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Buying Time: A Geotech Strategy for Germany

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Germany cannot outspend the United States or China in technology races, so its geotech strategy should compete where money cannot buy advantage: time. Two positions qualify: decades of accumulated knowledge, such as German optics and lasers in EUV lithography, and the weeks-long adaptation cycles of Ukraine's frontline procurement. Germany should anchor both and rent the capital-intensive middle while hedging against supplier coercion. Four actions follow: make decision-cycle time a NATO metric, integrate Ukraine into two-track procurement, govern chokepoint exports under European law, and keep exit options in cloud and AI. Chokepoint leverage rests on trust and must be used sparingly.

On the night of September 9, 2025, during a mass Russian air attack on Ukraine, radars across eastern Poland detected objects crossing the border. Some 19 drones entered Polish airspace. Polish F-16s and Dutch F-35s scrambled, Italian surveillance aircraft circled above, and German Patriot systems were alerted.

NATO fighters fired on Russian assets over member territory. They downed three to five of the drones, while the rest were never intercepted. The drones were mostly plywood-and-foam decoys, costing roughly $10,000 each. The missiles fired at them cost between several hundred thousand and a million dollars apiece.

Europe saw this event as proof of an air-defense gap: Article 4 was invoked, a new air-policing mission launched rapidly, and counter-drone programs accelerated. The gap was real. But it was also the symptom of a much deeper problem. What the night demonstrated was million-dollar missiles fired at $10,000 plywood. This was an alliance paying in money against an adversary paying in time. Germany, which anchors the Old Continent, cannot win technology contests denominated in money. It can only win contests denominated in time.

Strategic time comes in only two forms: decades of accumulated proprietary knowledge no rival can buy, and adaptation cycles of weeks no rival bureaucracy can match. German strategy should focus on the two ends of that spectrum and rapidly vacate the expensive middle where its current focus is directed, while pricing the dependencies that renting the middle creates.

Sovereignty does not require owning the stack, and competitiveness does not require leaving the alliance. Both require firmly owning the positions where time, not capital, is the true barrier to entry. Because only those positions can be held against the world's two largest economies. And also, only those can be held without being aimed at friends.

THE WRONG CURRENCY

The consensus views that dominate current strategy share one structural error. The first of those view regards capability replication: own cloud, a European frontier model, the subsidized leading-edge fab. Each program automatically jumps from dependence to duplication. When every participant can buy the inputs, the contest is decided by who has the deepest pockets. Europe's capital markets, hemmed in by fiscal rules and fragmented, are structurally shallower than American hyperscaler cash flows or the massive Chinese treasury.

This pattern has historical precedents. Britain and Germany both knew before 1914 that the dreadnought race was ruinous. The Haldane mission of 1912 failed because any freeze would ratify one side's position. The arms race eventually ended when one government could no longer fund it.

That is why, in the capital-intensive tech duplication race, Germany is structurally at a disadvantage. The second consensus is about rearmament quantified by industrial throughput: defense budgets aiming to reach five percent of GDP and huge orders of tanks and shells. The concerns are legitimate because magazine depth matters, drones alone cannot hold territory, and a continent that cannot produce cannot fight. But these programs measure the mass and quality of each decision, while the war on Europe's frontier is driven by the frequency of decisions.

In Ukraine, drone and counter-drone adaptation cycles run in weeks. The US Government Accountability Office finds that the American acquisition system takes roughly a decade to field the first iteration of a new system; German programs are no faster. A ministry can buy the drone. But it cannot buy the loop that improves the drone every fortnight because that loop is an institutional property, and institutions are the one thing procurement cannot procure.

Basically, both consensus positions look at competition in terms of money. In contrast, Germany's unique strategic leverage is denominated in time.

TWO TESTS AND TWO CLOCKS

Any position worthy of public investment should pass two tests. The first is whether it helps gain strategic leverage: a small input placed at the constraint that governs the whole system, amplified by a self-reinforcing loop rather than diluted by scale. The second is proprietary asymmetry. A position cannot be bought with money when its asset is accumulated history, which can only be run up through time.

A strategy deflects imitation when a rival copying it would be forced to dismantle the source of his own strength. Time denomination has its own test: Parallel spending cannot compress the calendar when each cycle's learning feeds the next and the cycles can only run in a particular sequence.

The slow clock has been ticking for decades and built a technological sovereignty that counterparts can only dream of. The machine at the heart of the global semiconductor system is assembled in Veldhoven, but it cannot exist without the optics produced by Zeiss in Oberkochen or the laser light source built by Trumpf in Ditzingen. The chokepoint is a Dutch-German artifact. The German technology layer is held by foundation- and family-owned firms that no ministry controls directly. This is privatized sovereignty in its most literal form: The state's strategic position resides in companies pursuing commercial logic, and the state's task is to govern what it does not own.

The leverage is total: Without extreme-ultraviolet lithography there are no leading-edge chips for anyone, whichever power wins the AI model race. Every EUV machine in a customer's fab is treated as a failed prediction about physics – identified, corrected, and fed into the next generation. That causal model based on error history cannot be bought, only re-accumulated.

Time-built assets decay the moment a competitor starts its own clock, and China's is already running. Since export restrictions began in 2019, Beijing has funded an alternative supply chain. That is the response that is triggered when a dependency is weaponized. The trust behind enduring the chokepoint is partially destroyed. The question for Germany is whether it rebuilds trust on its own or aligns with Washington.

The fast clock, for now, is neither German nor Western European. It is Ukrainian, yet well within reach. Through its state-run marketplace, a Ukrainian frontline brigade browses drones and electronic-warfare systems, filters by price and combat reviews, orders directly from the manufacturer, and takes delivery in an average of nine days. Units earn credits for verified hits based on battlefield video and spend them on the equipment they judge effective. Capital thus flows dynamically to demonstrated performance on the battlefield.

The strategic leverage: A small administrative mechanism moves the constraint that governs adaptation warfare. In June 2025, truck-launched drones costing under $2000 destroyed a substantial share of Russia's strategic bomber fleet deep in the country, thousands of kilometers from the frontlines.

The asymmetry applies to Ukraine's friends as firmly as to its enemy because a prime contractor cannot adopt shared failure data, front-line repair rights, and performance-routed capital without dismantling the intellectual-property monopoly and the multi-year cost-plus contract that make it profitable. A defense ministry cannot give soldiers purchasing authority without shrinking some bureaucrat's budget and signing power.

Western innovation portals have existed for years but changed little because they added storefronts but left authority untouched. The load-bearing element is the migration of authority, not the software with which the portal is built. Nor is verification a wartime luxury the alliance lacks. Its frontier generates live events: first the Polish night, and then, within weeks, drone closures at Copenhagen and Munich. At the same time, Ukrainian pilots fly as aggressor forces in allied exercises, breaking defenses that self-graded drills would have simply certified.

The two clocks are complements, not rivals. The defenders that night were exquisite and few; the threat was cheap and many. The same logic applies to the chokepoint facilities, concentrated in a handful of buildings from Oberkochen to Veldhoven.

This is because the fast clock defends the slow one: Cheap mass counter-drone and air-defense systems, procured at adaptation speed, are the only kind of economics that closes the gap. And unlike a state-of-the-art bomber, the slow asset's core is not about a system but about building a living error-correction network spanning firms, suppliers, and customer fabs on three continents, defended by every economy that depends on it. The object can be damaged, but the capability regrows.

Everything between these two clocks fails both tests. Whatever Germany can buy, rivals can buy too, and a new purchase invites followers by design. Vacating the middle, however, means renting the equipment, and so it is important to price it rigorously given that it is dependent on the caprice of its owners.

FOUR ACTIONS

First, decision-cycle time should be made a formal NATO alliance metric alongside the percentage of GDP allocated to defense. This should be mirrored in the European Defence Agency's annual review: the elapsed time from a frontline unit observing a new countermeasure to a validated response propagated across allied forces. "Validated" in this case means adopted by units and revealed through procurement pull, not just certified by staff work or approval. This definition matters because it can only be gamed by building the requisite system of signal propagation. The proposal costs nothing, but its effect is deeply structural: What a defensive alliance measures is what its ministries will eventually optimize, and so picking a metric that is relevant for the true constraint is the first step.

Second, the Federal Ministry of Defence, with other willing member states under the European Defence Agency, should establish a two-track procurement system on the split Ukraine has already validated in combat: a marketplace with unit-level purchasing authority and performance-routed funding for the modular, fast-iterating categories (drones, electronic warfare, interceptors, ground robotics), while munitions, missiles, and major platforms stay under centralized industrial procurement, where scale and control remain the relevant discipline.

Rather than attempting to duplicate Ukraine's system, the partners should ratify Ukraine's seat: joint technical standards, European officers embedded in the Ukrainian procurement apparatus, co-production agreements, and Ukrainian aggressor units as the default adversarial test of allied doctrine. The trade-off is the point: Unit-level authority means that bureaucrats lose budget and signing power. Every implementation fight will be fought precisely there.

Third, Germany should initiate at EU level the redirection of sovereignty funding from leading-edge fab subsidies toward deepening the supplier layer it dominates. This should be paired with a statute governing chokepoint use from this point forward: export decisions on these technologies taken under European law, on standardized criteria, with a high bar

that separates genuine security contingencies from routine trade leverage.

The statute cannot nullify another power's extraterritorial rules and should not attempt or pretend to do so. Its functions are threefold: create a European decision point where none exists, halt the ratchet of incremental extensions, and, importantly, over a decade, reduce third-country content in the chokepoint stack. The friction with Washington should be priced openly as an intra-alliance exchange: Germany offers the adaptation metric, the Ukraine integration, and mass defensive production as enlarged contributions and asks in return that allied chokepoints be governed in such a way that common interests align instead of submitting to ad-hoc directives and bullying.

Fourth, the rented middle requires testing optionality instead of blind replication: portability and multi-vendor requirements in public procurement of cloud and model services – and always a European open-source fallback, even if it is one generation behind the frontier. Optionality at trailing capability costs a small fraction of what being at the cutting edge costs, and yet it provides strategic autonomy in the cheapest way possible. Its purpose is deterrence as much as insurance: Whoever blocks frontier model access is negotiating with the people who build the machines their champions depend on. A proven exit option effectively converts coercion into cost: A supplier you can replace can only hand you a bill, while one you cannot replace can choose to hand you an ultimatum.

How far, then, can geotech statecraft carry Germany between partnership and competitiveness?

Exactly as far as the trust its chokepoints have not yet exploited. Statecraft of this kind is a depleting stock. The instrument is therefore most powerful in reserve, and "targeted" use has to be rare, governed, and predictable.

CONCLUSION

Some night early in the next decade, drones will cross a European border again. If the actions this essay proposes are implemented, then the interceptors that rise to meet the incoming enemy drones will cost less than the drones they destroy. And the fix that worked over one border will become alliance doctrine within days instead of years. And when the technology from Oberkochen and Veldhoven becomes a question of export policy, the answer is written in Europe, based on publicly available norms, and defined according to Europe's own sovereignty and interests.

If the actions this essay proposes are not implemented, then Germany goes on funding technology races it cannot win and firing million-dollar rounds at ten-thousand-dollar problems until the trust behind its chokepoints is entirely depleted. The difference between the two scenarios is not about budget because both will cost billions. The difference is the definition of sovereignty: power through position, not merely possession.

Note on the use of AI: Along with keyword search of search engines like google, AI in the form of Anthropic's Claude was used for searching details, sources, and references. It was used partly for brainstorming and testing whether the essay follows the requirement and rules of the competition. AI was finally used to find typos and errors using Grammarly.

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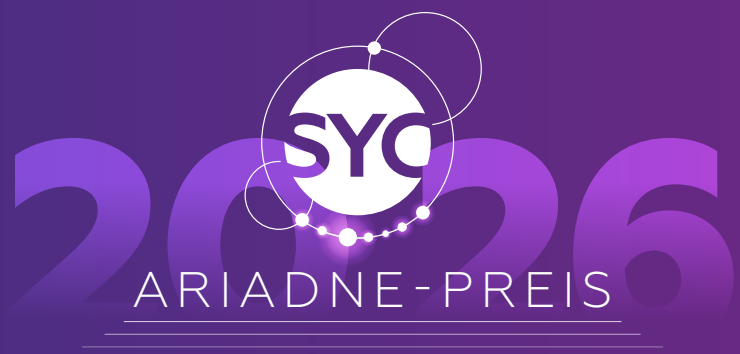

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