-use" drones, procured by the Ministry of National Defense (MND) from Taiwanese private-sector manufacturers since 2022. These commercial-grade drones, largely categorized as Group 1–3 UAVs under U.S. DoD standards, are typically used for ISR missions, though some manufacturers have begun producing small FPV attack drones as well. In terms of scale, these systems constitute the core of Taiwan's drone deployment strategy. According to MND planning, by 2028 the government aims to field at least 3,000 commercial-grade, military-use UAVs, alongside 700 full-spec military UAVs.

This chapter focuses specifically on the emergence of this commercial-grade, military-use UAV supply chain. Framed by the Executive Yuan's "Three Objectives, Five Strategies" initiative—announced in 2025 and led by Vice Premier Cheng Li-chiun—this chapter assesses progress across each pillar of the strategy while identifying the key implementation gaps that have surfaced.

From the policy foundations laid during the Tsai Ing-wen administration to the current leadership under President Lai Ching-te, our analysis highlights clear areas of advancement: the growing presence of Taiwanese UAVs in international markets, especially in Europe; deeper participation of domestic firms in industry consortia such as TEDIBOA; strengthened international partnerships through MoUs and supply chain cooperation; and, most importantly, the introduction of a structured and actionable industrial strategy under the Executive Yuan. However, significant challenges remain in achieving scale, ensuring global certification, and securing sustained government procurement.

Methodology

To bridge the gap between policy analysis and real-world implementation, our team conducted extensive interviews with key stakeholders in Taiwan's UAV ecosystem from 2023 through early 2025. These included senior government officials involved in defense procurement and industrial planning, seven leading domestic UAV manufacturers—ranging from system integrators to module and component suppliers—as well as commercial drone companies that have secured

MND contracts. We also interviewed academic researchers and R&D stakeholders advancing UAV-related technologies. Due to the sensitivity of the subject, all interviews were conducted anonymously. In this report, their insights are referenced using the general categories "government stakeholders," "leading drone manufacturers," and "academic experts."

Drawing on these interviews and supplemented by export data, procurement records, and official strategy documents, this chapter identifies the critical bottlenecks in translating policy into scalable industrial outcomes. These challenges are organized into two categories: (1) those directly linked to the design and execution of the Five Strategies, and (2) systemic gaps that fall outside the current policy framework. The chapter concludes by offering targeted policy recommendations to address these gaps and further strengthen Taiwan's drone industry in both national and international contexts.

2.2 Overview of the Evolution of Taiwan's UAV Policy

As Taiwan strengthens its UAV industry, it must navigate an increasingly complex geopolitical environment shaped by cross-Strait tensions and U.S. policy shifts. As outlined in Chapter 1, Taiwan's UAV development is critical in countering China's expanding drone capabilities and ensuring ISR superiority. In particular, Taiwan's shift from a government-driven UAV program to a public-private model mirrors broader trends in **democratic drone innovation frameworks** led by the U.S., including Replicator and Blue UAS. Taiwan's UAV policy has evolved from the "Taiwan Team" framework launched by the Tsai administration in 2020 into a broader vision of becoming an Asia-Pacific UAV hub, spearheaded by the Lai administration in 2024, aligning with both national security imperatives and regional industrial expansion goals.

Since the 1980s, the National Chung-Shan Institute of Science and Technology (NCSIST) has been at the forefront of "military-grade, military used" UAV technology development. Recent geopolitical shifts, particularly the Russia-Ukraine War and post-pandemic supply chain restructuring, have catalyzed the need for accelerated UAV development and innovative approaches.

The foundation for Taiwan's UAV policy was laid in 2020, when UAVs were elevated within the national agenda as part of the Tsai administration's Six Core Strategic Industries framework. Since 2020, The government's effort consisted of three critical elements:

(1) Military Procurement of Commercial Drones: Integrating

commercial drone makers and component suppliers into the military procurement system to build a faster innovation and production ecosystem and accelerate the growth of Taiwan's drone supply chain;

(2) Drone Alliance for International Market: Building industrial alliances, including the Taiwan UAS Alliance, founded by the Ministry of Transportation and Communications (MOTC) in 2022, and the Taiwanese Excellence Drone Industry Alliance (TEDIBOA), founded by the MOEA in 2024, aims to integrate the supply chain and promote international market expansion. These efforts are designed to secure more sustainable orders, support mass production, lower production costs, and strengthen the viability of the supply chain;

(3) R&D Subsidies for Key Components and Systems : Subsidizing R&D for key components aims to reduce the drone supply chain's reliance on foreign sources, lower costs associated with foreign procurement, and increase competitiveness compared to Chinese counterparts. The government and industry are focusing on key components and systems under the framework of "Three Chips and Two Software" — flight control, positioning, and communication chips, along with flight control and positioning software — a strategy that remains central to Taiwan's goal of achieving technological self-reliance in drone development.

Below, this chapter will examine each line of effort to assess the progress made between 2020 and 2025 and identify the challenges that require joint solutions from the U.S. and Taiwanese governments.

2.3 Tsai Administration's Foundation: Military Procurement and R&D Subsidies (2020-2024)

2.2.1 Commercial-Grade Drones for Military Use: A Landmark Procurement

The military procurement of commercial-grade drones initiated by the Tsai administration laid a critical foundation for the growth of Taiwan's drone supply chain.

In September 2022, a landmark inter-ministerial meeting involving the MND, Industrial Development Administration of MOEA, National Science and Technology Council (NSTC), and NCSIST announced a procurement initiative for over 3,000 UAVs across five different specifications. The government identified nine leading manufacturers to compete for the contracts.

This NT$5 billion (US$156.25 million) military-specification tender marked the MND's first major commercial procurement plan in the UAV sector. The first wave focused on five commercial-grade military UAVs—maritime surveillance, land surveillance, reconnaissance, micro, and target drones—all classified as Group 1 to 2 small-to-medium-sized drones, based on the U.S. DoD's classification, with no lethal payloads and a strict exclusion of Chinese-made components. These UAVs were intended to serve both ISR and operational training missions while accelerating private-sector capacity building. The initiative represents a significant paradigm shift from NCSIST-centric development toward an integrated public-private ecosystem, synthesizing military requirements with commercial innovation.

By August 2024, the contract was ultimately revised and awarded to four drone makers—Taiwan UAV, Evergreen Aviation Technologies Corp, MiTAC Information Technology Corp, and Coretronic Intelligent Robotics Corp—with a total value of NT$6.8 billion (US$ 212.5 million) for the procurement of 3,422 drones, which will be delivered between 2025 and 2028.

Table 5:
Ministry of National Defense Tender for Military-Use Commercial-Grade UAVs

Source: Government e-Procurement System

Type	Shipborne Surveillance and Reconnaissance UAV	Land-Based Surveillance and Reconnaissance Drone	Surveillance and Reconnaissance Drone	Micro Drone	(Micro) Target Acquisition Drone	(Micro) Tactical Drone
Image (Source: MND)						Unreleased
Participating Companies	Geosat Aerospace & Technology Inc., Evergreen Aviation Technologies Corp., TAIWAN UAV Corp., FairTech Corp.	Geosat Aerospace & Technology Inc., Evergreen Aviation Technologies Corp., TAIWAN UAV Corp., Thunder Tiger Corp.	Coretronic Intelligent Robotics Corp., Thunder Tiger Corp., Acer Inc., Aiseed Inc., RuggON Corp	Geosat Aerospace & Technology Inc., Coretronic Intelligent Robotics Corp., Rdata System Corp., Vivian & Vincent International Trading Corp.	MiTAC Information Technology Corp., Strong Engineering Consulting Corp., Rdata System Corp., Thunder Tiger Corp.	MiTAC Information Technology Corp., Thunder Tiger Corp.
Winning Company	Evergreen Aviation Technologies Corp.	TAIWAN UAV Corp.	Coretronic Intelligent Robotics Corp.	Coretronic Intelligent Robotics Corp.	MiTAC Information Technology Corp.	MiTAC Information Technology Corp.
Award Amount (NT$)	NT$423,406,000 (US$13.13 million)	NT$2,409,600,000 (US$74.7 million)	NT$996,384,000 (US$30.89 million)	NT$1,281,418,380 (US$39.72 million)	NT$565,467,984 (US$17.53 million)	NT$1,277,659,113 (US$39.61 million)
Quantity (Units)	16	128	1,552	1,485	72	201
Classification (DoD standard)	Group 3	Group 3	Group 2	Group 1	Group 1	Unreleased

Based on publicly available data and insights gathered through interviews with leading Taiwanese drone manufacturers, these government contracts constitute a significant revenue stream for those manufacturers that win the bids. The production capacities of these leading firms are typically limited to a few hundred to a few thousand Group 1-2 drones annually, while government procurements surpass these levels. For instance, Coretronic, the only Taiwanese drone manufacturer with the capacity to export drones internationally, reported to *The Economics* in April 2025 that it produced only around 1,000 drones in 2024. However, the company secured a contract for 3,037 drones from a government tender, valued at NT$2.2 billion (US$ 73.33 million).

2.2.2 R&D subsidies for drones supply chain

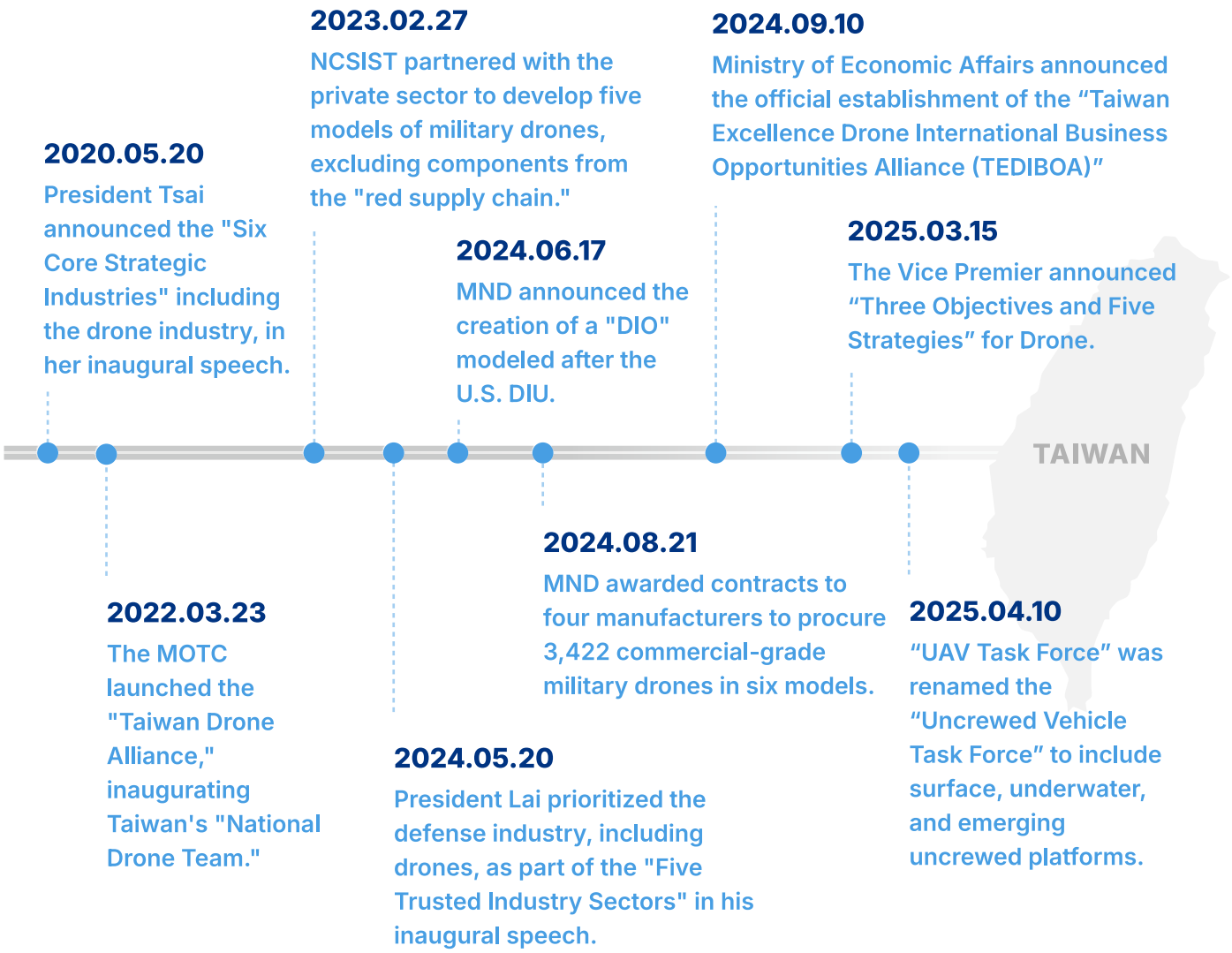
On the other hand, the Tsai administration's decision to subsidize leading drone manufacturers also laid the groundwork for further development.

In 2022, the Ministry of Transportation and Communications partnered with the private sector to establish the "Taiwan UAS Alliance," bringing together drone manufacturers and academic R&D teams to facilitate supply chain cooperation and international collaboration. In August 2022, the Tsai administration established the Asia UAV AI Innovation Application R&D Center and announced plans to set up "Drone Industrial Parks" in Chiayi County to support drone R&D.

As part of the "commercial-grade military use" procurement efforts, the Ministry of Economic Affairs (MOEA) also initiated R&D subsidy programs for selected leading drone manufacturers to co-develop drone system modules (such as battery modules, flight control modules, electric propulsion modules, application function modules, avionics and communication modules, etc.) and key technologies.

These efforts laid out a solid foundation for the Lai administration's public-private partnership in the drone supply chain. In September 2024, under the Lai administration, these initiatives were further integrated into a joint effort led by the Taiwanese Excellence Drone Industry Alliance (TEDIBOA), launched by the MOEA and leading drone manufacturers. By 2025, the Alliance had over 200 members, including drone manufacturers, key component suppliers, and R&D teams, serving as the core mechanism for coordinating international engagement, export readiness, and integration into democratic drone supply chains.

Figure 6:
Key Milestones in Taiwan's UAV Development (2020-2025)



2.4 Lai Administration's Priorities: Three Objectives, Five Strategies (2024–2028)

Entering office in May 2024, President Lai Ching-te and his administration have built upon the solid foundation established by the 2020 "Six Core Strategic Industries" plan to propose the new "***Five Trusted Industry Sectors***" framework in 2024. This framework identifies semiconductors, AI, military, security and surveillance, and next-generation communications as key industries for investment, with drones remaining a focus.

Under the Five Trusted Industry Sectors framework, the administration is committed to: (1) building a non-red supply chain for drones, making Taiwan the leading center for democratic drone supply chains in the Asia-Pacific region; (2) producing 15,000 drones per month by 2028; and (3) increasing the total value of the drone supply chain tenfold, reaching $30 billion NT$ ($1 billion US$). The framework signals a strategic pivot in Taiwan's UAV policy—shifting from a domestically focused development model toward global integration and market expansion.

To realize these policy goals, the Executive Yuan established the "Uncrewed Vehicle Task Force" in 2024 (expanding its previous focus from drones to include surface, underwater, and other future uncrewed vehicles). The Task Force announced the "***Three Objectives and Five Strategies***" to position Taiwan as the "Asia-Pacific Hub for the Democratic Drone Supply Chain."

The **THREE** core objectives:

1. Industrial development,
2. Defense self-reliant, and
3. Democratic supply chain integration.

To achieve these goals, it has developed **FIVE** specific strategies:

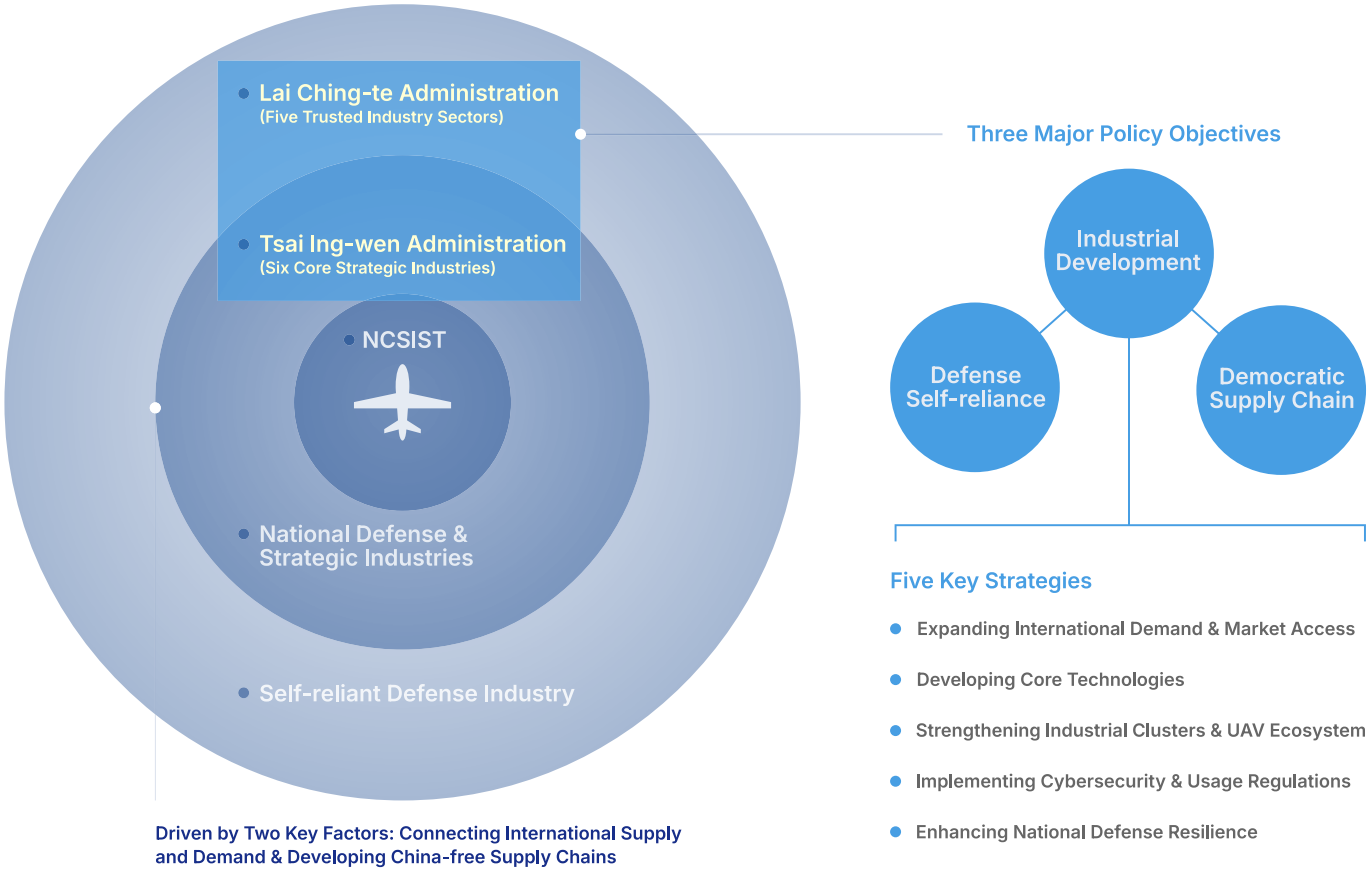
1. Market expansion through domestic and international demand,
2. Technology development and international collaboration,
3. Industrial cluster and ecosystem formation,
4. Regulatory framework and cybersecurity standardization, and
5. Enhancement of defense resilience.

At the cabinet's first anniversary in May 2025, Premier Cho Jung-tai reaffirmed that advancing semiconductors, drones, and intelligent robotics is a central priority for the Executive Yuan. He outlined three strategic goals for Taiwan's drone industry: boosting domestic production of core technologies, integrating military and commercial systems (including counter-drone capabilities) and developing industrial

clusters, with the latter serving as a prerequisite for the first two.

Below, this report, based on conclusions drawn from interviews with leading drone manufacturers and other stakeholders, will analyze each of the five strategies individually—examining their goal, progress, and challenges—and provide recommendations for advancing their implementation.

Figure 7:
The Evolution of Taiwan's UAV Strategy



2.5 The Three Objectives

The three objectives continue the efforts started since 2020 but add a new emphasis on democratic supply chain integration. These objectives are aligned with the industry's goal based on our interview findings.

(1) Industrial development: According to the Executive Yuan, the value of Taiwan's drone supply chain has increased from NT$1.3 billion (US$41 million) in 2021 to NT$5 billion (US$156 million) in 2024, reflecting integrated growth in both drone manufacturing and component production. The Lai administration has set a goal to increase this value tenfold by 2028, reaching NT$30 billion (US$938 million). Leading drone manufacturers interviewed echoed this objective, confirming that military procurement, R&D investment, and international expansion efforts have indeed helped grow the industry as a whole.

(2) Defense self-reliance: According to the 2025 Quadrennial Defense Review—a Ministry of National Defense (MND) report that the government is legally required to produce every four years and within the first ten months of a newly elected president's term—"Realizing Self-reliant Defense and Forging a UAV R&D Center" is listed as the top priority among the Lai administration's "Priorities for Promoting Defense Reforms." The goal of self-reliance is to "gradually increase indigenous production capability for key modules and components to achieve self-sufficiency in supply and maintenance."

Leading drone manufacturers, in interviews, generally agree with this policy objective; however, the defense self-reliance and industrial development do not always fully align. A former senior national security official, who had overseen drone development policy from 2020 to 2024, told DSET during an interview that, "the goal of self-reliance means Taiwan's supply chain needs the ability to produce **EVERY** key component. Once conflict, quarantine, or blockade breaks out in the Taiwan Strait, we would no longer have access to those key components and would face severe challenges in producing drones during wartime."

This goal has led the government to invest R&D resources into key components, including the "Three Chips, Two Software," which Taiwan currently sources not from China but imports from allied countries. Some leading manufacturers with more advanced self-design capabilities support this effort, citing that self-made key components—especially chips—subsidized by the government could lower production costs and make their drones more competitive.

However, others dispute this approach, arguing that although imported key components increase costs, Taiwanese drone makers can still benefit from "price-setting power" in military procurement

markets, particularly in countries with strict requirements for non-PRC-origin drone procurement. In their view, "subsidizing advanced chips is a redundant use of government funding; government resources should not focus on making every component in the short term, but rather prioritize industrial subsidies for export to boost the industry first."

(3) Democratic supply chain integration: The Taiwanese government aims to supply not only drones but also drone components, as the Vice Premier of Taiwan—who oversees the Executive Yuan's UAV Task Force—told The Wall Street Journal in January 2025: "This 'non-red' trend is a huge potential business opportunity for Taiwan [...] We'll be keeping a close eye on the requirements from key partners like the U.S., especially around requests for excluding Chinese components."

Leading drone manufacturers concurred with this strategy, noting that although drone exports to international markets remain limited (due to constraints discussed in later sections), following China's restriction of component exports to Ukraine in 2024 and its sanctions against prominent Western drone manufacturers, Taiwan's drone component exports have surged. Several leading drone makers have since focused on promoting and selling their components to the United States and Europe.

2.6 The Five Strategies

The following section provides a detailed overview of the objectives, progress, challenges, and recommendations concerning the Executive Yuan's "Five Strategies." The objectives outlined herein are drawn from the policy declaration issued by the Executive Yuan in March 2025.

2.6.1 Strategy I: Market Expansion Through Domestic and International Demand

- **2.6.1.1 Objective:**

The first strategy centers on increasing procurement across government agencies and expanding access to international markets.

According to the Executive Yuan, "Government agencies are required to actively develop diverse applications for drones, expand procurement of drone products and services, and fully promote overseas business opportunities to align with international markets. Currently, Taiwan has signed cooperation agreements with countries including the United States, Poland, Latvia, Lithuania, and the Czech Republic, and is actively pursuing international orders."

- **2.6.1.2 Progress:**

1. **Progress on Domestic Government Procurement Expansion:**

   The government's domestic market expansion efforts focus on increasing public procurement, exemplified by the Ministry of National Defense's (MND) largest-ever domestic drone purchase, valued at NT$ 6.8 billion (US$ 210 million). In parallel, 15 other government agencies have also launched their respective drone procurement initiatives. The Coast Guard may be the second-largest source of procurement orders and expressed its intention in May 2025 to expand its drone unit, although the exact volume and value of the orders have not been specified.

   The MND currently leads Taiwan's drone procurement efforts, with an investment of NT$6.8 billion (US$ 212.5 million) for the acquisition of 3,422 drones during the 2024–2028 period. This represents the largest single procurement initiative among government agencies to date. Beyond the MND, the Executive Yuan has projected that 16 government agencies will increase their procurement of drones for various operational applications between 2024 and 2028. According to government procurement tender notices, agencies planning to procure drones in 2025 include the National Fire Agency, Ministry of Agriculture, local police departments, National Immigration Agency, Taiwan Power Company, and the Coast Guard Administration.

   In April 2025, the Taiwanese government proposed a special budget in response to tariffs imposed by the Trump administration, totaling NT$410 billion (US$12.6 billion). Of this amount, NT$150 billion (US$4.6 billion) was designated to bolster defense resilience, including drone procurement—though the specific allocation for drones has not been clarified. In parallel, the Executive Yuan announced in May

2025 that it plans to procure at least 47,000 drones over a three-year period. However, as of May 2025, opposition parties have proposed canceling the NT$150 billion defense allocation.

In parallel with military procurement, the Coast Guard Administration is anticipated to undertake the second-largest drone acquisition effort. In response to intensifying maritime security challenges posed by the PRC, the Coast Guard initiated the development of its UAV Unit in 2018, beginning with the procurement of 20 drones at a cost of NT$90 million (US$ 2.8 million). In 2019, the agency estimated that enhancing its drone capabilities to meet mission requirements would require a total investment of NT$5 billion (US$ 156.25 million). In May 2025, the Coast Guard announced its intent to procure second- and third-generation UAV systems to further expand and modernize its operational capacity. Detailed information on the budget and procurement scale has yet to be released.

2. **Progress on International Market Expansion:**

   The government-facilitated drone industry alliance, TEDIBOA, has advanced international outreach by signing nine MoUs with industry associations across eight countries since its establishment in September 2024. Between 2023 and 2025, Taiwan's drone exports experienced rapid growth, particularly in European markets, while expansion in the U.S. remained limited. Despite this momentum, Taiwanese manufacturers continue to face significant challenges, including competition from low-cost Chinese rivals, limited access to government procurement channels in the U.S. and EU, constrained production capacity, and uncertainty surrounding sustained demand from markets potentially linked to the war in Ukraine.

Table 6:
MoUs on UAVs Signed Between TEDIBOA/ MOEA and Foreign Partners (2024–2025)

(Source: TEDIBOA)

Time	Country/ Signing Entity	Signing Entities	Objectives
Sep 2024	U.S. (Arizona)	Arizona State Government & MOEA (Taiwan)	Deepen collaboration on UAVs and semiconductors, and enhance high-tech personnel exchanges.
Oct 2024	U.S. (Oklahoma)	Oklahoma Defense Industry Association (ODIA) & TEDIBOA (Taiwan)	Establish strategic partnerships and an exchange platform for international drone industry promotion, advanced technology development, and supply chain cooperation.
Nov 2024	Poland	Polish-Taiwanese Chamber of Industry and Commerce & TEDIBOA (Taiwan)	Promote international expansion of the drone industry, develop advanced technologies, and strengthen supply chain collaboration.
Nov 2024	Lithuania	Lithuanian Defence and Security Industry Association & TEDIBOA (Taiwan)	Integrate the drone industry with the European supply chain and strengthen alignment in technologies and business opportunities.
Feb 2025	Latvia	Latvian Federation of Defence and Security Industries (FSDI) & TEDIBOA (Taiwan)	Promote bilateral cooperation in the drone industry and expand regional business opportunities.
Feb 2025	Czech Republic	Czech-Taiwanese Business Chamber (CTBC) & TEDIBOA (Taiwan)	Develop business opportunities for drones in Europe.
Mar 2025	Japan	Japan Drone Consortium (JDC) & TEDIBOA (Taiwan)	Establish a UAV supply chain, with a focus on collaboration in disaster relief operations.
May 2025	Estonia	Estonian Defence and Aerospace Industry Association, Estonia Aviation Cluster & TEDIBOA (Taiwan)	Collaborate on drones, aerospace and related industries.
May 2025	U.S.	Association for Unmanned Vehicle Systems International (AUVSI) & TEDIBOA (Taiwan)	Establish a trusted supply network free from potential adversaries

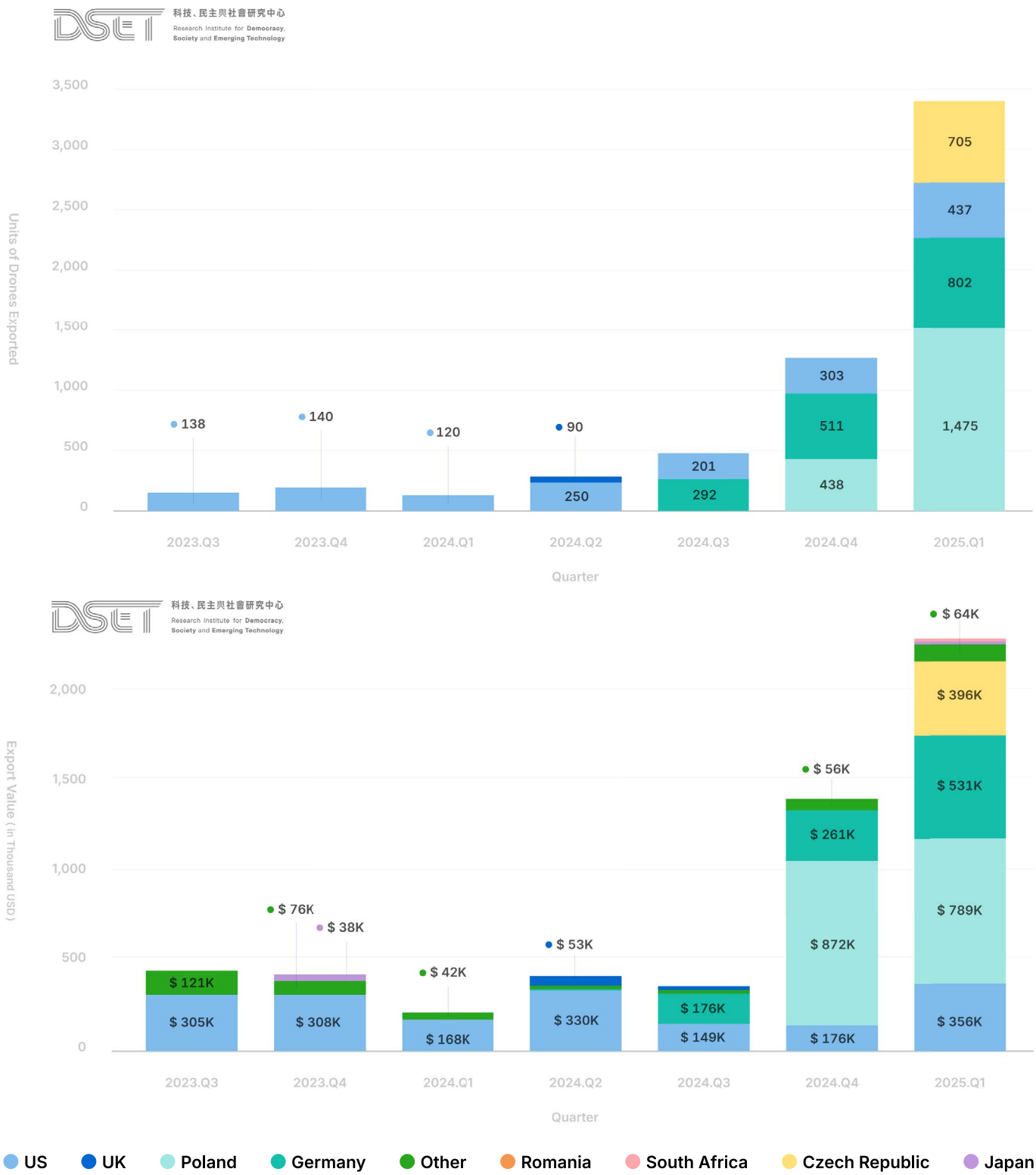
Breakdown of UAV Exports

Export statistics from Taiwan's Customs Administration covering Q3 2023 to Q1 2025 reveal that (1) Taiwan's UAV export market is rapidly expanding and diversifying, with Europe overtaking the United States as the primary destination; and (2) the export strategy appears to be shifting from high-value, low-volume sales to the U.S. toward high-volume, lower-value sales to Europe.

Accelerated Export Growth and Market Diversification

Taiwan's drone exports have demonstrated significant growth, increasing from 290 units in the second half of 2023 to 3,473 units in 2024. Correspondingly, export value rose from US$ 848,000 in 2023 to US$ 2.32 million in 2024, with an estimated 3,426 units valued at US$ 2.16 million recorded in the first quarter of 2025 alone. Key export markets include Poland, the United States, and Germany. Since the second half of 2024, Europe has overtaken the United States as the primary export destination for Taiwanese drones.

Figure 8:
Quarterly Drone Exports by Destination Country (2023 Q3-2025 Q1)



Evolution of Key Export Destinations

The United States was the dominant market through Q3 2024, consistently accounting for over 70% of export value. However, from Q4 2024 onward, there was a pronounced shift as Poland, Germany, and the Czech Republic emerged as principal destinations. By Q1 2025, Poland accounted for 36.5% of export value, while the US share declined to 16.5%.

European Expansion and Volume Growth

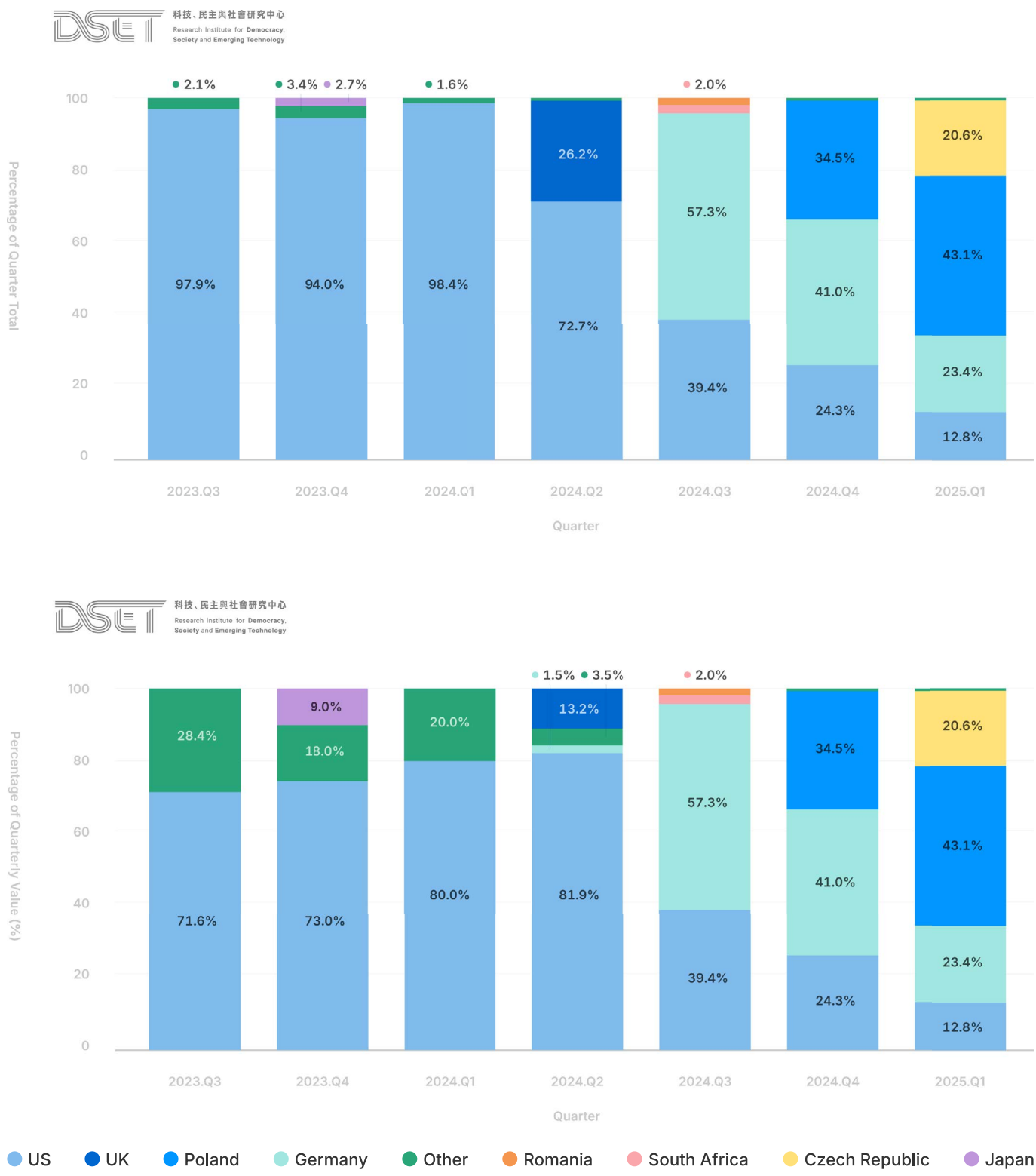
The export volume to Poland saw a sharp increase, from 430 units (24.5%) in 2024 H2 to 1,475 units (43.1%) in 2025 Q1. Germany and the Czech Republic, previously minor players, together accounted for 44% of all units exported in early 2025. This marks a clear shift in Taiwan's UAV export focus toward Europe.

Volume vs. Value Dynamics

By 2025 Q1, Poland led in unit volume but not in value, indicating a lower average price per UAV. In contrast, Taiwan exports fewer units to the US and Germany, but at higher average values, reflecting a focus on advanced or specialized UAVs.

Figure 9:
Quarterly Drone Export Share by Destination Country (2023 Q3-2025 Q1)

Source: DSET, based on Taiwan Customs Administration data.



Note:

1. *Taiwan began classifying drone exports under a distinct HS Code (HS 8806) in June 2023; as a result, official export data is available starting from the second half of 2023;*

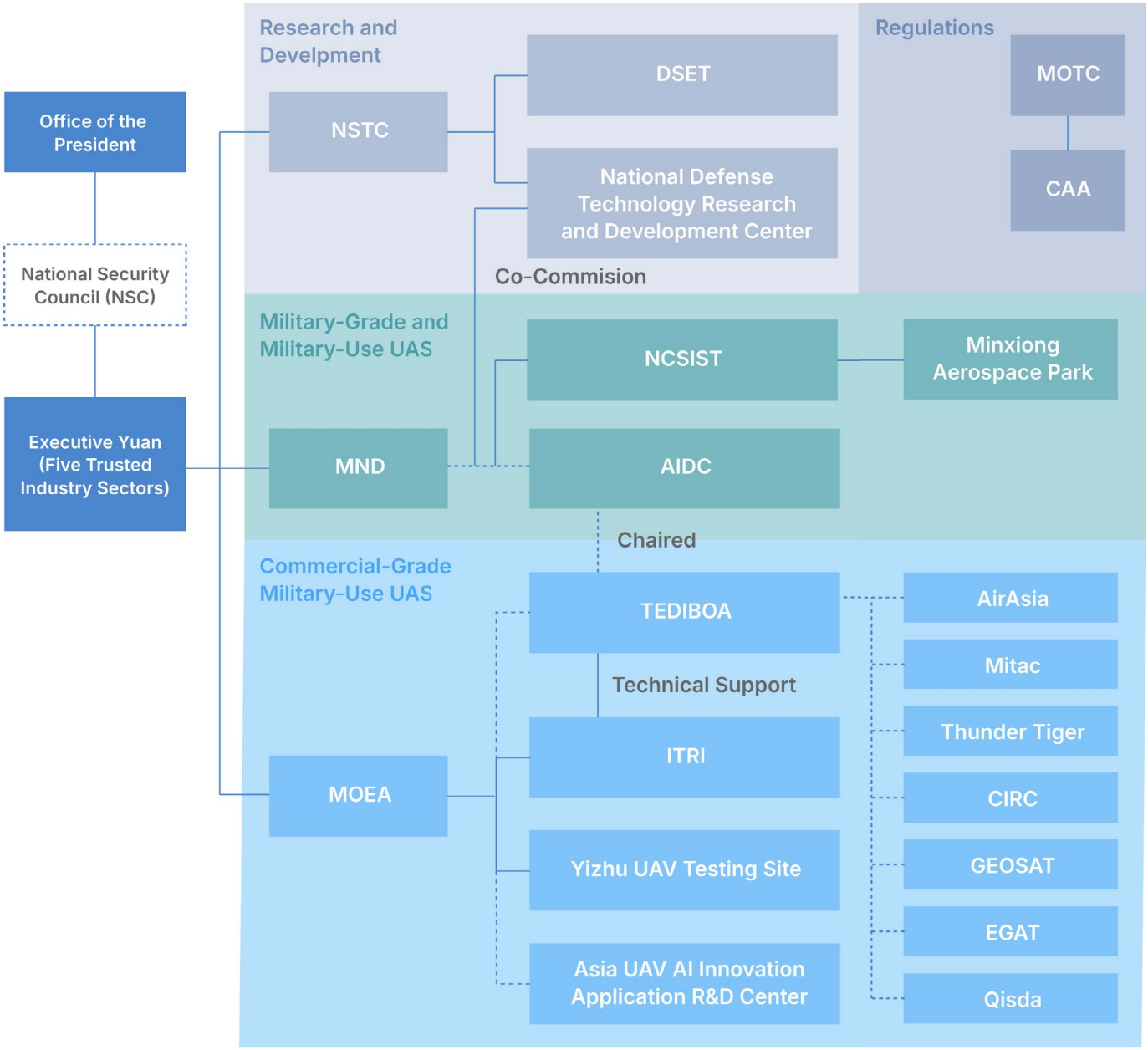
2. *The data only covers UAVs and does not include UAV modules, parts, or other components. Since Taiwan's customs data does not separately categorize UAV parts, export data for these items is not publicly available.*

3. *This statistic excludes re-export data. According to Taiwan's regulatory definition, re-export data refers to "goods imported for inward processing without a change in country of origin, and subsequently returned or resold abroad after importation."*

Progress on Government-Led UAV International Cooperation

The government supported the establishment of the Taiwan Excellence Drone International Business Opportunities Alliance (TEDIBOA) in September 2024. As a national drone industry alliance, TEDIBOA is co-chaired by the Aerospace Industrial Development Corporation (AIDC)—a defense contractor and leading Taiwanese aerospace firm—alongside several of Taiwan's foremost drone companies. By 2025, the alliance had grown to include over 200 member companies spanning the drone and component supply chain.

Figure 10:
Whole-of-Government Approach to UAV Development in Taiwan



NSTC – National Science and Technology Council (國家科學及技術委員會)

MOTC – Ministry of Transportation and Communications (交通部)

CAA – Civil Aeronautics Administration (民航局)

MND – Ministry of National Defense (國防部)

NCSIST – National Chung-Shan Institute of Science and Technology (國家中山科學研究院)

AIDC – Aerospace Industrial Development Corporation (漢翔航空工業公司)

MOEA – Ministry of Economic Affairs (經濟部)

TEDIBOA – Taiwan Excellence Drone International Business Opportunities Alliance

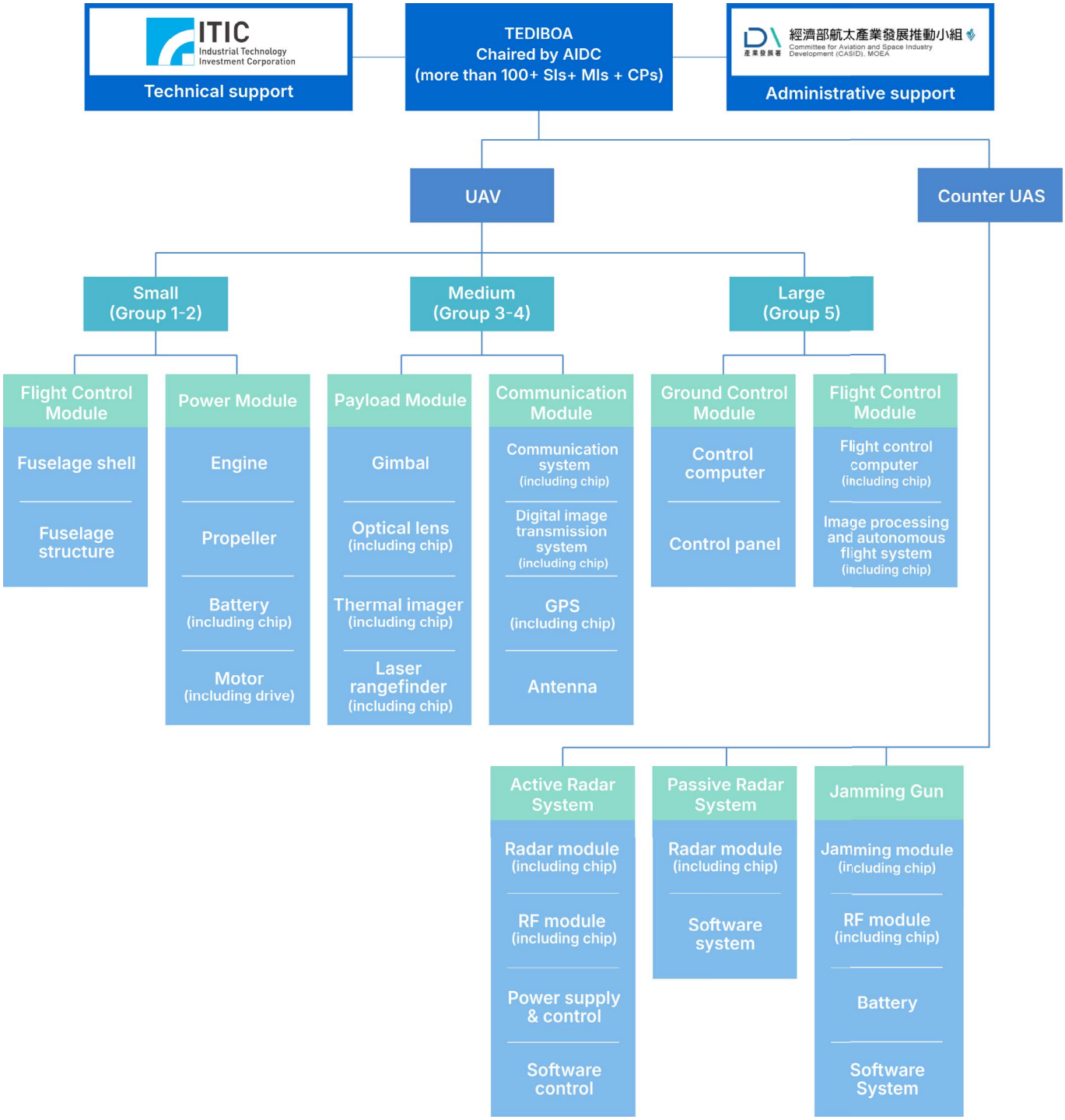
ITRI – Industrial Technology Research Institute (工業技術研究院)

CIRC – Central Information Research Corporation (中光電智能感測科技股份有限公司)

EGAT – Evergreen Aviation Technologies (長榮航太科技)

Figure 11:
TEDIBOA Industry Map: Taiwan's Collaborative Framework for UAV and Counter-UAS Systems

Source: TEDIBOA Website



TEDIBOA's international market expansion efforts focus on strengthening Government-to-Government (G2G) cooperation with U.S. states, Japan, and EU countries through Memoranda of Understanding (MoUs) signed with key foreign industrial associations. As of May 2025, the Ministry of Economic Affairs (MOEA) and TEDIBOA have signed nine MoUs with foreign entities to enhance cooperation in supply chain integration, technological advancement, and market access.

In parallel, TEDIBOA has advanced Business-to-Business (B2B) engagement by organizing delegations of Taiwanese drone manufacturers to participate in international drone exhibitions—most recently XPONENTIAL Europe 2025 in Germany (February 2025) and XPONENTIAL Houston in the U.S. (May 2025)—to facilitate contractual partnerships. These efforts have resulted in B2B cooperation initiatives, particularly with EU countries, focused on the co-development of drones and critical components.

The exact increase in drone and drone component exports resulting from these MoU efforts remains unclear. In March 2025, TEDIBOA told the press that comprehensive statistical data is still being compiled and is expected to be released in late May 2025.

Progress on Overseas Orders

Interviews conducted by DSET with seven major Taiwanese drone manufacturers corroborate trends observed in official export data. Over the past two years, Taiwan's drone exports have witnessed a substantial increase, primarily driven by rising demand from European markets. By contrast, interest from the United States has remained comparatively limited. At present, the only publicly known Taiwanese company exporting drones to the U.S. is Coretronic Intelligent Robotics Corporation (CIRC), which primarily supplies drones to state-level police and public safety agencies.

As shown in the export data, thousands of drone units have been exported annually to the EU since 2024. However, according to all drone manufacturers interviewed by DSET, market demand from European buyers has significantly exceeded the current export volume, with individual requests often reaching **tens of thousands of units**. Nevertheless, due to constraints such as limited production capacity, export control regulations, insufficient due

diligence capabilities, and broader geopolitical uncertainties, the majority of these inquiries have not materialized into confirmed orders.

By contrast, exports of **drone components** have demonstrated notable growth in international markets. Interviews indicate that, following China's imposition of sanctions on U.S. drone manufacturer Skydio in October 2024, a number of American firms began engaging with Taiwanese component suppliers. However, it remains unclear whether these inquiries have resulted in finalized contracts. On the European side, several Taiwanese manufacturers with component production capabilities reported increased export volumes during the latter half of 2024, though they declined to specify the exact product types, quantities, values, or destination countries.

Progress in the U.S. Market: According to official export data, Taiwan's UAV exports to the United States have grown in recent years but remain limited in scale. Exports increased from 278 units in the second half of 2023 to 874 units in 2024, and 437 units in the first quarter of 2025. In terms of value, shipments rose from US$613,000 in 2023 H2 to US$823,000 in 2024, and US$356,000 in Q1 2025. Despite this upward trend, these exports have yet to enter U.S. federal procurement channels.

To date, only one company—Coretronic Intelligent Robotics Corporation (CIRC)—has been publicly identified, supplying small ISR drones (Group 1 under U.S. DoD classification) to state-level police departments and public safety agencies through an Original Design Manufacturer (ODM) partnership with Teledyne Technologies Incorporated, based in the US. There are no confirmed federal-level sales from Taiwan on record.

Over the past two years, both the U.S. and Taiwanese governments have sought to strengthen cooperation in the drone sector. In a March 2025 interview with Taiwanese media, AIT Director Raymond Greene emphasized the potential for future collaboration: *"Taiwan has a very developed defense industrial base, but also many strong manufacturers in the civilian sector. I think they can apply their skills and experiences as we work, especially in dual-use areas like drones and new satellite systems. So we might be able to work together."*

In response, Taiwan's Minister of National Defense,Wellington Koo, confirmed that the U.S. was actively pursuing cooperation on building a "non-Red" drone supply chain with Taiwan, noting in March 2025 that "tangible progress" had been made and that both civilian industry and the National Chung-Shan Institute of Science and

Technology (NCSIST) would soon announce new developments.

In September 2024, the U.S. Department of Commerce and the American Institute in Taiwan (AIT) led the largest-ever **Taiwan Uncrewed Aircraft Systems (UAS) and Counter-UAS (C-UAS) Business Development Mission**, first reported by the Financial Times. The delegation included U.S. officials and representatives from 26 American drone and counter-drone companies, alongside personnel from the Departments of Commerce and Defense. While the stated goal was to promote bilateral cooperation in drone technology development and procurement, AIT's public statement framed the mission more narrowly as a trade initiative to "explore market opportunities for U.S. companies in Taiwan."

Interviews conducted by DSET with participating Taiwanese drone firms suggest that the delegation was primarily focused on promoting American drone platforms and sourcing Taiwanese components, rather than pursuing procurement or strategic partnerships with Taiwanese manufacturers.

Nevertheless, the Ministry of National Defense emphasized that Taiwan–U.S. drone cooperation, led by NCSIST, has made tangible progress in the area of UAV subsystem collaboration. Following AIT Director Greene's remarks in March 2025, Minister Koo reaffirmed that progress had been made since the September 2024 U.S. visit. He noted that both NCSIST and private Taiwanese firms had begun joint development efforts with U.S. counterparts and that results were expected soon.

Defense sources familiar with the matter told the press that an increasing number of American companies have since initiated exploratory talks. The goal of these discussions is to integrate mature Taiwanese subsystems into next-generation UAVs, reduce R&D timelines, and accelerate deployment. The cooperation model reportedly involves two tracks:

1. **Incorporating competitive, cost-effective Taiwanese subsystems into existing U.S. or allied platforms** to strengthen supply chains and enable localized production.

2. **Sourcing select U.S. subsystems to complement Taiwan's domestic R&D**, reducing development costs and timelines while improving interoperability.

Progress in EU Market: According to export data (See: Figure 5 and 6) Taiwanese UAV exports to the EU have risen sharply—from zero units in 2023 H2 to 1,323 units in 2024 (US$1.36 million), and 2,982 units in Q1 2025 (US$1.72 million), with

key destinations including Poland, Germany, and the Czech Republic.

In interviews, all leading Taiwanese drone manufacturers confirmed to DSET that they have seen a substantial increase in order inquiries since 2024, often reaching into the tens of thousands of units per order, particularly following China's export ban on drones and drone components to Ukraine. However, due to capacity constraints and other limitations discussed below, most of these inquiries have not resulted in confirmed orders.

On component exports to the EU, interviewees expressed greater confidence. Several drone manufacturers reported successfully delivering drone component orders, especially batteries, to European countries, with additional inquiries for key components stemming from meetings held during TEDIBOA-led delegations to the region. Interviewees explained that, as the Taiwanese government increases its investment in the industry, Taiwanese firms have been able to produce key components at lower costs than many European suppliers, thereby attracting more inquiries and orders.

2.6.1.3 Challenges

1. **Challenges in Domestic UAV Procurement**

    01. **Gaps in Strategic Procurement Planning:** Both defense and civilian agencies still lack an integrated, long-term procurement strategy. In contrast to the U.S. Department of Defense—which regularly publishes documents such as the Unmanned Systems Integrated Roadmap 2017–2042—Taiwan's Ministry of National Defense has only released a 2024–2028 plan for commercial-grade military drones, with other efforts remaining fragmented. Civilian drone procurement is also expanding, but continues to lack cross-agency coordination.

    02. **Budget Obstruction:** Budget boycotts by opposition parties have continued to slow efforts to expand domestic procurement. Notably, the NT$150 billion (US$4.6 billion) proposed by the government in April 2025

allocation for strengthening defense resilience—including the development of unmanned aerial vehicle (UAV) infrastructure—has been a key target of opposition-led obstruction, further delaying the pace of UAV procurement.

03. **Higher Unit Costs of Taiwanese UAVs Limit Government Procurement:** Since 2020, the Taiwanese government has enforced a blanket ban on the use and procurement of Chinese-brand information and communications technology (ICT) products by public agencies, including drones. As a result, DJI drones—once widely used across police, firefighting, and other government units—have been decommissioned or placed in storage.

    However, replacing Chinese-made drones with alternatives has significantly increased procurement costs. According to reports from 2021, the price of "non-Red" drones can be two to three times higher than their Chinese counterparts. With limited agency budgets and few cost-effective substitutes, some government departments have opted to suspend drone procurement altogether.

04. **Taiwanese UAVs Face Competition from Other Non-Red Foreign Suppliers:** Beyond Chinese-made systems, Taiwanese UAV manufacturers also face procurement competition from other "non-Red" foreign suppliers. Notably, the American drone company Skydio has been selected as a supplier for Taiwan's National Fire Agency, highlighting the competitive pressure Taiwanese firms face even in their home market.

2. Challenges in International Market Expansion

In both the U.S. and European markets, Taiwan continues to face competition from low-cost Chinese drones, as well as limited access to government-level procurement opportunities. While the U.S. government has adopted a more proactive approach in promoting collaboration between the Taiwanese and U.S. drone industries, actual progress in expanding Taiwan's exports remains limited. Although Taiwan's drone exports to Europe have grown significantly, further expansion is constrained by limited domestic production capacity, insufficient due diligence capabilities to handle complex drone orders, and uncertainties related to the ongoing war in Ukraine. These factors continue to pose significant challenges for Taiwanese manufacturers seeking to scale up their exports.

Challenges in the US market:

1. **Higher Costs Compared to Chinese Sources**

   Taiwanese drones continue to face significant price competition from Chinese-made drones in the U.S. procurement market. Although federal agencies are prohibited from procuring Chinese drones, and the FY2025 National Defense Authorization Act (NDAA), passed in 2024, mandates that an "appropriate national security authority" make a determination by the end of 2025 as to whether DJI and Autel pose a national security risk, these brands have not yet been fully banned from the broader U.S. market. Several state governments have enacted procurement bans on Chinese drones; however, Chinese-made drones remain widely available in the commercial market and are still widely used by local police and public safety agencies. Taiwan's only current entrant in this segment, Coretronics, focuses on supplying drones to U.S. state-level law enforcement and public safety agencies, but continues to face intense price pressure from Chinese competitors.

2. **Limited Access to U.S. Federal Procurement**

   In procurement channels where Chinese drones are excluded—such as within U.S. federal defense and national security agencies—Taiwanese drones have yet to gain significant traction. As of May 2025, no Taiwanese manufacturers have been included on the U.S. Department of Defense's Blue UAS list, which was launched by the Defense Innovation Unit (DIU) in 2020 to identify trusted vendors. Although the list is expected to expand to include manufacturers from France, Germany, and Ukraine, no Taiwanese firms have been selected to date. Similarly, no Taiwanese manufacturers are currently listed under the Green UAS initiative—an industry-led verification list intended for non-defense federal agencies and state/local government use. The Taiwanese government is actively working to support domestic firms in obtaining these certifications (see Section 2.3.5, Strategy IV: Regulatory Framework and Cybersecurity Standardization).

3. **Initial U.S.–Taiwan Industry Coordination Has Yet to Translate into UAV Exports**

   Although the U.S. Department of Commerce and the American Institute in Taiwan (AIT) facilitated a U.S. drone industry delegation to Taiwan in September 2024, and Taiwan's Ministry of National Defense has reported tangible progress in subsystem-level cooperation, such efforts have yet to result in significant UAV exports from Taiwan to the United States. Interviews conducted by DSET with industry representatives also

indicate that procurement interest from both U.S. public and private sectors remains limited.

4. **Challenges Posed by Tariffs under the Trump Administration**

   Following the Trump administration's announcement of a "reciprocal tariff" policy on April 2, 2025, concerns have emerged regarding its potential impact on Taiwan's drone supply chain. Some Taiwanese companies have taken early action by establishing component manufacturing facilities in the United States to mitigate tariff exposure. However, such moves may conflict with Taiwan's broader strategic objective of expanding domestic production capacity for unmanned systems.

Challenges in the EU market:

In the European market, Taiwanese manufacturers face similar challenges as in the US, including competition from low-cost Chinese drones and limited access to government procurement channels. Since its establishment in September 2024, TEDIBOA has signed nine Memoranda of Understanding (MoUs), six of which were with industry associations in European countries. However, there are currently no known records of European governments procuring Taiwanese drones. In May 2025, media reports indicated that TEDIBOA had visited the Lithuanian Ministry of Defense and may be exploring potential co-production of drones between Taiwanese firms and the Lithuanian government. If confirmed, this would mark the first instance of cooperation between a European government and Taiwanese drone manufacturers, though no official confirmation has been issued as of yet.

Nevertheless, following China's export ban on drones to Ukraine in 2024, Taiwan's drone exports to Europe have seen significant growth. According to interviews conducted by DSET with industry stakeholders, however, Taiwanese companies still face the following barriers to further market expansion in Europe:

1. **Limited production capacity:** Based on DSET interviews, most Taiwanese drone manufacturers currently have the capacity to produce only hundreds to a few thousand units annually, far below the scale of EU inquiries, which often request thousands or even tens of thousands. "We simply can't scale up that quickly," a view

shared by several interviewees.

2. **Uncertainty surrounding Ukrainian demand:** "Even if I expand production, how do I know it's not just a one-time deal?" Many manufacturers have expressed concern that current EU inquiries may be driven primarily by short-term wartime demand. While no drone manufacturer has confirmed direct exports to Ukraine, several companies suspect a possible indirect connection, as many of the orders have come from European countries bordering Ukraine. With Ukraine ramping up domestic drone production and aiming to make it a pillar of post-war recovery, Taiwanese firms worry the demand may not be sustainable—and could even lead to new competition in global markets. As a result, many are reluctant to take the risk of expanding investment. At the same time, however, Taiwanese exporters are more optimistic about the growing demand for drone components in the Ukrainian market.

3. **Limited due diligence capacity:** Several interviewees also cited difficulties in verifying the origin and credibility of these inquiries. "The majority of inquiries have come from individual brokers with no verifiable history in the drone business. From a business perspective, we can't afford the risk of being scammed; from a regulatory standpoint, we cannot meet the government's 'Know Your Customer' requirements if we can't confirm the final destination of our exports," interviewees explained.

2.6.2 Strategy II: Technology development and international collaboration

- **2.6.2.1 Objective:**

The second strategy emphasizes the advancement of key drone technologies, and further advancing **modularization and standardization** to enhance international competitiveness.

According to the Executive Yuan, *"For key drone components, the government will support technological development through multiple approaches, including early-stage R&D led by research institutes, offering tax incentives to encourage private sector innovation, and promoting international joint production. In the future, the government also plans to coordinate with the National Development Fund to drive policy-based investments aimed at facilitating mass production, building a comprehensive industrial supply chain, and further advancing modularization and standardization to enhance international competitiveness."*

The Executive Yuan also stated that these R&D resources will be focused on developing the most critical components of drone systems, known as the "Three Chips and Two Software

Systems":

- Flight control chips and modules
- Communication chips and modules
- Satellite positioning chips and modules
- Flight control software
- Ground control software

The Minister of the National Development Council, Paul Liu, who oversees Taiwan's drone supply chain development, explained the focus of recent efforts in December 2024: "Chips from China are full of risk; however, we dont even have a **SINGLE DRONE CHIP** (designed) in Taiwan!"

MOEA officials noted that Taiwanese manufacturers currently rely on foreign sources for these critical components and modules, but the costs are significantly higher. According to an academic expert involved in designing the government's subsidy programs, interviewed by DSET, these foreign components are much more expensive than their Chinese counterparts. For example, the communication chips purchased by Taiwanese firms are **Ten Times** more expensive than DJI's self-designed chips.

- **2.6.2.2 Progress :**

To advance this objective, government subsidies for drone-related research and development can be broadly classified into two categories: (1) drone chip and module R&D and, (2) other critical component and software R&D.

To advance this objective, government subsidies for drone-related research and development can be broadly classified into two categories: (1) drone chip and module R&D and, (2) other critical component and software R&D.
Among these efforts, the government has prioritized R&D for drone AI image sensor modules and flight control systems, allocating NT$110 million (US$3.38 million) to these areas in 2025.

In contrast, subsidy allocations for other critical chips, components, and systems are incorporated into broader, more general funding programs, without specifying the amounts allocated to each item. Furthermore, although the Executive

Yuan has identified the advancement of modularization and standardization to support mass production as part of its "future plans," no specific projects have yet been announced to support this objective.

According to DSET interviews, stakeholders familiar with these R&D subsidy programs are increasingly optimistic about Taiwan's entry into the UAV chip sector. While the previously limited market size discouraged investment, the rapid growth of the global drone and robotics markets has prompted several Taiwanese IC design firms to allocate R&D funding. Stakeholders believe Taiwan has strong potential to develop critical drone chips, compete with low-cost Chinese alternatives, and supply key components to drone manufacturers worldwide.

1. Progress on Drone chip and module R&D

In 2023, the Taiwanese government launched the "Taiwan Chip-based Industrial Innovation Program", allocating NT$300 billion (US$9.3 billion) from 2024 to 2033 to leverage its semiconductor strengths to advance AI applications. Under this initiative, the Ministry of Economic Affairs (MOEA) oversees the "Chip-Driven Industrial Innovation in Taiwan – Key Drone Chips and Industry Acceleration Plan"; As part of this plan, the MOEA plans to invest **NT$348 million (US$11.05 million)** in drone chip R&D in 2025.

The drone chip R&D subsidies were supported by the MOEA's two projects:

1. Subsidy Program for the Autonomous R&D of Key Drone Chips and Modules (無人機關鍵晶片及模組自主開發研發補助計畫) : launched in January 2025, with a budget of NT$110 million (approx. US$3.38 million). It supports domestic development of AI image processing modules and low-cost flight control boards.

2. IC Design Flagship Subsidy Program (IC 設計攻頂補助計畫): Also launched in January 2025, it funds advanced chip R&D in general, including drone chip R&D, without specifying which types of drone chips it may focus on.

As of May 2025, both programs are still in the applicant review stage.

2. Progress on other critical components and softwares R&D

Regarding subsidies for other drone components and systems, both the MOEA and the NSTC have launched subsidy programs. However, unlike the programs mentioned above that explicitly allocate funding for specific chips and modules, these are more general subsidy schemes and do not provide detailed budget breakdowns

for the individual components or system items being supported.

1. The MOEA has launched the "Military-Grade Commercial Drone R&D Subsidy Program" (2022) and the "Dual-Use Drone Capability Development Program" (2023, 2024, 2025) to subsidize and "assist industry in developing key drone modules and technological applications that align with Taiwan's national defense innovation needs and industrial strengths". The exact budget allocation for each component and system has not been specified. In 2024, the programs subsidized 13 key drone manufacturers, while the new subsidy project for 2025 was only announced in May.

2. The NSTC's "UAV Key Technology Forward-Looking Research and Development Program" (2024, 2025), which focuses on "fixed-wing swarm systems, autonomous navigation capabilities, heterogeneous cooperation frameworks, advanced communication networks, rapid mapping technologies, and counter-UAV defensive systems", while the exact budget allocation for each component and system has also not been specified.

- **2.6.2.3 Challenges:**

Overall, the current subsidy programs face two major challenges: Due to the limited market, Taiwanese IC design companies have yet to engage extensively in the drone chip industry.; Further integration is needed to streamline the government's subsidy roadmap.

(1) IC Designers Wary Amid Market Limits

In interviews with DSET, leading drone manufacturers and experts familiar with the structure of Taiwan's subsidy programs reported that Taiwanese drone companies still rely on critical chips from foreign suppliers such as Nvidia and Qualcomm, which are significantly more expensive than their Chinese counterparts. With the introduction of subsidies for domestically produced chips, costs are expected to decrease, while also enhancing the autonomy of Taiwan's drone supply chain.

Taiwan's IC design industry ranks second globally, behind only the United States. According to estimates, three Taiwanese companies were among the world's top 10 IC design firms in 2024, with MediaTek—the leading Taiwanese company—ranked fifth. However, according to stakeholders familiar with these R&D programs, the firms—despite acknowledging their technical capability to design such chips—have shown reluctance to pursue development because of limits of domestic market demand.

According to a stakeholder familiar with the design of these R&D

programs, interviewed in December 2024, “It’s not cost-efficient for IC designers to invest heavily in R&D for these chips if the demand is only domestic. These companies typically operate at a sales scale of hundreds of thousands to millions of chips per product line, whereas Taiwan’s annual drone production amounts to only a few thousand units at most.”

However, subsidies rolled out by the Taiwanese government, along with the global growth of the drone and robotics markets, may help facilitate greater involvement from IC design companies, as many chips are interchangeable across both applications. In December 2024, stakeholders emphasized that AI image sensor modules and flight control systems should be prioritized for Taiwan’s drone industry. A new subsidy program, launched in January 2025 by the Ministry of Economic Affairs (MOEA), allocates NT$110 million (US$3.38 million) to support selected IC design companies. According to DSET interviews, as of May 2025, the program remains in the applicant review stage. However, many IC design firms have already expressed interest in participating.

(2) Need for Integrated Subsidy Strategy

As laid out in the previous sections, despite the government’s pledge to prioritize the “Three Chips and Two Systems,” as of 2025, only the drone AI image sensor module and the flight control module have been specifically prioritized and allocated dedicated subsidy programs. The other chips, systems, and components fall under more general subsidy schemes, making it difficult for the industry and the public to assess progress.

In addition to existing projects, leading drone manufacturers and stakeholders told DSET that “modularization and standardization to support mass production,” which the government has outlined as part of its future plans, are also critical for the development of Taiwan’s drone industry.“Standardizing and specifying components such as frames, blades, motors, batteries, and chassis, along with adopting automated production, could significantly reduce manufacturing costs and enhance competitiveness with China,” said a stakeholder familiar with the government’s R&D subsidy design. However, the Taiwanese government has yet to introduce a dedicated subsidy program to support this initiative. The stakeholder noted that limited production volumes currently reduce the need for automation, but this demand will likely grow as orders increase.

(3) Key Component Bottlenecks Remain

According to DSET’s interviews with industry stakeholders, despite ongoing government efforts to advance domestic chip fabrication and software development, Taiwan’s UAV industry remains dependent

on foreign-controlled choke points across three critical areas—two dominated by China and one restricted by U.S. export controls.

- **Battery Cells and Cathode Materials:** While Taiwan possesses strong capabilities in UAV battery module production—currently one of the country's leading drone component exports—the supply of battery cells and cathode minerals remains heavily reliant on China. The core raw materials and midstream cell manufacturing are still dominated by Chinese suppliers, posing a strategic bottleneck.

- **Rare-Earth Magnetic Components:** High-performance drone motors depend on neodymium-iron-boron magnets, for which China controls over 85% of global processing and 90% of magnet production. This exposes Taiwan to significant geopolitical risk. Industry experts have suggested that China Steel Corporation could lead the development of localized magnet production, though this would require major investment and government support to secure upstream feedstocks.

- **Thermal-Imaging Modules:** Defense-grade thermal sensors (≥640×480 resolution) are regulated under U.S. ITAR controls and dominated by firms like Teledyne FLIR. Taiwanese companies can produce optical components but lack the capacity to meet military-grade specifications. This limits both self-sufficiency and Taiwan's ability to export fully indigenous UAV platforms.

2.6.3 Strategy III: Industrial Cluster and Ecosystem Formation

- **2.6.3.1 Objective:**

The third strategy focuses on building an industrial cluster centered in Chiayi County, a region in southern Taiwan. The county is actively working to expand its emerging technology sector through efforts such as attracting TSMC's CoWoS facilities and offering subsidies to drone manufacturers.

According to the Executive Yuan, *"The Asia UAV AI Innovation Application Center (Asia UAV Center) in Chiayi has already become an important hub for Taiwan's drone industry, with a strong existing foundation. The MOEA and Chiayi County Government are currently planning the establishment of a second facility for the Asia UAV Center, which, together with the Minxiong Aerospace Park, will form a critical base for research and development, testing, manufacturing, innovative applications, and international collaboration—positioning Chiayi as a key center for the development of Taiwan's drone industry."*

- **2.6.3.2 Progress :**

According to the Chiayi County Government and the Asia UAV

Innovation Center, Taiwan's government aims to establish a vertically integrated ("end-to-end") drone supply chain centered in Chiayi, a county in southern Taiwan, traditionally known for its agriculture and tourism industries, and in recent years has focused on developing the drone and aerospace sectors. This strategy involves creating one R&D base and one manufacturing hub, supported by a dedicated test flight zone and a nearby science park to attract component suppliers and application developers.

Specifically, the **Asia UAV AI Innovation Application R&D Center** serves as the lead R&D base. Established in 2022 and covering 10 hectares (approx. 25 acres), the center includes an administrative building and adjacent flight testing grounds. It currently hosts over 50 entities spanning industry, government, academia, and research, with major UAV companies operating offices on site. The government is currently constructing a second phase of similar size.

The **Minxiong Aerospace Park**, focused on drone manufacturing, broke ground in 2023 and spans 25 hectares (61.78 acres). The park is funded by the Ministry of National Defense and will be managed by the National Chung-Shan Institute of Science and Technology (NCSIST). The eastern section will house NCSIST's military-grade UAV production lines, expected to begin operation in 2026. The western section, designated as the "Minxiong Aerospace and UAV Industrial Park," will host private-sector manufacturers. The park is expected to employ 150–200 engineers by 2025. Over 20 domestic and international companies have already expressed interest in setting up operations.

A large-scale UAV test site was originally planned in **Yizhu Township**, featuring a 600–800 meter runway for unrestricted flight toward the Taiwan Strait. However, as of May 2025, the plan was revised after government evaluations found that existing sites like Shuishang and Hengchun airports could meet testing needs. The Ministry of National Defense is now leading further site assessments.

Finally, the neighboring **Chiayi Science Park**, still in development, will focus on emerging industries such as unmanned systems, smart agriculture, and precision health, further supporting upstream suppliers within the UAV ecosystem.

Table 7: Progress in Developing a Drone Industry Cluster

Year	Milestone
2022	Asia UAV Center inaugurated
2022-2024	Asia UAV Center achieves over 90% utilization; hosts more than 50 entities
2023	Construction begins on Minxiong Aerospace Park (Eastern Campus)
2024	Planning initiated for Phase II (second building) of Asia UAV Center
2026	Minxiong Eastern Campus enters operation for NCSIST's military-grade UAV production
2028	Full completion of Minxiong Aerospace and UAV Industrial Park expected

- **2.6.3.3 Challenges:**

Two major challenges facing the cluster-building efforts are:

(1) The current dispersion of UAV production sites, which makes it difficult to consolidate the supply chain ; (2) Opposition parties' boycott of the drone industrial park budget.

(1) Dispersed UAV Manufacturing Base

Since the establishment of the Asia UAV Center, most leading drone manufacturers have set up offices at the center. However, as the Center is positioned primarily as an R&D hub, it is not the main operational base for most companies. The headquarters and production facilities of key manufacturers remain geographically dispersed across Taiwan.

Leading drone manufacturers interviewed by DSET acknowledged that a well-developed industrial cluster could, in the long term, improve production efficiency. However, they emphasized that most companies already have established manufacturing bases across various

regions of Taiwan and are unlikely to relocate in the near term.

At present, the Asia UAV Center remains focused on R&D, while the manufacturing-oriented Minxiong Aerospace Park is not expected to be fully completed until 2028. As such, the formation of a fully integrated drone industrial cluster in the short term remains a challenge.

(2) Opposition's Budget Boycott

The establishment of a dedicated UAV industrial park has faced strong opposition from Taiwan's opposition parties. In 2024, amid a broader series of budget cuts proposed by the opposition, the 2025 fiscal budget for the Minxiong Aerospace Park was subjected to significant constraints. The opposition initially proposed a full cancellation of the NT$76.25 million (US$2.33 million) initial allocation for the first year—part of the broader NT$762.5 million (US$23.3 million) overall budget plan. This was later revised to a budget freeze, pending legislative approval of a detailed project report.

The primary rationale cited for the freeze was the NCSIST's lack of experience in managing industrial parks. In addition, the opposition argued that concentrating Taiwan's UAV industry in a single location could create a vulnerable wartime target for China. As of May 2025, the budget remains partially frozen.

資料來源：嘉義縣政府(2022)

Figure 12: Geographic Layout of Chiayi's Drone Cluster (Right to Left: Minxiong, Asia UAV Center, Yizhu Township

(Source: Chiayi County Government, 2022)

2.6.4 Strategy IV: Regulatory Framework and Cybersecurity Standardization

- **2.6.4.1 Objective:**

The fourth strategy aims to:
(1) Strengthen Taiwan's drone cybersecurity standards and align them with international benchmarks to support global market access;
(2) Reform aviation regulations to improve the testing environment for the drone industry.

According to the Executive Yuan, *"The government will continue promoting subsidies for cybersecurity testing, link domestic standards with international cybersecurity certifications, assist companies in reducing related costs, and optimize relevant measures to align with global standards, helping firms expand into international markets. In addition, the government is considering promoting a dedicated testing airspace through a sandbox mechanism to provide the industry with a more comprehensive testing environment and to accelerate the improvement of airspace management."*

The international cybersecurity certifications referenced by the government are primarily based on U.S. standards, including:

- **National Defense Authorization Act (NDAA), Section 848 and 817 (First introduced in FY 2020 and expanded in FY 2023)**
  Introduced in FY2020 and expanded in FY2023, the NDAA prohibits the U.S. Department of Defense from procuring drones or components manufactured by certain foreign entities (primarily from China), and restricts collaboration with contractors using such equipment.

- **Blue UAS Certification (Launched in 2020)**
  Launched by the Defense Innovation Unit (DIU) in 2020, the Blue UAS program certifies commercial drones for Department of Defense use based on cybersecurity, supply chain integrity, and regulatory compliance, ensuring they meet NDAA requirements.

- **Green UAS Certification (Launched in 2023)**
  Developed by the Association for Uncrewed Vehicle Systems International (AUVSI), Green UAS builds on Blue UAS standards but is tailored for non-DoD users such as local governments and utilities. It adds evaluation of corporate cybersecurity governance, remote operation safety, and supply chain risk management.

- **Cybersecurity Maturity Model Certification (CMMC) (First introduced in 2020, revised as CMMC 2.0 in 2021)**
  Created by the U.S. Department of Defense, CMMC is a cybersecurity framework for defense contractors, consisting of three maturity levels to ensure adequate protection of sensitive data such as Controlled Unclassified Information (CUI).

- **2.6.4.2 Progress**

(1) Progress on Cybersecurity Standardization

To support Taiwanese drone manufacturers in entering the U.S. market, the Taiwanese government has actively promoted the development of domestic cybersecurity infrastructure. Key initiatives include the establishment of testing laboratories, the creation of drone-specific cybersecurity standards, and the implementation of training programs aligned with U.S. regulations. These efforts aim to support Taiwanese companies in meeting U.S. cybersecurity requirements, though substantial progress has yet to be realized.

In 2023, the Ministry of Digital Affairs (MODA) supported the launch of the Joint Cybersecurity Testing Laboratory for Drones, led by a consortium of private cybersecurity firms. By 2024, the laboratory had assisted 13 Taiwanese drone companies in certifying a total of 22 drone models through product-level security testing. In the same year, Taiwan amended its domestic regulations to mandate that all drones manufactured and sold locally must pass cybersecurity testing, thereby establishing a national cybersecurity baseline for the drone industry. Concurrently, MODA has introduced subsidy programs for cybersecurity testing to alleviate the certification costs borne by drone manufacturers.

Despite these advancements, as of May 2025, no Taiwanese drone manufacturer has been included in the U.S. DoD's Blue UAS Cleared List or the industry-led Green UAS list, although several companies have publicly stated they are preparing to apply. As of May 2025, the Blue UAS Cleared List includes 13 certified vendors, mostly U.S.-based, with Parrot (France) as the sole foreign company.

Since its launch in 2020, the Blue UAS program has steadily expanded. The most recent expansion, announced by the U.S. DoD in February 2025, added 23 new drone platforms and 14 new components, which are currently undergoing final cybersecurity and supply chain validation. While most of these platforms are U.S.-made, the cohort also includes systems from Quantum Systems (Germany) and Skyfall (Ukraine), signaling a gradual broadening of the program's international scope.

To further its support, in March 2025, the Ministry of Digital Affairs announced a new strategy to enhance CMMC (Cybersecurity Maturity Model Certification) training in Taiwan, in preparation for updated U.S. requirements set to take effect in June 2025. The Ministry also revealed plans to apply—between 2025 and 2026—for the establishment of a CMMC Third-Party Assessor

Organization (C3PAO) in Taiwan. The goal is to enable local certification, thereby reducing the time and cost for Taiwanese companies to achieve U.S.-compliant cybersecurity validation.

The U.S. government is also promoting third-party localized testing sites. On May 16, 2025, the U.S. Department of Defense's Defense Innovation Unit (DIU) announced that it will begin allowing third-party assessments for NDAA compliance starting in June 2025, with a solicitation for assessor organizations expected that same month. DIU also stated that it will leverage the AUVSI Green UAS program to support compliance for the Blue UAS Cleared List. However, there is no indication that Taiwan will be included in the initial batch of such approvals.

(2) Progress on the Testing Environment

The persistent shortage of suitable testing airspace remains a major constraint for Taiwan's UAV industry. According to stakeholder interviews conducted by DSET, as of 2025, leading UAV manufacturers consistently report difficulties related to limited access to test flight zones.

This constraint is particularly acute along Taiwan's western coastline—an area of strategic importance in the event of a Taiwan Strait contingency—where dense clusters of airports, military facilities, and training zones have resulted in extensive flight restrictions. Despite a series of regulatory reforms introduced since 2020, these airspace limitations continue to impede industry development.

Following the promulgation of a dedicated chapter on UAVs in the Civil Aviation Act on March 31, 2020, Taiwan implemented a four-tiered, color-coded airspace classification system:

- **Red Zones:** Strict no-fly areas
- **Yellow Zones:** Altitude-restricted zones (typically capped at 60 meters)
- **Green Zones:** Permitted operational zones (up to 120 meters), managed by local governments
- **Gray Zones:** Jurisdictions under the authority of designated agencies (e.g., national parks, commercial ports)

Figure 13: Four-Tier Color-Coded Airspace Classification for UAV Operations

In practice, implementation has been highly restrictive. Local governments, taking a conservative approach, have designated vast areas as restricted or prohibited for drone operations. As of June 2024, the Civil Aeronautics Administration (CAA) had designated 76 restricted zones, while local governments had declared an additional 4,241 zones. UAV operations in these areas require prior approval from either the CAA or relevant local authorities. The approval process is widely viewed as complex, fragmented, and time-consuming—particularly for missions involving long-range, maritime, or high-altitude testing.

Policy Initiatives and Sandbox Mechanism To improve regulatory flexibility and support R&D, the government enacted the *Unmanned Vehicles Scientific and Technological Innovation Experiments Act*, creating a UAV testing "sandbox" framework. This mechanism allows selected research projects to conduct test flights under predefined exemptions from standard regulatory requirements. As of the end of 2024, 21 sandbox projects had been approved.

In parallel, the Ministry of Economic Affairs is overseeing the development of a 60-hectare UAV testing facility in Yizhu Township, Chiayi County. The site is expected to provide essential infrastructure for testing medium and large UAVs, addressing long-standing gaps in Taiwan's UAV development ecosystem. However, in May, County Magistrate Weng Chang-liang clarified that due to the high costs and manpower required, the central government is prioritizing existing airports and has identified three to four potential sites. Instead of selecting Yizhu, Chiayi County is actively

advocating for Shuishang Airport to be included as a drone test site.

- **2.6.4.3 Challenges**

(1) Cybersecurity:

Despite support and subsidies from the Taiwanese government, no Taiwanese companies have formally applied for or been listed on the Blue UAS or Green UAS platforms. According to interviews conducted by DSET with leading manufacturers and stakeholders, high participation costs and the lack of local third-party certification bodies remain key barriers to entry.

In addition to product-level cybersecurity standards, UAV manufacturers are also subject to security requirements under frameworks such as CMMC, Blue UAS, and Green UAS. However, growing cyber threats from Chinese actors have intensified this challenge. According to cybersecurity company reports, since 2023, Chinese hacking groups have repeatedly targeted Taiwanese drone companies to steal sensitive information. Notably, the group Earth Ammit launched two major campaigns—VENOM and TIDrone—targeting software providers and military UAV manufacturers. Both Taiwanese and South Korean firms using the same ERP system were affected, indicating a compromised software supply chain.

(2) Testing Environment:

Industry stakeholders continue to cite the limited availability of designated test zones, rigid zoning regulations, overlapping authority among agencies, and lengthy approval timelines. These challenges collectively constrain innovation and delay product validation.

2.6.5 Strategy V: Enhancement of Defense Resilience

- **2.6.5.1 Objective:**

The fifth strategy is closely related to the first strategy on stimulating domestic demand, emphasizing the Taiwanese government's efforts to expand drone procurement in areas such as national defense, disaster response, and public safety. It also underscores the importance of enhancing the capacity of various government agencies in drone applications.

According to the Executive Yuan, *"The fifth initiative recognizes the multifaceted value of drones in both commercial and public sectors, particularly in national defense and disaster prevention. The government anticipates that future procurement of drones for public use, as well as the development of various civilian drone applications, will not only drive industrial growth but also reinforce the four pillars of resilience outlined by President Lai: national defense, public welfare, disaster prevention, and democratic integrity."*

- **2.6.5.2 Progress:**

As described in Strategy I, the most substantial government procurement cases include:

Ministry of National Defense Procurement (2024–2028): A total budget of NT$6.8 billion (approx. US$ 212.5 million) has been allocated to procure 3,422 domestically produced commercial-grade drones for military use by Taiwan's armed forces.

Coast Guard Administration (Procurement began in 2018, expansion signaled in 2025):

In 2018, 20 drones were procured for NT$90 million (approx. US$ 2.81 million);

In 2019, the agency estimated that NT$5 billion (approx. US$ 156.25 million) would be needed to strengthen its drone fleet.

In May 2025, the Coast Guard indicated plans to launch the second and third phases of its drone procurement program.

National Fire Agency (2024–2025):

In 2024, the agency invested NT$660 million (approx. US$ 20.63 million) to procure 88 infrared thermal imaging drones and 88 rescue robots for disaster response. An additional NT$400 million (US$ 12.5 million) is expected in 2025 for drone and rescue robot procurement.

An additional NT$280 million (approx. US$ 8.75 million) budget (2022–2029) has been allocated to subsidize local governments in the procurement of 366 drones

for disaster response, disbursed over multiple fiscal years.

National Police Agency Drone Procurement:

Since 2020, the National Police Agency has steadily expanded its drone fleet; however, comprehensive public statistics on total procurement quantities remain unavailable.

Under the leadership of the Executive Yuan's UAV Task Force, the government continues to mandate increased drone procurement across agencies. In May 2025, it launched a centrally coordinated initiative to acquire at least 47,000 drones over a three-year period.

- **2.6.5.3 Challenges**

As outlined in the domestic market challenges under Strategy I, several structural barriers continue to hinder the expansion of government UAV procurement. These include: (1) gaps in strategic procurement planning across agencies, resulting in fragmented and uncoordinated demand; (2) budget obstruction from opposition parties, including efforts to cancel major allocations for defense resilience; (3) higher unit costs of Taiwanese UAVs compared to Chinese models, which place additional strain on limited public-sector budgets; and (4) growing competition from other non-Red foreign suppliers, such as U.S.-based Skydio, which has been selected as a supplier for Taiwan's National Fire Agency. (See: 2.4.1.3 Strategy I – Challenges)

2.7 Policy Recommendations

2.7.1 Strategy I: Market Expansion Through Domestic and International Demand & Strategy V: Enhancement of Defense Resilience

Domestic Market Expansion

Challenge 1: Taiwan Needs a More Integrated National UAV Procurement Plan for Local Commercial-Grade Systems

- Taiwan's UAV procurement planning across civilian ministries and military branches remains in its early stages and provides limited visibility into long-term requirements such as platform types, quantities, and mission-specific applications across agencies.
- Procurement remains reactive and fragmented, particularly among high-use civilian agencies such as police, fire departments, and the coast guard.

Recommendation 1: Strengthen Procurement Planning and U.S.–Taiwan Experience Sharing

For Taiwan:

The Ministry of National Defense should:

- Build upon the existing 2024–2028 commercial-grade UAV acquisition plan to develop a long-term, cross-service procurement roadmap that clearly outlines aircraft types, mission roles, and required quantities.
- Use the U.S. Department of Defense's *Unmanned Systems Integrated Roadmap 2017–2042* as a reference model.

The Executive Yuan's UAV/ USV Task Force should:

- Move beyond a bottom-up approach where local police and fire departments individually submit procurement requests.
- Instead, the central government should study international use cases of UAV deployment in law enforcement, fire and rescue, and coast guard operations to lead centralized planning for high-demand civilian agencies.

For the United States:

The Department of Defense, particularly the DIU, should:

- Share experience with Taiwan's Ministry of National Defense regarding UAV acquisition strategies and implementation of the Blue UAS program.
- Support Taiwan in developing its own procurement roadmap

and help strengthen a shared U.S.–Taiwan operational vision for strategic UAV cooperation.

The U.S. government should:

- Facilitate exchanges on UAV applications in public safety (e.g., law enforcement, emergency response).
- Leverage the Global Cooperation and Training Framework (GCTF)—which includes Taiwan, the U.S., Japan, Australia, and Canada, and currently covers areas such as law enforcement, disaster relief, and cybersecurity—as a platform to:
  - Provide UAV training and information-sharing for law enforcement and emergency responders, including best practices in operational deployment, procurement models, specification setting, and acquisition procedures.
  - Deepen bilateral and multilateral cooperation on UAV operational standards and deployment models.

Challenge 2: Barriers to Taiwan's UAV Procurement: Limited Budgets, High Unit Costs, and Non-Red Competitors

- Taiwan's "China-free" UAV policy has increased costs and strained public-sector budgets, while a NT$150 billion (US$4.6 billion) defense package, proposed in April 2025—including investments in the UAV industry—faces political opposition. At the same time, local firms face rising competition from other non-Red foreign suppliers.

Recommendation 2: Expand Budgetary Support and Reduce Tariff Pressures

For Taiwan:

- Increase UAV procurement budgets to accelerate the development of a China-free UAV supply chain.
- Political parties should acknowledge that Taiwanese drone and component exports to the U.S.—which have seen modest growth over the past two years—remain challenged by tariff barriers and require corresponding industrial support.
- When procuring foreign-made non-Red UAVs, public-sector agencies should also expand purchases of competitively priced and similarly capable Taiwan-made drones.

For the United States:

- In defense budget discussions with Taiwan—including proposals to raise spending to a certain percentage of GDP—the U.S. should recognize UAV investment as a core component of Taiwan's wartime resilience strategy.

U.S. Market Expansion

Challenge 3: Limited U.S. Government Procurement Access

- Despite growing exports, Taiwanese UAVs remain absent from U.S. federal procurement channels, with no firms listed on Blue or Green UAS programs as of May 2025.

Recommendations 3: Strengthen U.S. Market Access Through Federal Certification and Local-Level Engagement

For Taiwan and the United States:

- **Local Government Level:** Leverage Taiwan's existing export experience in supplying UAVs for public security applications to encourage U.S. police, fire, and emergency response agencies to consider competitively priced, high-performance Taiwanese drones.
- **Federal Government Level:** Prioritize U.S.–Taiwan cooperation to support Taiwanese UAV manufacturers in applying for **Blue UAS** and **Green UAS** certifications, in order to facilitate future procurement by U.S. federal agencies.

Challenge 4: Initial U.S.–Taiwan Industry Coordination Has Yet to Translate into UAV Exports

- U.S.–Taiwan UAV industry engagement expanded after the September 2024 delegation visit, yielding subsystem-level cooperation but not yet resulting in substantial UAV exports.

Recommendation 4: Leverage and Expand Existing Taiwan–U.S. Drone Partnership Models

For Taiwan and the United States:

- Build on ongoing US-Taiwan drone cooperation—using successful cases like Coretronic and Teledyne FLIR—to promote broader industrial collaboration through joint manufacturing and ODM-based partnerships.

Challenge 5 : Tariff Pressures Under the Trump Administration

- The Trump administration's April 2025 tariff policy threatens Taiwan's UAV and component exports; some firms have begun U.S.-based investment, potentially weakening efforts to build a domestic wartime supply chain.

Recommendation 5: Exempt Tariffs on Taiwanese UAVs and Components

For the United States:

- The U.S. should exempt Taiwanese drones and key components from tariffs to preserve bilateral UAV supply chain cooperation and prevent harm to Taiwan's emerging drone industry.

EU Market Expansion

Challenge 6: Missed Opportunities in Europe Due to Production and Compliance Constraints

- Taiwan's UAV exports to Europe have grown rapidly since 2023, with shipments reaching nearly 3,000 units in Q1 2025—mainly to Poland, Germany, and the Czech Republic. However, large-volume inquiries linked to Ukraine remain unconverted due to limited production capacity, uncertain demand, and end-user verification challenges.

Recommendation 6: Strengthen U.S.–Taiwan Coordination on End-User Verification and Export Compliance

For Taiwan and the United States:

- In response to the surge in inquiries likely driven by Ukraine-related demand, U.S. and Taiwanese trade authorities should establish a shared list of verified buyers and grant access to Taiwanese UAV manufacturers to reduce the risks associated with unverified brokers.
- To help Taiwanese companies navigate export control regulations and Know Your Customer (KYC) requirements, both governments should jointly support enhanced training programs, provide compliance resources, and facilitate information-sharing platforms to strengthen the industry's due diligence capabilities.

2.7.2 Strategy II: Technology Development and International Collaboration

Challenge 7: High Dependency on Foreign Chips and Limited Local IC Designer Engagement

- Despite government prioritization of the "Three Chips and Two Software," Taiwan remains reliant on costly foreign suppliers, as limited domestic demand and broad, unfocused subsidies have deterred local IC designers from investing in drone-specific chip development.

Recommendation 7: Integrate Existing Chip Subsidies to Support Market-Driven, Dual-Use Drone/ Robotics IC Development

For Taiwan:

- The Taiwanese government should enhance subsidy planning and timelines for each component of the "Three Chips and Two Software" initiative.
- It should also strategically integrate subsidy programs across agencies to support the development of interchangeable chips for drones and robotics. According to industry

stakeholders, growing global demand for robotics and UAV chips has increased interest among Taiwan's IC design firms in investing in drone-related R&D.

Challenge 8: Supply Chain Bottlenecks Restricted by Chinese Dominance and U.S. Export Controls

- Taiwan faces unresolved supply chain bottlenecks—current subsidies have not addressed its heavy reliance on Chinese sources for batteries and rare-earth magnets, or its limited access to thermal imaging modules restricted by U.S. ITAR controls.

Recommendation 8:

For Taiwan and the United States:

- The two countries should jointly identify UAV supply chain choke points and coordinate on securing sources for rare earths and battery cells currently dominated by China.

2.7.3 Strategy III: Industrial Cluster and Ecosystem Formation

Challenges 9: Dispersed UAV Production Limits Cluster Formation

- UAV production in Taiwan remains geographically fragmented, hindering clustering and vertical integration. Opposition parties have objected to the science park budget, citing the Ministry of National Defense's lack of industrial park management experience and concerns that concentrated UAV clusters could become wartime targets.

Recommendation 9: Promote Cluster Efficiency While Preserving Distributed Production for Wartime Resilience

For Taiwan:

- To incentivize industry relocation, the government should offer clear incentives—such as land, tax, and regulatory benefits—to attract UAV supply chain firms into designated industrial parks.
- While promoting early-stage production efficiency through clustering, the government should also preserve Taiwan's decentralized industrial structure to maintain wartime resilience.

2.7.4 Strategy IV: Regulatory Framework and Cybersecurity Standardization

Challenge 10: Gaps in Cybersecurity Compliance and Testing Infrastructure

- Cybersecurity: Despite government support, no Taiwanese UAV firms are listed on the U.S. Blue UAS (DoD-led) or Green UAS (industry-led) platforms, with manufacturers citing high certification costs

and the lack of local third-party validators as key barriers—challenges further compounded by escalating cyberattacks from Chinese threat actors targeting UAV producers. In May 2025, the DIU announced that it will begin allowing third-party assessments for NDAA compliance starting in June 2025, but the Taiwanese government has not indicated whether it will apply.

- Testing Environment: Innovation and product validation are hindered by a lack of permanent UAV test zones, rigid airspace regulations, fragmented oversight, and slow approval processes.

For Taiwan:

- Cybersecurity: Taiwan should seek to establish certified third-party assessment centers for both Blue UAS and Green UAS domestically, and expand cybersecurity subsidies to support local UAV manufacturers' participation in these certification programs.
- Testing Environment: Establish a permanent long-range flight corridor on the East Coast, especially for long-range drones procured by the Ministry of National Defense; Expand and integrate wind tunnel facilities across government agencies for use by domestic UAV manufacturers; Use government procurement or subsidies to support local UAV companies in conducting test flights in third countries.

Chapter 3

Strategic Scenarios and Realignment

Taiwan’s UAV Industry Under U.S. Policy Shifts

Executive Summary

Taiwan's UAV industrial strategy is entering a pivotal phase. While domestic production and institutional alignment have accelerated since 2020, Taiwan's ability to scale and globalize its UAV sector will depend heavily on its capacity to **move beyond subsystem integration and establish a formal role** in the U.S.-led defense-industrial ecosystem. This chapter focuses exclusively on military-grade UAVs acquired through U.S. defense channels, including Group 3–5 platforms such as MQ-9B, ALTIUS, and Switchblade.

The analysis begins from these existing procurements and explores how Taiwan can **localize final assembly, establish sustainment infrastructure, and co-develop subsystems** under a more institutionalized U.S.–Taiwan defense-industrial partnership. It emphasizes that while Taiwan already contributes cost-effective components, its exclusion from certification systems (e.g., Blue UAS), lack of FACO designation, and absence of a co-design mechanism limit its ability to scale.

This chapter applies a three-scenario framework to identify strategic choices Taiwan must make as it seeks to embed within the democratic drone supply chain: Incremental Integration, Institutionalized Partnership, and Fallback Autonomy.

The analysis draws on historical U.S.–Taiwan co-production precedents—such as the IDF, F-16V, and submarine programs—and outlines key industrial, regulatory, and strategic constraints facing Taiwan's UAV ambitions. It also incorporates the lessons of recent allied models, including Japan's F-35 FACO and South Korea's 2025 Hanwha–GA-ASI co-development agreement. Building on this, the chapter proposes five targeted policy recommendations across three domains to operationalize

co-production, modular integration, and scenario-responsive planning.

This roadmap supports two strategic imperatives:

(1) Embedding Taiwan as a trusted contributor to the democratic UAV supply chain; and

(2) Enhancing national resilience through certification alignment, subsystem innovation, and bilateral interoperability.

Strategic Trajectories and Policy Challenges

Scenario I: Incremental Integration

Taiwan scales domestic production and aligns with allied standards but remains structurally dependent on U.S. permissions. Vulnerable to political shifts and export constraints.

Scenario II: Institutionalized Partnership

Taiwan becomes a trusted subsystem co-developer and FACO site within the U.S.-led ecosystem. Realizes ODM/OEM potential but requires IP protections, certification reform, and a formal coordination mechanism such as TEDIBOA.

Scenario III: Fallback Autonomy

Taiwan accelerates domestic R&D amid U.S. disengagement. Gains sovereignty but at higher cost, slower scale, and reduced international competitiveness.

Policy Domains and Recommendations

Policy Domain I: Institutional Co-Production and Certification Alignment

- Establish a Taiwan–U.S. Drone Co-Production Working Group to coordinate subsystem development, compliance, and Blue UAS alignment.
- Create joint certification and export fast-track pathways modeled on NATO precedents and backed by domestic sandbox testing and assessment centers.

Policy Domain II: Modular and Distributed Production

- Designate Taiwan as a regional final assembly and sustainment hub for U.S.-origin systems, with embedded cybersecurity and configuration roles.

- Expand TEDIBOA's mandate as the official industrial coordination body to serve as a structured interface for Blue UAS, Green UAS, and NATO certification, export coordination, and component vetting.

Policy Domain III: Scenario-Responsive Policy Planning

- Codify Taiwan's priority role in a China-free drone supply chain under U.S. law (e.g., NDAA amendments, SOSA eligibility).

- Align domestic R&D and procurement tracks with each of the three strategic trajectories to ensure flexibility amid evolving U.S. policy.

Strategic Outlook

Taiwan must hedge between dependence and autonomy by embedding into trusted international frameworks while preserving sovereign production capacity. **Subsystem integration is no longer sufficient**—co-production, modular certification, and institutional alignment are essential to long-term viability. With congressional interest rising and China-free procurement becoming a shared strategic goal, Taiwan must act swiftly to institutionalize its role before windows of opportunity close.

This chapter focuses on Taiwan's strategic challenge of localizing military-grade UAVs already acquired from the United States—such as the MQ-9B Sea Guardian, ALTIUS 600M-V, and Switchblade 300. Unlike Chapter 2, which centers on Taiwan's domestic efforts to export commercial and dual-use UAVs to the U.S. market, this chapter begins from the reverse direction: examining how Taiwan can deepen its defense-industrial integration by transitioning from a platform importer to a trusted co-producer and final assembler of military UAVs. The core question is how to institutionalize U.S.–Taiwan co-production, certification, and sustainment arrangements for systems already being procured under Foreign Military Sales (FMS) and Presidential Drawdown Authority (PDA). As U.S. defense policy evolves and Taiwan's operational requirements grow, securing a scalable and politically resilient framework for military UAV collaboration has become a critical objective.

3.1 Taiwan's UAV Industry in a Shifting Strategic Landscape

Taiwan's UAV sector stands at a strategic crossroads. While the country has made significant progress in scaling drone production and expanding its industrial base, its long-term trajectory remains heavily influenced by external forces—particularly the evolving threat posed by China and shifting U.S. defense policy under changing administrations. China's aggressive military posture, rapid drone modernization, and coercive trade tactics have made secure drone production a matter of national security. Taiwan's pursuit of UAV self-reliance—through initiatives like TEDIBOA and the Five Trust Industries framework—reflects a broader strategic priority to reduce dependence on adversarial supply chains and increase survivability in a cross-Strait conflict. This section focuses on the defense-industrial dimension of Taiwan's UAV strategy—specifically, the military-grade systems already procured from the United States under FMS and PDA programs.

However, sustaining this progress will require deeper integration into international technology and investment flows, particularly those governed by the U.S.. As the primary source of military-grade systems, ISR payloads, and secure communication modules, the U.S. remains Taiwan's most critical enabler of deterrence, defense resilience, and technological sovereignty. Yet, this dependency is complicated by mounting uncertainty in U.S. defense policy. With a second Trump administration—and the resurgence of an "America First" approach—Taiwan's forward-facing drone strategy may face headwinds ranging from export controls to co-production roadblocks. While the Biden administration promoted multilateral cooperation and industrial

partnerships with Indo-Pacific allies, the Trump-era legacy of transactional diplomacy, tightened trade enforcement, and erratic bilateral signaling remains fresh in the minds of both policymakers and industry leaders. In stakeholder interviews, concerns were raised that a return to Trump-era defense posture could deprioritize Taiwan or reintroduce obstacles to drone technology transfer. Others noted that Taiwan's drone ambitions—particularly its goal of becoming a trusted ODM/OEM supplier—require stable, rules-based engagement with U.S. defense and industrial counterparts.

At the same time, Taiwan is vulnerable to non-political constraints embedded in U.S. law—such as ITAR export restrictions, Buy American provisions Act, and bureaucratic fragmentation across DoD, Department of State (DoS), and DoC. These structural frictions persist regardless of party affiliation and complicate Taiwan's integration into the U.S.-led drone ecosystems. As Taiwan scales up its UAV ecosystem and positions itself as a hub for the democratic drone supply chain, it must contend not only with domestic production gaps, but also with volatile access to its primary partner.

While Taiwan has made significant strides in aligning its UAV doctrine and industrial capacity with those of its democratic partners, major uncertainties remain—particularly regarding U.S. defense policy, export control regimes, and long-term industrial trust. Despite progress in procurement and production, Taiwan's future role in the global drone ecosystem is not guaranteed. The gap between stated U.S. support and formal co-production arrangements leaves Taiwan vulnerable to strategic ambiguity, market exclusion, and redundancy.

Taiwan's UAV future hinges not only on its own industrial execution, but on the direction and durability of U.S. defense and technology policy. This chapter maps out three possible strategic trajectories—each shaped by different levels of U.S. engagement and institutional alignment:

Scenario 1: Incremental Integration

Taiwan gradually expands domestic capacity and aligns with allied standards, but remains structurally dependent on U.S. permissions and lacks access to co-production or certification frameworks.

Scenario 2: Institutionalized Partnership

Taiwan becomes a trusted co-developer in a democratic drone ecosystem through joint certification, subsystem integration, and a formal bilateral co-production mechanism.

Scenario 3: Fallback Autonomy

In the face of U.S. disengagement or tightened export restrictions, Taiwan accelerates full-spectrum

domestic development—at higher cost, slower scale, and with reduced interoperability.

These scenarios offer distinct implications for Taiwan's defense resilience, industrial growth, and international positioning. Before analyzing them in depth, the next section examines historical precedents in U.S.–Taiwan defense-industrial collaboration—and what lessons they offer for the path ahead. The remainder of this chapter examines how Taiwan can move beyond procurement toward co-production and certification of these military UAV platforms, using a scenario-based framework.

3.2 Foundations of Taiwan–U.S. Defense Collaboration

Before examining Taiwan's UAV future, it is essential to understand how past defense-industrial programs have navigated export controls, co-production barriers, and political sensitivities in the U.S.–Taiwan relationship. These precedents offer valuable lessons—and cautionary tales—for today's drone collaboration prospects.

A review of Taiwan's major co-development efforts—including the Indigenous Defense Fighter (IDF), the F-16V upgrade, and the Indigenous Defense Submarine (IDS) program—reveals both the possibilities and constraints of the U.S.–Taiwan industrial cooperation. Together, they show how Taiwan has adapted to shifting U.S. policies while pursuing long-term defense self-reliance, and why continuity, trust, and alignment will be essential in shaping the next phase of UAV integration.

Indigenous Defense Fighter (IDF) Program

Launched in the 1980s, the IDF program exemplifies early **subsystem-level cooperation** between Taiwan and U.S. defense firms, at a time when direct arms sales were constrained by U.S.–China normalization. While the U.S. government barred Taiwan's acquisition of the F-16 and F-20, it permitted unrestricted technical assistance, allowing Taiwanese agencies and AIDC to engage with U.S. companies—including General Dynamics, Hughes, Westinghouse, and AlliedSignal—on airframe design, radar, avionics, and propulsion. The IDF incorporated several U.S.-derived subsystems and design features, but overall development, integration, and final assembly were led and

executed in Taiwan. Though politically sensitive and expensive, the program demonstrated Taiwan's capacity to absorb foreign technology inputs, manage subsystem integration, and deliver a frontline-capable platform under constrained conditions.

F-16 Block 70/72 (F-16V) Upgrade Program

Taiwan's F-16A/B fleet underwent a major upgrade to the F-16 Block 70/72 standard beginning in 2011. The program was structured as a **U.S.-led retrofit** under the Foreign Military Sales (FMS) process, with upgrade kits and systems delivered by Lockheed Martin. Taiwan's role centered on **localized installation, sustainment, and logistics support**—demonstrating its capacity to perform **maintenance-level cooperation** on advanced U.S. platforms. However, the absence of licensed production rights or meaningful subsystem integration limited the opportunity for industrial spillover. The program underscored the importance of planning for technology transfer and long-term sustainment readiness from the outset.

Indigenous Defense Submarine (IDS) Program

Launched in the late 2010s after decades of unsuccessful foreign procurement attempts, The IDS program marks **Taiwan's first modern co-production effort** involving U.S. and allied support. While the program is officially presented as an indigenous initiative, multiple credible sources—such as Naval News (2023)—confirm that **U.S. and European contractors are supplying advanced subsystems**, including sonar systems, combat management suites, and periscope components. Taiwan's domestic industry, led by CSBC Corporation and NCSIST, is responsible for platform design, assembly, and integration. Although conducted under diplomatic ambiguity, the IDS program demonstrates Taiwan's growing ability to coordinate sensitive international contributions, integrate advanced foreign subsystems, and deliver a domestically assembled platform—**fulfilling key operational needs despite persistent export restrictions**.

Taken together, these case studies illustrate Taiwan's strategic agility in adapting to U.S. policy constraints while incrementally advancing its defense-industrial capabilities. From **maintenance-level support** (F-16V), to **subsystem integration** (IDF), to **limited co-production under diplomatic ambiguity** (IDS), each case reflects Taiwan's effort to move up the cooperation ladder—

often without formal structures or long-term guarantees.

However, they also underscore key risks that continue to shape Taiwan's defense-industrial future:

- Lack of formal co-production authority limits industrial scaling
- Ad hoc or politically fragile arrangements risk reversal during leadership transitions
- Insufficient integration planning leads to minimal spillover into Taiwan's civilian industrial base

These lessons are directly relevant to Taiwan's current UAV strategy. As the country seeks to transition from basic platform assembly to **component-level integration, subsystem certification, and export readiness**, clarity and continuity in U.S.–Taiwan defense-industrial alignment will be critical.

The following section presents three potential scenarios that reflect differing trajectories of U.S. engagement and policy orientation toward Taiwan's drone ecosystem.

3.3 The Three-Scenario Framework for UAV Development

Taiwan's UAV industrial future will be shaped not only by internal policy execution, but also by the degree of strategic alignment with the U.S.. As U.S. defense policy enters a period of potential inflection—due to election outcomes, procurement reforms, and alliance recalibration—Taiwan faces three plausible paths for advancing its drone strategy. These scenarios are not mutually exclusive or deterministic. Rather, they represent a strategic spectrum of how Taiwan's UAV development might evolve, depending on the level of U.S. engagement, the availability of technology access, and the extent of bilateral coordination.

Scenario 1: Incremental Integration (Baseline Trajectory)

Under this scenario, Taiwan continues its current trajectory—scaling its domestic UAV industry, deepening participation in U.S. and Indo-Pacific supply chains, and

gradually aligning with Blue UAS and other allied technical standards.

Key features include:

- Continued FMS and limited Presidential Drawdown Authority (PDA) transfers
- Incremental engagement with U.S. drone export regulations
- Selective inclusion of Taiwanese suppliers into low-risk components of U.S. programs

In this scenario, Taiwan's integration is real but incomplete. Industrial autonomy improves slowly, but high-end components remain U.S.-controlled, and Taiwan's defense industrial base remains dependent on U.S. political continuity.

Scenario 2: Institutionalized Partnership

In this higher-alignment scenario, Taiwan and the U.S. formalize co-development and co-production channels. Taiwan becomes a trusted node in a democratic drone supply chain, potentially manufacturing subsystems for U.S.-branded platforms.

Key features include:

- Strategic coordination of procurement between MOEA, MND, and U.S. DoD
- Export regulation reform (e.g., Blue UAS mutual recognition, expedited EAR clearances)
- Taiwan firms onboarded into U.S. supply chain mapping and threat vetting systems

This path accelerates Taiwan's ODM/OEM ambitions and enhances its geopolitical value within allied drone architecture. However, it may also require Taiwan to adopt more stringent IP protections, formalize domestic export controls, and increase investment in certification/testing infrastructure.

Scenario 3: Fallback Autonomy

In this scenario, U.S. political or industrial policy shifts result in reduced willingness to share drone technology with Taiwan—either due to "America First" priority, rising export risk sensitivity, or redirected U.S. defense priorities. Taiwan is forced to fall back on its indigenous R&D ecosystem, absorbing

3.4 Deep Dive: Scenario-Based Strategic Trajectories

higher costs, slower timelines, and significant technical risk.

Key features include:

- Reduced access to U.S. components (e.g., AI chips, secure radios, ISR payloads)
- Increased emphasis on localized manufacturing, software development, and sensor integration
- Expansion of TEDIBOA's role from coordination to full platform production

While this scenario strengthens Taiwan's self-reliance, it risks creating a two-tiered market: one for domestic defense and one for exports with constrained competitiveness.

These three trajectories form the basis of Taiwan's strategic choice set. Each carries distinct implications for procurement planning, industrial investment, alliance strategy, and geopolitical risk management. The next section offers a deeper analysis of each scenario's industrial, strategic, and operational consequences.

Scenario 1: Incremental Integration (Baseline Trajectory)

Under a "business-as-usual" baseline, Taiwan steadily improves UAV production capabilities through indigenous development, commercial adaptation, and selective international cooperation. U.S. support remains stable but limited to legacy mechanisms like FMS, FMF, and ad hoc technology sharing. In this environment, Taiwan would likely continue to assemble U.S.-origin systems such as the MQ-9B, Switchblade 300, or ALTIUS-600 under restrictive licensing terms—without full access to source code, software upgrades, or sensor customization.

Industrial Implications:

- Taiwan strengthens its Tier 2/Tier 3 role (composite materials, GCS integration, basic power systems)
- Component-level substitution improves, but Taiwan still lacks leverage in propulsion, optics, and C5ISR payloads
- TEDIBOA remains a coordination mechanism, not an R&D or

manufacturing leader

Policy Implications:

- Taiwan must continue working around ITAR and EAR licensing delays, especially for ISR-capable drones
- Procurement remains fragmented across MND, MOEA, and MOTC with limited scale consolidation
- Minimal access to U.S. drone certification pipelines (e.g., Blue UAS)

Strategic Risk:

- Taiwan becomes partially integrated but structurally dependent
- A future political shift in Washington could derail hard-earned progress if relationships aren't institutionalized

In this trajectory, Taiwan's role remains transactional and incomplete. Without co-production rights, modular testing, or certification alignment, integration proceeds slowly and remains reversible.

Scenario 2: Institutionalized Partnership

In this higher-trust model, Taiwan becomes a co-development partner in U.S.-led democratic drone networks. Policy and procurement channels are aligned, and Taiwan gains access to subsystem design, test infrastructure, and certification pathways.

This scenario would require new institutional tools—such as a U.S.–Taiwan Drone Industrial Cooperation Framework—modeled after submarine, semiconductor, or Indo-Pacific AUKUS-style tech-sharing mechanisms.

Industrial Implications:

- Taiwan scales from integrator to co-designer of critical modules (e.g., flight control software, AI vision chips, GCS/C2 systems)
- Establishment of domestic final assembly and test (FAT) facilities for allied drone platforms
- Blue UAS–aligned joint certification paves the way for export to third-party democracies

Policy Implications:

- Clearer alignment of FMS, FMF, and PDA systems with Five Trust Industries goals
- Easing of export licensing for dual-use ISR systems
- Potential inclusion of Taiwan firms in U.S. drone supply chain mapping and Red/Yellow component screening

Strategic Advantage:

- Taiwan reduces time-to-market, raises platform competitiveness,

and cements its role in the democratic drone supply chain
- The U.S. benefits from diversifying away from China-origin components and securing Indo-Pacific manufacturing redundancy

Risks & Tradeoffs:

- Taiwan may face U.S. demands for stricter IP enforcement, regulatory harmonization, or limited export flexibility
- Possible tensions with European partners if integration is seen as U.S.-exclusive

Scenario 3: Fallback Autonomy

In this fallback pathway, Taiwan pursues full UAV industrial autonomy due to reduced U.S. support, tightened export control regimes, or broader geopolitical realignments that constrain defense cooperation and technology access. While challenging, this path reflects lessons from the IDS program and domestic chip acceleration strategies. Taiwan would focus on creating vertically integrated platforms—using domestically sourced components where feasible and replacing U.S. modules with European, Israeli, or self-developed alternatives.

Industrial Implications:

- Surge in investment for "Three Chips and Two Softwares" localization
- TEDIBOA evolves from alliance builder to core national drone integrator
- Expanded R&D programs at NSTC and MOEA for propulsion, secure data links, and thermal imaging

Policy Implications:

- Establishment of "China-free platform" certification for both domestic use and allied export
- Greater emphasis on sandbox testing, modular standards, and civilian–military demand consolidation
- Development of bilateral drone corridors with India, Japan, Lithuania, Poland and Czech outside of the U.S.-centered systems

Strategic Risk:

- Higher costs, slower innovation, limited scale
- Taiwan may be cut off from advanced U.S. payloads (e.g., ISR packages, AI-enabled targeting)
- Uncertain global demand for non-U.S.–aligned platforms

unless procurement is politically guaranteed

Strategic Advantage:

- Greater national control, resilient domestic capacity, ability to innovate under pressure
- Model for third-party nations wary of overdependence on U.S. or China tech stacks

The three scenarios outlined above—incremental integration, institutionalized partnership, and fallback autonomy—each offer distinct policy, industrial, and strategic implications. While these models are not mutually exclusive, only the strategic partnership pathway offers Taiwan the potential to scale its role as a trusted, co-producing member of a democratic drone ecosystem. Encouragingly, several developments already underway suggest elements of this partnership are beginning to materialize—if still unevenly. The next section examines where progress is already happening on the ground.

3.5 Bridging Policy and Supply Chains: U.S.–Taiwan Implementation in Progress

As outlined in the scenario framework and deep-dive analysis above, Taiwan's future in the global UAV ecosystem depends on how quickly and deeply the U.S. and Taiwan can move from conceptual alignment to institutional implementation. While many challenges remain, recent developments suggest the contours of a U.S.–Taiwan strategic partnership are already beginning to form—not just in doctrine, but in policy, supply chain realignment, and operational coordination. This section highlights several of these developments and assesses their potential to enable long-term industrial and strategic cooperation.

In one of the few comprehensive public reports on the application of drones in an Indo-Pacific conflict, the Center for a New American Security (CNAS) issued key policy recommendations for Taiwan and U.S. policymakers on drone production and deployment. CNAS suggests that the U.S. prioritize the acquisition of "good enough" long-range drones – emphasizing quantity over quality – to boost operational capacity in the Pacific and to invest in autonomous kamikaze drones for maritime targets. Additionally, it recommends the U.S. to pre-position short- and medium-range drones in Taiwan and advance counter-drone defenses. On the other hand, CNAS recommends that Taiwan focus on building its drone industrial base to produce FPV kamikaze drones, short- and medium-range aerial drones, and uncrewed sea and underwater vehicles, with an emphasis on integrating hardware, software, and operational strategies across its armed forces. In other words, since the U.S. must overcome the tyranny of distance, its focus should be on fielding long-range and scalable drone systems. Meanwhile, Taiwan

should prioritize short- and medium-range platforms tailored to defending its immediate periphery. This division of labor reflects a practical path for Taiwan–U.S. coordination, where each side leverages its comparative advantages to shape a more resilient and distributed deterrence posture.

As ties between Taiwan and the U.S. deepen, there is potential for collaboration across various sectors—including defense, trade, and technology—that can help both countries address these vulnerabilities. In light of the significant weaknesses that both the U.S. and Taiwan face in their UAV production, however, there remains considerable room for growth in individual drone usage, production, and acquisition efforts.

A key weakness in American and Taiwanese UAV supply chains is their dependence on China for essential materials. UAV manufacturing relies heavily on rare earth materials like neodymium, which are required for manufacturing key parts such as permanent magnets. To date, China is both the dominant supplier and processor of rare earth materials. As of 2024, China produces around 60% of the world's rare earth materials and processes nearly 90% of them. Over reliance on China's supply of rare earth materials poses a security risk, as the country has precedent in exploiting its market dominance to compel adversaries into meeting its political aims. During the 2010 Senkaku boat collision incident, for instance, China limited the export of rare earth materials to Japan as retaliation. Diversification from a monopolistic market player will require a multilateral effort between like-minded nations. While Taiwan does not possess rare earth reserves and cannot substitute China in this domain, it can still contribute to overall supply chain resilience by localizing the production of non-sensitive UAV components, reducing reliance on Chinese-made electronics, and deepening cooperation with vetted suppliers. These efforts strengthen the integrity of downstream manufacturing—even if upstream material dependencies remain.

There are several strategies for the U.S. and Taiwan to mitigate risks from China's dominance in the UAV market and critical supply chains. First, Taiwan can leverage its semiconductor expertise to position itself as a key player in global, non-Chinese drone supply chains. The DSET, a newly established think tank under Taiwan's NSTC, has recommended Taiwan to eliminate Chinese components from its supply chains, reform regulations to encourage drone industry growth, and invest in human capital for the development of UAV technology. In doing so, Taiwan can bolster its defense capabilities, contribute to a more diversified UAV market, and pave the way for more secure and robust Taiwan-US cooperation in drone production at the industrial level. As both countries seek to

expand their limited domestic markets and counter the global dominance of Chinese firms, the U.S. could consider increasing its purchases from Taiwan, especially as the U.S. evaluates a potential ban on DJI, one of the world's largest consumer drone manufacturers based in China. Indeed, recent reports suggest that defense contractors in the two countries have already begun efforts to cooperate and build supply chains that circumvent China, achieving "China-free" supply chain goals.

Second, the U.S. could facilitate technology transfers and licensing agreements with Taiwan, enabling Taiwan to produce US-designed defense systems or components domestically, including UAVs. This approach would allow Taiwan to have timely access to critical defense systems amid global delays in U.S. weapons deliveries. Although the U.S. has longstanding concerns about providing Taiwan with its defense technology, particularly the risk of it falling into China's hands, recent U.S. government reports indicate that such agreements are increasingly plausible. The 2023 National Industrial Strategy recommends deepening international defense relationships to overcome shortcomings in the US defense industry by leveraging Security of Supply Arrangements (SOSAs), which allow the U.S. and partner countries to request key components from each other's industrial bases. Taiwan has expressed strong interest in being included in SOSA. Additionally, U.S. lawmakers on both sides of the aisle have supported the idea of offering Taiwan transfers and licensing agreements, or at least, cooperation on some aspects of defense production. To address the significant backlog of arms sales to Taiwan, members of Congress from the US House Select Committee on the CCP have voiced support for allowing Taiwan to produce U.S.-designed systems. This year, the House and the Senate introduced bills H.R.8238 and S.4241, respectively, that would assess opportunities for joint research and development efforts to strengthen each country's defense industrial bases. Both the House and Senate versions of the bill have been incorporated into the 2025 NDAA.

Third, Taiwan and the U.S. could engage in joint training exercises to integrate drones in different conflict scenarios. In March 2024, then Taiwan's Minister of Defense, Chiu Kuo-cheng, confirmed that U.S. special forces were training alongside Taiwanese forces in Taiwan's outlying islands, though the Pentagon has yet to confirm this. Among other exercises, training reportedly included the use of the Black Hornet Nano, a micro UAV. Equally crucial, if not more so, than the procurement and production of drones is Taiwan's ability to deploy these systems effectively in real combat situations, particularly in joint operations with crucial

partners like the U.S.. These efforts must continue, even if discreetly.

Equally important to Taiwan's effective drone deployment in joint operations is the standardization of procurement and use of UAS, a task that US federal agencies have successfully undertaken. In November 2024, U.S. DoD, National Aeronautics and Space Administration (NASA), and the General Services Administration (GSA) issued temporary directives addressing gaps created by federal-level China-free actions. Under the guidelines of the 2024 NDAA, the GSA recommended that federal agencies refer to the DIU's Blue UAS Cleared list when acquiring UASs. This list, also adopted by NASA and the DoD, has become a standard guideline for UAS procurement across U.S. federal agencies. Aligning Taiwan and the U.S. around these standards would not only facilitate interoperability, but would also enhance Taiwan's ability to operate effectively in joint exercises and conflict scenarios with the U.S..

At the state and local levels, gaps caused by China-free action are being addressed through strengthened US-Taiwan cooperation. The MOU between the ODIA and TEDIBOA is a case in point. The MOU formalizes collaboration in drone technology, supply chain integration, and global marketing. Taiwanese manufacturer CIRC—which has already supplied 3,000 drones to replace DJI models used by emergency services in major American cities—demonstrates Taiwan's growing importance in building the "China-free Supply Chain" that both Taiwan and the U.S. seek. This is a partnership that leverages both Taiwan's strength in manufacturing and the U.S.'s strength in technological expertise.

These developments show that elements of a **strategic drone partnership are already emerging.** While fragmented and still largely ad hoc, they point to an opportunity: to move from pilot programs and policy experimentation to permanent infrastructure, certification pathways, and shared training pipelines. The next section outlines the industrial strategies that can help scale these early efforts into a **trusted, democratic UAV production ecosystem.**

3.6 Industrial Pathways: From Co-Production to Allied Integration

As demonstrated in the previous section, Taiwan and the U.S. have begun exploring a range of bilateral efforts—spanning supply chain diversification, component licensing, and public safety drone procurement—that offer proof of concept for deeper institutional coordination. Building on these foundations, this section outlines a forward-looking framework to expand joint certification, co-production, and allied integration—transforming one-off collaboration into a scalable model for democratic drone development.

3.6.1 Co-Production Opportunities and Constraints

Taiwan's growing reliance on U.S.-origin UAV platforms—such as the MQ-9B SkyGuardian, ALTIUS 600M-V, and Switchblade 300—raises critical questions about its role in the broader democratic drone supply chain. While Taiwan has made major progress in establishing an indigenous UAV base, its integration into allied co-production channels remains limited and uncertain.

To date, none of the U.S.-delivered platforms to Taiwan involve FACO or licensed subsystem integration. Taiwan's defense contractors remain consumers of completed systems, rather than contributors to production pipelines. This mirrors earlier U.S.–Taiwan projects like the F-16V upgrade program, where Taiwan played a logistics and sustainment role, but without local manufacturing rights. The lack of a formal drone co-production framework leaves Taiwan vulnerable to regulatory bottlenecks and political headwinds—especially under scenarios of strategic decoupling or "America First" priority.

3.6.2 Barriers to Integration with U.S. Drone Supply Chains

Export Controls and Regulatory Constraints

U.S. export regimes, particularly ITAR and EAR, have long imposed restrictions on the transfer of drone-related technology. Even components not considered classified—such as flight control software, communications modules, and targeting optics—can trigger compliance risks. Taiwanese subsystem providers have reported prolonged delays and inconsistent guidance on whether their designs are export-eligible, testable, or integrable with U.S. platforms. Unlike countries with standing technical assistance agreements (e.g., NATO members, AUKUS partners), Taiwan lacks a streamlined review process for dual-use UAV components. This regulatory opacity discourages long-term planning and hinders supplier onboarding.

Absence of a Co-Production Institutional Mechanism

Unlike the submarine and jet fighter—where Taiwan has secured bilateral technical agreements—no joint mechanism exists to facilitate UAV co-development, component vetting, or production sharing. The absence of a Taiwan–U.S. drone co-production framework creates a structural dependency: Taiwan can only participate through end-item purchases or opportunistic offsets. Without a formal mechanism for Blue UAS certification alignment, export-approval pre-clearance, or FACO planning, Taiwan remains outside the ecosystem despite its technical readiness.

Strategic Ambiguity Around Taiwan's Role

U.S. firms remain uncertain whether Taiwan will be a long-term co-developer, a Tier 2 subcontractor, or merely an end-user. This ambiguity weakens supply chain integration and limits investment.

Taiwanese firms face difficulty positioning themselves in U.S. programs without clarity on:

- Intellectual property ownership
- Data governance standards
- Dual-use export pathways
- Certification parity with Blue UAS

The lack of formal inclusion in drone supply chain mapping exercises—as performed under the U.S. NDAA—compounds this strategic opacity.

3.6.3 Strategic Levers for Enhancing U.S.–Taiwan Drone Cooperation

Despite these challenges, Taiwan and the U.S. have several options for deepening industrial coordination—especially in a "Scenario 2: Accelerated Partnership" future.

Establish a Taiwan–U.S. Drone Co-Production Working Group

A dedicated institutional mechanism could coordinate:

- Technology transfer vetting
- Blue UAS alignment pathways
- Modular co-design pilots
- FACO feasibility assessments

Such a group could be modeled on bilateral tech-cooperation structures already used in semiconductors and cyber—prioritizing platforms where Taiwan offers competitive advantage (e.g., comms chips, GCS, propulsion, compact ISR).

Pilot Joint Certification Pathways for Select Subsystems

Taiwan could partner with U.S. integrators to pilot joint certification of low-risk, modular components—beginning with:

- GCS
- Swarm communication interfaces
- GNSS-denied navigation modules

This would allow Taiwan to integrate into U.S. systems without needing full platform access or export-license exemptions.

Expand Strategic FACO Rights for Taiwan

Future deliveries of Switchblade, ALTIUS, or next-generation attritable drones could include Taiwan-based final assembly rights, reducing logistics burden for U.S. forces and enhancing local sustainment capacity. FACO arrangements could include layered cybersecurity testing, packaging, and last-mile configuration for specific Indo-Pacific operational needs.

Leverage TEDIBOA as a Liaison Platform

TEDIBOA, while initially focused on supply chain coordination, could evolve into a strategic platform for:

- Export pipeline planning with Blue UAS–certified U.S. integrators
- Vetting of "China-free" parts
- Regional trilateral cooperation (e.g., with Japan, Australia, South Korea, and the Philippines)

This would position TEDIBOA not only as a domestic policy tool but as a transnational interface for democratic drone supply chain development.

3.7 Policy Recommendations

Building on the scenario framework introduced in Section 3.3, this section outlines targeted policy domains that translate strategic analysis into institutional action. Each recommendation corresponds to one or more of the three trajectories identified earlier—**Incremental Integration, Institutionalized Partnership**, and **Fallback Autonomy**—and is designed to help Taiwan and the United States navigate the uncertain landscape of drone cooperation.

Rather than offering a singular roadmap, the following proposals present adaptable mechanisms to enhance resilience, deepen industrial interoperability, and reinforce Taiwan's position within a democratic drone supply chain, regardless of how U.S. policy evolves.

These recommendations apply specifically to **military-grade UAVs procured from the United States**, including systems such as the MQ-9B, ALTIUS, and Switchblade. They are intended to support Taiwan's transition from importer and subsystem contributor to **trusted co-producer and final assembler**, under secure, interoperable, and politically durable frameworks.

3.7.1 Policy Domain I: Institutional Co-Production and Certification Alignment

Challenge 1: Taiwan Lacks a Formal Mechanism for Subsystem Co-Production and Final Assembly
Despite Taiwan's growing technical capabilities and prior experience with subsystem adaptation (IDF) and sustainment (F-16V), it remains excluded from structured U.S. co-production frameworks. This exposes UAV cooperation to regulatory uncertainty, limits Taiwan's upgrade and sustainment flexibility, and leaves no institutional pathway for future FACO or co-design participation—models already extended to Japan (F-35 FACO) and South Korea (Gray Eagle STOL co-development).

Recommendation 1: Establish a Bilateral Drone Co-Production Working Group For Taiwan and the United States:

- Create a dedicated U.S.–Taiwan drone working group building on past bilateral coordination models in defense procurement and technology transfer—such as the IDF program's subsystem adaptation, the F-16V sustainment

upgrade, and the IDS program's discreet co-production channels.
- Empower this body to coordinate subsystem integration, compliance tracking, Blue UAS alignment, and future FACO planning.
- Prioritize platforms where Taiwan holds comparative advantages, such as secure communications modules, GCS systems, and ISR payloads.

Challenge 2: Misalignment on Certification Standards and Export Controls

Taiwanese firms face barriers to entering U.S. procurement due to the absence of certification parity, unclear IP standards, and protracted export control processes. Even if Taiwan were authorized in the future to produce subsystems or components for U.S.-designed platforms under sustainment or co-production arrangements, those parts would currently lack recognition under the Blue UAS certified subsystem list—limiting their interoperability, credibility, and potential adoption within U.S. and allied drone ecosystems.

At the same time, key technologies remain subject to ITAR/EAR export controls, and Taiwan has not been formally designated as a trusted industrial partner under U.S. law. Without policy adjustments that recognize Taiwan's unique strategic status, these constraints would continue to slow or block subsystem-level integration, even for authorized and security-aligned platforms.

Recommendation 2: Create Joint Certification and Fast-Track Export Pathways
For the United States:

- Direct the Departments of State and Commerce to implement **expedited ITAR/EAR approval tracks** for Taiwanese-manufactured UAV subsystems that may be authorized for future co-production or sustainment use.
- Ensure that, once authorized, **Taiwan-produced components are eligible for inclusion in the Blue UAS certified subsystem list**, demonstrating they meet the same safety and cybersecurity standards as U.S.-produced parts.
- Adjust export review frameworks to account for Taiwan's unique status and strategic reliability as a trusted defense partner.

For Taiwan:

Expand domestic testing and compliance infrastructure to meet **Blue UAS certification benchmarks** for future eligible subsystems. Establish an interagency export and certification office to coordinate pre-approval processes for components that may be subject to U.S. regulatory review.

3.7.2 Policy Domain II: Scaling Integration Through Modular and Distributed Production

Challenge 3: No Designation for Final Assembly and Sustainment of U.S.-Origin UAVs
Although Taiwan has procured over 900 U.S. drones, including MQ-9B and ALTIUS systems, it has not been granted rights to perform final assembly, configuration, or lifecycle sustainment—in contrast to Japan's FACO role for F-35s. This limits Taiwan's ability to tailor platforms to regional needs or support surge-readiness in a contingency.

Recommendation 3: Designate Taiwan as a Regional Hub for Final Assembly and Sustainment

For Taiwan and the United States:

- Formally designate Taiwan as a regional center for final configuration, component integration, and sustainment of select U.S. UAV platforms.
- Embed cybersecurity layering, testing protocols, and spare parts pre-positioning tailored to Indo-Pacific operational environments.
- Pre-position spare parts and testing infrastructure to improve surge-readiness in cross-Strait scenarios.

Challenge 4: No Central Coordination Platform for U.S.–Taiwan–Allied Drone Cooperation
Taiwan's UAV planning is split among MND, MOEA, and MOTC; U.S. roles are similarly divided across DoD, State, and DIU. This fragmentation reduces predictability, delays certification, and inhibits strategic alignment with partners like Japan and Australia.

Recommendation 4: Institutionalize TEDIBOA as Taiwan's Industrial Coordination Mechanism
Due to its unique international status, Taiwan lacks formal defense-industry coordination channels with the U.S. TEDIBOA (Taiwan Excellence Drone Industry and Business Alliance) should be formally designated as Taiwan's official coordination entity for international UAV cooperation.

For Taiwan:

- Empower TEDIBOA to coordinate subsystem certification, export pipeline planning, and trilateral engagement with democratic partners.
- Anchor TEDIBOA's role through interagency mandates from MOEA and MND.

For the United States:

- Recognize TEDIBOA as Taiwan's institutional interface for UAV supply chain cooperation, certification alignment, and trusted supplier identification.
- Integrate TEDIBOA into ongoing drone industrial mapping efforts authorized under the NDAA.

3.7.3 Policy Domain III: Scenario-Responsive Policy Planning

Challenge 5: Strategic Uncertainty Undermines Long-Term Investment
As shown in past programs like the IDS and IDF, Taiwan has repeatedly had to operate under ambiguous or informal arrangements. Without legal recognition or stable frameworks, its private sector faces persistent risks from U.S. political turnover, shifting export policy, and unclear integration pathways.

Recommendation 5: Codify Taiwan's Role in the Democratic Drone Supply Chain Under U.S. Law

For the United States:

- Enact legislation (e.g., via NDAA amendments) that explicitly defines Taiwan as a priority partner in a China-free UAV supply chain.
- Use congressional language, executive branch guidance, and defense memoranda to anchor Taiwan's co-production, subsystem integration, and export participation.

For the United States:

- Use the scenario framework presented in this chapter to align domestic investment, procurement, and R&D planning with different levels of U.S. policy engagement—whether incremental, institutionalized, or autonomous.
- Ensure that Taiwanese industry can pivot across these pathways without losing momentum or capital exposure.

The policy domains outlined above operationalize the chapter's scenario framework by identifying concrete levers to support Taiwan's integration into the democratic UAV ecosystem. They underscore a central message of this chapter: **modular co-production, certification alignment, and institutional coordination are not optional—they are strategic necessities.** The success of Taiwan's next phase of UAV development will depend on formalizing the mechanisms that past programs lacked.

3.8 Conclusion: Strategic Options for Resilience and Partnership

Taiwan's UAV strategy stands at a critical juncture. While it has made significant strides in establishing a domestic production base and building platforms tailored to Taiwan's defense doctrine, its ability to scale and globalize this industry depends on strategic coordination with the U.S. and allied partners. The choices ahead are not purely technical; they are political, institutional, and deeply tied to evolving U.S. defense policy. Taiwan's future as a democratic drone contributor hinges on whether it can move beyond buyer–supplier dynamics and secure a **layered role in subsystem integration, final assembly, and eventually co-design** within the China-free UAV supply chain.

The scenario analysis in this chapter illustrates three distinct trajectories:

- A baseline of **incremental integration**, in which Taiwan improves its industrial capacity but remains subject to unpredictable regulatory constraints
- A model of **institutionalized partnership**, where Taiwan gains structured roles in subsystem co-production and final assembly
- A **fallback path of self-reliance**, where Taiwan builds domestic control but at the cost of interoperability, scale, and time-to-market

Each path carries unique tradeoffs. Dependence risks political disruption; autonomy risks economic inefficiency. The optimal path requires careful hedging—**preserving sovereign production capacity while embedding into trusted international frameworks**.

To navigate this space, Taiwan must:

- Secure stable co-production mechanisms through a **U.S.–Taiwan working group and Blue UAS-compatible certification pathways**
- Advocate for **modular certification structures** and IP protections that enable subsystem-level integration without full platform transfer
- Expand **regional FACO arrangements**, and push for tailored **export control reforms under the U.S. NDAA** that recognize Taiwan's trusted status
- **Institutionalize TEDIBOA** not only as a national coordinator, but as a long-term commercial and diplomatic interface for trilateral drone cooperation with the U.S. and regional democracies

Above all, Taiwan must **institutionalize these partnerships before political windows close**. The current alignment of shared threat perceptions, congressional momentum, and Indo-Pacific industrial planning offers a rare opportunity to embed Taiwan into a democratic drone future.

This chapter has presented a roadmap for how Taiwan can build strategic resilience through **international co-**

production, subsystem certification, and industrial alignment. As the final chapter will explore, institutionalizing this partnership will require both sides to **rethink the architecture of drone collaboration**—from export control modernization to formal coordination platforms—and to ensure that **strategic autonomy and alliance credibility can be mutually reinforcing, not mutually exclusive**.

Conclusion

Drones, Democracy, and the Closing Window

UAVs are no longer tactical curiosities—they are strategic enablers of deterrence, resilience, and sovereignty. For Taiwan, drones have become central to reimagining how a smaller power can withstand coercion, project survivability, and signal resolve. For the U.S., drones represent a test case for whether its industrial base and alliance structure can adapt quickly enough to shape the Indo-Pacific security environment in real time.

Over the past three years, Taiwan has launched a credible domestic UAV effort, built public–private coordination platforms, and integrated drones into its defense doctrine. Meanwhile, the U.S. has initiated programs like Replicator and Blue UAS to secure its own uncrewed systems and diversify supply chains. Yet despite this parallel momentum, the two sides have not yet locked in the institutional cooperation required to scale, secure, and sustain a democratic drone partnership.

Taiwan continues to face structural constraints from fragmented procurement to dependence on foreign subsystems,while U.S. support remains limited to platform transfers and case-by-case coordination. If this asymmetry persists, Taiwan risks falling into a gray zone of limited interoperability and unscalable production.At the same time, the U.S. risks failing to develop trusted regional manufacturing capacity at the speed required to compete with China's drone diplomacy and defense exports.

The vision behind *Drones for Democracy* must now be realized through joint action.

This report has presented a roadmap for bridging that gap: co-production frameworks, modular certification pathways, joint innovation centers, and a shared commitment to building a China-free UAV supply chain. These steps are not just technical fixes—they are strategic commitments to collective resilience.

But, timing is critical. The opportunity to institutionalize Taiwan’s role in a democratic drone ecosystem will not last indefinitely. As political transitions, budget pressures, and global instability accelerate, both Taipei and Washington must act decisively.

Drones for democracy must become more than a slogan. It must become a system—**embedded, interoperable, and trusted** across a shared ecosystem of democratic defense.

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