C-UAS Global Supplement

Defeat Authority by Country | Physical Hardening | Fiber-Optic Drone Countermeasures | Ukraine Ecosystem | 2026

This supplement extends the C-UAS Capability and Cost Reference Guide with four additional reference sections: the global map of defeat authority for private/CNI operators; physical hardening and passive protection; countermeasures against unjammable fiber-optic FPV drones; and the Ukrainian drone manufacturing ecosystem including which companies are accessible to international buyers.

Global C-UAS Defeat Authority — Where Private and CNI Operators Can Act

Detection is legal in virtually every country. Defeat — jamming, spoofing, protocol takeover, kinetic intercept — is the restricted layer. As of May 2026. Rapidly evolving — verify before any operational deployment.

DEFEAT PERMITTED (broad authority) | GOV / MILITARY ONLY | EVOLVING / EXPANDING CNI | RESTRICTED / PROHIBITED | ACTIVE CONFLICT ZONE

COUNTRY	STATUS	DETECTION	DEFEAT: PRIVATE / CNI	GOVERNING BODY	KEY NOTES
Ukraine	CONFLICT ZONE	YES	YES	War Powers	Active war — all defeat authorized. EW, kinetic, fiber-optic countermeasures deployed at scale. Civilians may use defensive measures. Most permissive environment on earth.
Israel	CONFLICT / ELEVATED	YES	LIMITED (CNI expanding)	IDF / IAARC	Active conflict. IDF broad defeat authority. Civilian CNI petition for EW/kinetic at designated facilities. Iron Dome + C-UAS integrated.
Russia	PERMISSIVE (STATE)	YES	YES (state CNI)	Rosaviatsiya / FSB	Broad state defeat authority. State-owned CNI: broad defeat. Not relevant for Western commercial procurement.
China	PERMISSIVE (STATE)	YES	YES (state/gov only)	CAAC / PLA	State/military broad defeat. Approved state CNI: petition-based. Foreign vendors largely excluded from Chinese market.
UAE / GCC	PERMISSIVE	YES	YES (state energy CNI)	GCAA / UAE AF	Significant defeat latitude for approved operators. State energy CNI (ADNOC equivalent): extended authority. Active Western + Israeli C-UAS procurement.
Saudi Arabia	PERMISSIVE	YES	YES (ARAMCO / state CNI)	GACA / Saudi AF	State-owned CNI broad defeat. Ukrainian drone expert teams deployed March 2026. Active procurement program.
United States	GOV / FED ONLY	YES	NO (fed only)	FAA / FCC	Most restrictive major democracy. FAA UAFR NPRM (May 2026): airspace restriction ONLY — no defeat. DHS/DOJ/DoD only for all defeat methods. Legislation pending.
United Kingdom	GOV / MIL ONLY	YES	LIMITED (police/airports)	CAA / Home Office	Counter-Terrorism Act: police and military broad defeat. Airports: extended police authority. Private CNI: NO. Legislative review active.
Australia	GOV / MIL ONLY	YES	NO (fed only)	CASA / ACSC	AFP and ADF hold defeat authority. Private CNI: detect and report only. Legislation review post-Ukraine lessons.
Canada	GOV / MIL ONLY	YES	NO (fed only)	Transport Canada	RCMP/CBSA/CAF only. Similar to U.S. framework. Private CNI: detection only.
Germany	EVOLVING	YES	EXPANDING (airports, nuclear, CNI)	LBA / BPolG	Leading NATO Drone Wall. Police + Bundeswehr: broad defeat. Airports, nuclear, parliament: extended authority post-2024 legislation. Private CNI: expanding petition process.
France	EVOLVING	YES	EXPANDING (CNI petition)	DGAC / Gendarmerie	Gendarmerie: broad defeat. CNI operators at sensitive sites: petition-based defeat. Paris 2024 Olympics demonstrated expanded use model.
Poland	EVOLVING	YES	EXPANDING (energy, water, border)	ULC / MON	$2.2B drone wall investment. Military: broad. CNI energy/water: expanded under 2025 defense legislation. Most advanced CNI defeat framework in Central Europe.

COUNTRY	STATUS	DETECTION	DEFEAT: PRIVATE / CNI	GOVERNING BODY	KEY NOTES
Estonia	EVOLVING — LEADING	YES	EXPANDING (broadest in EU)	ECAA / EDF	Baltic states leading EU on CNI drone defense. 2025 legislation expanded CNI defeat authority significantly. Eirshield multi-layer system deployed. Broadest CNI defeat latitude in EU.
Latvia	EVOLVING	YES	EXPANDING (petition, expanding)	CAA Latvia / NAF	First NATO nation: full eastern border acoustic detection. €50M allocated 2026. CNI petition defeat process expanding.
Finland	EVOLVING	YES	EXPANDING (energy, nuclear, water)	Traficom / FDF	Post-NATO: expanded defeat authority. Energy, nuclear, water CNI: petition-based expanding rapidly.
Japan	EVOLVING	YES	EXPANDING (airports, nuclear, gov)	MLIT / JCAB	2024 amendments significant expansion. Police defeat at airports, government, nuclear. Private CNI: expanding via petition.
South Korea	EVOLVING	YES	EXPANDING (airports, nuclear)	MOLIT / ROK AF	Post-North Korea drone incidents: significantly expanded. Military broad. Airports/nuclear/government: extended police authority.
India	GOV / MIL ONLY	YES	LIMITED (nuclear, airports)	DGCA / MoD	Military and CAPF defeat authority. Nuclear, airports: expanded under 2024 amendments. Private CNI: detect + alert. Legislation moving.
Brazil	RESTRICTED	YES	NO currently	ANAC / FAB	Military: defeat authority. Private CNI: detect only. G20 2024 showed broader temporary authority model. Legislation evolving.
Mexico	RESTRICTED	YES	NO currently	SCT / SEDENA	Military/federal police: defeat. Cartel drone threats accelerating military C-UAS. Private CNI: detect only.
EU (EASA)	EVOLVING	YES	MEMBER STATE DEPENDENT	EASA / national CAAs	EU does not set defeat policy — member states do. Feb 2026 EU Drone Action Plan called for harmonized CNI defeat framework. EU-level legislation expected 2026-2027.
NATO (General)	EVOLVING	YES	MILITARY YES; CNI VARIES	NATO / national auth	Military at member installations: broad defeat. Civilian CNI: varies significantly by country. NATO Drone Wall driving harmonization.

Key trend 2026: *Every NATO eastern-flank nation expanding CNI defeat authority. U.S. remains most restrictive major democracy. EU-level harmonization legislation expected 2026-2027. Watch Estonia/Poland/France as the leading edge of where Western CNI defeat authority is heading.*

Physical Hardening and Passive Drone Protection for Facilities

Physical and passive protection requires no legal authority and creates no RF interference. Legal everywhere, immediately deployable. Ukraine has proven these at industrial scale. Directly applicable to data centers and CNI.

ANTI-DRONE NETTING AND PHYSICAL BARRIERS

MEASURE	HOW IT WORKS	APPLY TO	COST RANGE	VENDORS / SOURCES
Anti-Drone Netting over Critical Assets	Poly or metal-mesh nets over cooling towers, generators, equipment, access roads. Proven at scale in Ukraine — 534+ km installed by end 2025, 2,500 miles planned by end 2026. Stops FPV drones, payload drops, and reconnaissance regardless of control method (RF or fiber-optic).	Cooling towers, generators, transformers, outdoor IT, access roads	$5–50/m² net + $10–50/m² support structure	Robetco (Poland), Karman Line Aerospace (UK-Ukraine), agricultural/industrial net suppliers
Blast-Rated Screens and Armored Enclosures	Steel, Kevlar-composite, or UHMWPE panels around critical outdoor equipment. Stops drone-delivered fragmentation, shaped-charge, and incendiary payloads. Pre-fabricated blast-rated generator enclosures commercially available.	Emergency generators, fuel tanks, UPS, outdoor switchgear, cooling plant	$200–1,500/m² rated panels; $50K–500K pre-fab enclosures	Hesco Bastion (UK), Force Protection Industries (US), FRAG-Proof Solutions, Hardened Structures LLC
Visual and Thermal Concealment	Non-reflective thermal-masking fabric and multi-spectral camouflage prevents EO/IR drone reconnaissance from identifying high-value targets. Ukraine uses agricultural netting + purpose-built Saab Barracuda material.	Cooling exhaust, roof HVAC, outdoor power infrastructure	$10–80/m² agricultural netting; $50–200/m² thermal masking	Saab Barracuda (Sweden), Fibrotex (Israel)
Access Road Canopy Netting	Pole-supported netting canopy over access roads, loading docks, vehicle approaches. Prevents drone ambush of vehicles and personnel. Ukraine: 'roads of life' netted between cities. Direct analogy: data center access roads.	Vehicle access roads, loading docks, pedestrian entry	$20–100/linear meter pole-supported canopy	Standard construction contractors

STRUCTURAL AND UNDERGROUND HARDENING

MEASURE	HOW IT WORKS	APPLY TO	COST RANGE	VENDORS / SOURCES
Critical Asset Underground Routing	Move fuel lines, fiber conduits, power feeds, cooling supply lines underground. Ukraine lesson: above-ground fuel and fiber are primary targets. Underground routing eliminates the attack surface permanently.	Fuel lines, fiber trunk routes, primary power feeds, cooling supply	$500–5,000/linear meter for trenching and conduit	Standard civil engineering — no specialized vendor required

MEASURE	HOW IT WORKS	APPLY TO	COST RANGE	VENDORS / SOURCES
Reinforced Concrete Protective Structures	Cast-in-place or pre-fabricated concrete around generators, transformers, cooling equipment. Provides blast and payload protection. Ukraine uses Jersey barrier arrays and permanent concrete enclosures.	Emergency generators, main transformers, UPS, cooling plant	$50K–500K per installation	Standard civil construction. Structural engineering required for rated designs.
Armored Communications Infrastructure	Armored conduit, underground routing, hardened repeater enclosures for fiber and copper. Drone attacks target visible communications infrastructure.	Fiber entry points, telecom infrastructure, above-ground repeaters	$200–2,000/linear meter armored conduit	ABB, Siemens, Prysmian, Corning — standard industrial supply

OPERATIONAL SECURITY AND PASSIVE MEASURES

MEASURE	HOW IT WORKS	APPLY TO	COST RANGE	VENDORS / SOURCES
Facility Footprint Masking	Cover HVAC exhaust (thermal), reduce night lighting, cover distinctive roof equipment, use non-reflective coatings. Drone operators target what they can see from above. Reduce targeting information available.	Roof equipment, HVAC, visible exhaust, distinctive infrastructure	Low — primarily operational procedure + material cost	Internal. DoD JIATF Physical Protection of CNI Guide (Jan 2026)
Drone-Perspective Site Assessment	Hire a licensed drone pilot to assess your facility from above and identify targeting vulnerabilities — cooling towers, generator positions, fiber entry points, fuel storage. Ukraine lesson: look at your facility the way an attacker does.	All outdoor and rooftop areas, critical equipment positions	Low — $2,000–10,000 for professional drone assessment	Part 107 certified drone operator + physical security consultant
Counter-Reconnaissance Protocol	Pre-flight detection sweeps before sensitive activities. Cover equipment during construction. Restrict aerial photography via FAA UAFR petition (once available). Operational procedures reduce reconnaissance value of drone overflights.	All outdoor areas, construction phases	Very low — primarily procedural	Internal security team

Defeating Fiber-Optic FPV Drones — The Unjammable Threat

Why Fiber-Optic Drones Defeat Standard C-UAS

RF jamming has zero effect on fiber-optic FPV drones. The drone communicates through a physical fiber-optic cable that unspools during flight — no radio signal to jam, no GPS to spoof, no wireless protocol to take over. The entire RF defeat stack is irrelevant. By early 2026, 35+ Ukrainian manufacturers produce fiber-optic drones. Standard FPV: 10–20km range. Specialized platforms (Fold): 100km. Russia: 30–50% fiber-optic adoption in some front-line units. In 2025, countering FO drones became the central theme of NATO's Innovation Challenge. There is no single solution — countermeasures range from physical netting to AI interceptors. The correct response is layered detection + physical hardening + kinetic defeat where authorized.

METHOD	EFFECTIVENESS vs. FO DRONES	HOW IT WORKS	LIMITATION	APPLICATION / STATUS
Physical Anti-Drone Netting	HIGH — proven	Stops drones physically regardless of control method. RF, fiber-optic, or any other control system — the net catches the airframe. Ukraine: 534+ km netted. Works identically against FO drones as standard FPV.	Close-range; installation-specific; does not prevent reconnaissance	Most practical immediate CNI solution. Cooling towers, generator compounds, access roads. Cost: $5–50/m². Legal anywhere. No authority required.
Acoustic Detection	MODERATE — improving	FO drones are louder than standard FPV — heavier spool requires stronger motors producing distinctive noise. Acoustic arrays detect the signature. Ukraine: 14,000+ sensors, 95% interception coordination rate. Under $500/sensor.	Unreliable in high-noise environments; detection only; weather-affected	U.S. FEMA $500M C-UAS grant (Dec 2025) funding acoustic networks domestically. DefSecIntel Eirshield (Estonia). Directly applicable to CNI perimeter detection independent of RF.
Radar Detection (Drone-Specific)	MODERATE	FO drones reflect radar identically to standard FPV. Short-range detection with specialized small-target radar (Fortem TrueView, FLIR SkyRaider, DroneShield). Provides targeting cue for response.	Short range for small-class FPV; high false-positive rate in clutter	Legal for any CNI operator today. Pair acoustic + radar + EO/IR for RF-independent detection architecture.
EO/IR Optical Tracking with AI	MODERATE	AI-enabled cameras track FO drones visually and via thermal (motor heat). Legal everywhere. Provides cue for kinetic response or physical deployment (responders with net guns).	Requires line-of-sight; detection only	DroneShield VisionAI, Teledyne FLIR, Fortem SkyDome Manager. Critical for night coverage via thermal. Legal for all CNI operators.
AI Drone-on-Drone Intercept	HIGH (military grade)	Autonomous interceptor engages based on radar/acoustic/visual cue — no RF lock required. Ukraine: 100,000 interceptors produced 2025, capacity 8x grown. AI navigation works GPS-denied. Engages FO drones identically to standard FPV.	Military/federal use only in most countries; requires C2 infrastructure	Ukraine: Wild Hornets, General Cherry (Bullet), OSIRUS AI. NATO: Octopus-100 (UK, 1,000 units/month from Jan 2026). Future CNI application as defeat authority expands.
Cable Severing — Experimental	LOW — experimental	Attempts to cut fiber cable mid-flight using wire arrays or cutting mechanisms at fixed chokepoints. Operator may retain partial control on most protocols even with cable damage.	Very limited; cable thin and hard to target; partial control retained	Research stage. Some Ukrainian units deploying wire arrays at chokepoints. Not commercially available. Watch this space.

METHOD	EFFECTIVENESS vs. FO DRONES	HOW IT WORKS	LIMITATION	APPLICATION / STATUS
Physical Target Hardening	HIGH — passive backstop	Make the target resistant to damage when a drone gets through. Blast screens, armored enclosures, underground routing, redundancy. If you cannot jam it, protect the asset. This is the non-negotiable backstop against FO drones.	Does not stop the drone — reduces impact and damage	Legal everywhere. The FO drone threat makes physical hardening a primary control. See Physical Hardening section.

Architecture for FO-Drone-Aware CNI Sites: *Layer 1: Acoustic + radar + EO/IR detection (no RF dependency). Layer 2: Physical netting and hardened enclosures over critical assets. Layer 3: Kinetic interceptors when legally authorized. For U.S. commercial CNI operators today, Layers 1 and 2 are your entire toolkit. Design your architecture now so Layer 3 integrates cleanly when defeat authority arrives.*

Ukraine Drone Ecosystem — Companies, Products, and International Access

Ukraine is the most advanced real-world drone warfare laboratory on earth. 500+ manufacturers. Annual capacity exceeds $35 billion. 7 million drones planned in 2026. First formal export contracts expected mid-2026. Frontline supply takes absolute priority — contracts may pause during high-intensity operations.

How to Access Ukrainian Technology

Brave1 Government Platform (brave1.gov.ua): 3,000+ vetted defense tech projects. Primary entry for institutional/government buyers. NATO members access via NSPA framework.

Joint Ventures (most reliable for Western buyers): General Cherry/Wilcox Industries (New Hampshire, confirmed, 2026); TAF Industries/Wingcopter (Germany, Feb 2026); Octopus-100 (UK production, Jan 2026).

Direct company exports: DroneUA/603700 (flight controllers) already exporting to U.S. via dealer network since March 2025. Most commercially accessible path with no government agreement required.

Export controls: *Passive defensive systems (nets, radar, acoustic) have minimal restriction. FPV attack drones and EW systems require government-to-government or NATO framework agreements.*

COMPANY	PRODUCT TYPE	NOTABLE PRODUCTS	CAPABILITY SUMMARY	INTERNATIONAL ACCESS
TAF Industries	FPV / EW / Interceptor / Components	FPV kamikaze drones; EW/ELINT; reconnaissance UAVs; component kits	80,000 FPV/month capacity. ~$500M annual revenue. 5-company holding: FPV, EW, ELINT, recon, components. 1.5M+ component kits imported for Ukrainian ecosystem resale.	German-Ukraine JV with Wingcopter (Feb 2026) targeting NATO market. $20M overseas JV (49% TAF) operating. Best-positioned for Western market access. Brave1 platform.
General Cherry	FPV / Interceptor / Mid-range strike	Bullet interceptor drone; FPV; lightweight mid-range strike UAV	Founded Sept 2023 — one of Ukraine's largest drone makers. Bullet interceptor purpose-built for counter-drone missions. New mid-range drone designed to exhaust enemy air defense.	March 2026: deal with Wilcox Industries to produce in New Hampshire. First Ukrainian drone company with confirmed U.S. manufacturing. Most accessible for U.S. buyers. Direct commercial path exists.
Wild Hornets	Interceptor / FPV	Interceptor drones; FPV strike platforms	Ukraine's primary interceptor supplier. Denied Saudi Aramco negotiations (March 2026) — frontline supply priority stated explicitly.	Government platform access only currently. Direct export contracts expected mid-2026. Government-to-government only. Priority queue applies.
DroneUA / 603700	Electronics / Flight Controllers	Galicia v2 flight controller; FPV control systems; communication systems; robotics	Hundreds of thousands of flight controllers annually. Dual-use applications. Supplying NASA robotics evaluation.	Exporting flight controllers to U.S. since March 2025 via dealer network. Testing in North America. Most commercially accessible Ukrainian drone tech for U.S. buyers. No government agreement required.
OSIRUS AI	Interceptor / AI Systems	UEB-1 AI interceptor drone	AI-native interceptor with autonomous target acquisition. Tight integration of onboard computer + sensors + flight control for real-time terminal guidance in GPS-denied environments.	NATO Innovation Challenge 2025 (fiber-optic countermeasures). Technology transfer discussions with NATO partners. NATO framework access most likely pathway.
Fold / Fold Drones	Fiber-Optic / Long-Range FPV	Long-range fiber-optic FPV drones (100km range specialized platform)	Pushed fiber-optic FPV range to 100km. Represents frontier of FO drone capability. Primary value for CNI operators: understanding the threat ceiling you must plan against.	Military supply priority. No export availability. Understanding this capability is more important than purchasing it — it defines the threat your CNI sites face.

COMPANY	PRODUCT TYPE	NOTABLE PRODUCTS	CAPABILITY SUMMARY	INTERNATIONAL ACCESS
Octopus-100 (UK-Ukraine JV)	Interceptor — Mass Production	Octopus-100 modular interceptor	Serial production started January 2026 in UK. Target: 1,000 units/month. First mass production of Ukrainian combat drone inside NATO country.	UK-based production. Available through NATO/UK procurement framework. Directly available to NATO governments and designated CNI operators. Most scalable Western interceptor supply chain.
Brave1 Platform (Gov Hub)	Technology Marketplace	Government-vetted Ukrainian defense tech marketplace	Ukraine government-operated platform. 3,000+ vetted projects: detection, EW, drones, C2, software, physical protection.	Open to NATO and allied-nation buyers. brave1.gov.ua. Primary access point for institutional procurement. First stop for any organization seeking Ukrainian C-UAS technology.

What Ukraine Has Taught the World About CNI Drone Defense

Layering is everything. No single system stops all threats. Success comes from layering detection + EW + physical barriers + kinetic intercept. Every Ukrainian commander stated this in 2025.

Physical hardening is the most undervalued control in Western programs. Ukraine netted 534+ km of roads and plans 2,500 miles by end 2026 — not because they lack EW, but because barriers stop what EW cannot. For U.S. CNI operators who legally cannot defeat drones today, this lesson is even more critical.

Fiber-optic drones invalidate the EW-only approach. 35+ manufacturers producing FO drones by early 2026. Any C-UAS program built solely on RF defeat is structurally vulnerable.

Acoustic sensors are cheap and scalable. 14,000+ sensors at <$500 each. 95% interception coordination rates. U.S. FEMA $500M C-UAS grant (Dec 2025) now funding exactly this model domestically.

Iteration beats perfection. *Ukraine wins by iterating faster than Russia. For CNI: deploy layered detect-and-harden now. Add defeat capability when authority arrives. The threat will not wait.*

Sources: GIS Reports (Ukraine drone workshop Jan 2026), Atlantic Council (fiber-optic drones Feb 2026), Kyiv Post/Kyiv Independent (export policy, Wild Hornets, General Cherry/Wilcox), TAF Industries/Sacra, Unmanned Airspace Global C-UAS Directory, drone-warfare.com EW reference, VGI-9 (fiber-optic countermeasures May 2026), CNN/NPR (Ukraine netting Feb/Mar 2026), JIATF Physical Protection of CNI (DoD Jan 2026), FEMA C-UAS Grant, national aviation authority publications. CoreBastion Security Consulting | C-UAS Global Supplement 2026 | Internal Use Only | May 2026